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Improving the documentation and classification of gender-research tools: insights from eight thematic reviews

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COVER PHOTO: Participants review orange-fleshed sweet potato variety information and education material on nutrition and orange-fleshed sweet potato. Photo credit: CGIAR

ABOUT CGIAR GENDER EQUALITY AND INCLUSION (GENDER ACCELERATOR):

CGIAR Gender Equality and Inclusion is CGIAR's Accelerator designed to put gender equality at the forefront of global agricultural research for development. The Accelerator will transform the way gender research is done, both within and beyond CGIAR, to kick-start a process of genuine change toward greater gender equality and better lives for smallholder farmers everywhere. gender.cgiar.org.

DISCLAIMER

This working paper has been internally peer reviewed, and the opinions expressed herein reflect those of the authors, not necessarily that of the CGIAR Gender Equality and Inclusion (GENDER Accelerator).

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Abstract

This synthesis paper analyses the landscape of gender-research tools and methods in agrifood systems by bringing together insights from eight thematic reviews developed under the CGIAR Gender Equality and Inclusion (GENDER Accelerator). The analysis highlights the wide range of tools and methods available for gender research in agrifood systems, while also identifying gaps in documentation, classification and dissemination. Drawing on lessons from the synthesis process, as well as a review of metadata best practices, this work underscores the need for clearer terminology, harmonized metadata and more consistent approaches to organizing gender-research tools. It also highlights the importance of adopting standard tagging practices and improving metadata quality and completeness to strengthen the visibility, interoperability and reuse of gender research resources across repositories and platforms. The paper discusses the challenges encountered in curating and categorizing diverse resources and emphasizes the importance of collaboration between researchers and knowledge management specialists to improve discoverability and reuse. The paper concludes with recommendations to strengthen future tool development, tagging and documentation practices to support more coherent, visible and methodologically robust gender research.

1. Introduction

Developing and applying innovative methods and tools is crucial for advancing the quality of gender research and interventions worldwide, helping make them more insightful, inclusive and impactful. The CGIAR GENDER Impact Platform (now the CGIAR Gender Equality and Inclusion (GENDER Accelerator)) has contributed to this goal by synthesizing existing methods and tools, developing new ones, sharing these tools through an online resource hub and communities of practice and providing guidance for gender research across CGIAR and beyond.

While these efforts represent important progress and demonstrate the richness of available gender-research tools across various themes, the process of curating, categorizing and adding these tools and methods to an online resource hub also showed that more work is needed to improve how gender research methods and tools are documented and curated. Challenges included uniformly assessing tool quality, and consistently categorizing and documenting tools and methods across a range of different gender research themes, including agricultural technologies, work and time use, institutions and governance, social inclusion, agricultural value chains, climate change, gender-transformative approaches, and women's empowerment and nutrition. As a result of these challenges, tools, methods and guidance documents are often not shared in repositories typical for research papers and datasets. Researchers, practitioners and policymakers often rely on their networks to learn about resources that could facilitate their work. As a result, many tools that are produced often "sit on the shelf" and efforts to produce new tools and methods can be duplicative.

Enhanced documentation and curation processes would facilitate more effective knowledge exchange and enable a more precise identification of research contributions and gaps, helping ensure that gender research methods and tools are more widely recognized, disseminated and used. In turn, lessons would be easier to share and replicate, and new tool innovation could more deliberately build on existing work to advance the quality of gender research. From a knowledge management perspective, strengthening these processes requires clearer metadata standards, consistent tagging and the use of controlled vocabularies, enabling tools to be systematically organized, easily discovered and more effectively reused across CGIAR and partner institutions.

This paper aims to strengthen the foundation for gender-responsive research in agriculture by synthesizing insights from eight thematic working papers produced under the CGIAR GENDER Platform. Each paper reviews tools and methods relevant to a specific domain of gender research in agrifood systems. By distilling lessons from the synthesis work and identifying best practices for organizing and sharing gender-research tools and methods, this work aims to inform future tool development and better research documentation systems, while also helping to identify critical gaps in existing methodologies and areas in need of further innovation.

The paper is organized into four main sections. It begins with a summary of a literature review that underscores the need for clearer documentation, harmonized metadata, and consistent terminology for gender-research tools. Next, we outline our research methodology, followed by a synthesis of the eight thematic papers. The paper concludes with recommendations to strengthen future tool development, classification, and documentation practices.

2. Literature review: lessons from documenting and curating gender- research tools

As gender research in agrifood systems continues to grow, there is an increasing need to improve how research methods and tools are documented, tested and shared. Clear and thorough documentation not only strengthens transparency and learning within each thematic area but also makes it easier for others to adapt and apply these tools in different settings. Properly tagging resources improves visibility and access and is also important for understanding what each tool is designed to do, how it can be applied, and in which contexts it is most relevant. Without clear classification, it becomes difficult to assess the scope of available tools, identify gaps or support meaningful synthesis across studies.

Harmonized metadata is central to effective and transparent knowledge exchange, particularly when aligned with FAIR (Findability, Accessibility, Interoperability, and Reusability) principles (Wilkinson et al. 2016). Consistent metadata improves discoverability, supports cross-platform interoperability and enables search and filtering functionalities for repositories and model registries (Plaza-Rodriguez et al. 2015; de Alba Aparicio et al. 2018; Haberbeck et al. 2018). Well-curated metadata also facilitates more reliable use of AI tools, which increasingly rely on accurate descriptors to locate, interpret and analyze research outputs (Bandi 2025). Harmonized metadata not only enhances technical interoperability but also reduces duplication, increases institutional memory and ensures that gender-research tools remain findable and usable long after individual projects or staff have moved on.

A central lesson from the literature is the importance of using agreed-upon terminology to describe models, tools and data. Controlled vocabularies—such as AGROVOC, a multilingual thesaurus maintained by FAO—are considered best practice for ensuring semantic consistency and improving automatic accessibility across digital systems (Haberbeck et al. 2018; Simek et al. 2013). Complementing this, effective metadata requires a conceptual framework that captures essential elements of research tools while remaining flexible enough to apply across different methodological traditions (Morsy et al. 2017).

To support broader knowledge sharing, several metadata schemas and standards have been developed. The Dublin Core Metadata Element Set is among the most widely used, comprising 15 elements that describe a broad range of resources, each linked to a uniform resource identifier (URI). While these core elements promote harmonization and interoperability across research fields, they often lack the specificity required by specialized communities. To address this, application profiles have been introduced—customized extensions of existing schemas designed to meet domain-specific needs. The CG Core Metadata Schema, used by CGIAR's CGSpace repository, is one example.

Controlled vocabularies like AGROVOC are often integrated into application profiles. For example, AGROVOC is directly embedded in the CG Core Metadata Schema used by CGIAR's CGSpace repository (CGIAR 2017) enabling users to tag resources with standardized terms and unique URIs. This integration enhances consistency and supports advanced search and filtering across platforms. However, effective use of these vocabularies also depends on users being aware of the standards and receiving adequate training and incentives to apply them correctly.

In addition, the quality of any metadata system ultimately depends on how well resources are classified at the point of entry. Tagging a tool with a broad term like "gender" is insufficient. To enable meaningful reuse and synthesis, metadata should include other thematic tags as

well as more specific descriptors—such as methodology type (e.g., qualitative, quantitative, mixed methods), intended purpose (e.g., data collection, analysis), and scale of application (e.g., individual, household, community, institutional). A more comprehensive, but also more resource-intensive option involves developing a dedicated application profile specifically for gender methods and tools, which would require additional technical expertise and sustained funding to design, implement and maintain while ensuring interoperability with existing metadata standards.

These lessons from the literature directly inform the analytical framework used in this study. In Section 3 we describe the methodology that applies these metadata and classification principles to assess gender-research tools across eight thematic papers.

3. Research methodology

3.1 Analytical framework

This paper examines findings from the eight thematic working papers listed in Table 1, shedding light on the available tools and methods, their characterization and the existing research gaps. Building on established best practices, the framework illustrated in Figure 1—developed by CGIAR gender researchers—served as the basis for curating and categorizing a collection of research tools and methods according to relevant elements across the eight working papers.

Table 1. Thematic working papers

Theme	Link
Agricultural technologies	Tools and methods on gendered design, deployment and evaluation of agricultural technologies
Work and time use	Gendered patterns of work and time use: a review of methods and innovations
Institutions and governance	Gender in rural institutions and governance: a review of existing tools
Social inclusion	A review of social inclusion guidelines, methods and tools
Agricultural value chains	Tools and methods for gender research and integration in agricultural value chain, market and entrepreneurship projects
Climate change	Gender and climate-resilient agriculture: a review of concepts and practical resources in support of gender-transformative change
Gender-transformative approaches	Fostering gender-transformative change for equality in food systems: a review of methods and strategies at multiple levels
Women's empowerment and nutrition	A review of measures and indicators for assessing the relationship between women's empowerment and nutrition

Tool type	Themes	Methodology	Purpose	Scale	Collection
• Framework • Manual • Method • Tool • Toolkit • Training material	• Climate change • COVID-19 • Crops and tecnologies • Institutions and norms • Landscapes and biodiversity • Markets and value chains • Nutrition and health • Women's empowerment	• Qualitative • Quantitative • Mixed-methods • Spatial	• Action research • Analysis • Data collection • Diagnostic • Implementation • Monitoring & Evaluation • Training	• Community • Cross-country • Global • Household • Individual • National • Organization • Regional • Sub-national • Value chain	• Gender and climate-smart agriculture • Gender working papers • Gender-transformative approaches

Figure 1. Gender methods and tools framework – tools

To develop the set of working papers, each writing team curated gender-research tools and methods aligned with their theme, following a shared yet flexible process that supported consistent categorization and documentation of the curated set of tools in an online resource hub. First, writing teams were established and led by one or two researchers with expertise on the topic. The writing teams collected, analyzed and synthesized the various tools, methods, guidance, etc. related to their respective themes. The scope of the syntheses was determined by the writing team members and may have included a specific sub-set of topics within the research theme. The only criterion was that the selected set of topics covered by the synthesis should relate to high-priority impact areas and initiatives of CGIAR. Writing teams used different approaches to gather tools and methods, including literature reviews, searches of existing CGIAR materials and consultations with gender researchers within and outside CGIAR.

Writing teams were also expected to consider what aspects of the research theme were lacking in quality or quantity of appropriate methods and tools, and whether there are any important ethical issues to consider in relation to these tools and methods used for the research area (e.g., with data collection, project implementation). The syntheses also considered the extent to which the tools and methods were used (or could be used) to examine intersectional identities as well as how the tools may have evolved with the introduction of new digital or ICT technologies.

The final set of tools and methods were curated based on their quality (defined by the writing team) and included in an appendix of the synthesis working paper. These tools were tagged according to criteria shown in Figure 1 and entered into an online database of tools and methods (resource hub) to increase visibility and access to these tools. The intended audience for these tools spans a wide range of users and tool purposes. This stepwise process underscores the importance of applying consistent metadata standards and controlled vocabularies at the point of entry, since early alignment improves tagging accuracy and reduces downstream inconsistencies when tools are integrated into shared repositories.

To produce this synthesis, we reviewed all eight thematic working papers and discussed the approaches each team used to identify, curate and categorize gender-research tools within their respective themes. We used a narrative synthesis approach that involved reading each paper in detail, extracting descriptions of how tools were gathered and classified, and comparing commonalities and differences across themes. For each paper we assessed several issues: 1) the relevance of the tools and methods for advancing gender research on the topic; 2) the scope of the review which determined the types of tools and methods available for the theme (and gaps that were identified); and 3) challenges in the process

of curating, tagging and disseminating the tools collected for the theme. This assessment allowed us to identify shared challenges, gaps and patterns in the documentation and use of gender-research tools. The synthesis presented in the next section reflects this comparative review process and highlights where greater consistency, clearer terminology and stronger metadata practices could improve future curation efforts.

4. Results from eight thematic reviews

This section brings together key insights from eight thematic reviews developed under the CGIAR GENDER Platform. These thematic reviews offer a broad overview of gender-research tools and methods across key domains in agrifood systems. Each paper explores a distinct area highlighting the types of tools available, how they are used, and the methodological approaches behind them. These thematic reviews provide a foundation for understanding the diversity and availability of gender-focused tools and methods, and how they can inform future research, strengthen program design, and support more inclusive policy engagement.

4.1 Theme 1: Agricultural technologies

In Tools and methods on gendered design, deployment and evaluation of agricultural technologies, agricultural technology is defined as "any technical solution, tool, equipment or management practice applicable across agricultural or aquacultural value chains or food systems" (p.2). Two classification frameworks were applied: one for outputs that developed new gender tools (such as frameworks, guidelines and methods), and another for analytical studies that used data collection and analysis methods to assess interventions and programs. This distinction helped separate stand-alone innovation products from evaluations, impact assessments and adoption studies of interventions.

Tools and analytical studies were collected through open calls to gender and CGIAR networks, as well as keyword searches in databases such as Google Scholar, using combinations of terms related to gender, agriculture and specific terms such as tools, technology, mechanization, crop breeding, livestock, aquaculture, ICT, irrigation, postharvest, impact and adoption.

While in the initial framework (Figure 1) "tools" and "methods" were treated as sub-categories of "tool type," in this paper the authors used these terms more broadly to describe the entire set of approaches, sometimes alternating methods with methodology. For "tool type," they instead introduced more specific designations such as guiding questions and assessment methodology.

The writing team also grouped tools by innovation cycle stage—priority-setting, research and development, extension, adoption, and evaluation. This classification added structure and helped illustrate where different types of tools are being used, but it is not clear whether it actually makes the resources easier to find or use, given that most tools addressed multiple stages. On the other hand, classifying tools by technology area—like crop improvement, livestock feeds, or irrigation—seemed directly relevant for people looking for resources tied to specific sectors or applications. It could be useful to see how different audiences respond to these ways of organizing information.

The authors also included classifications by audience and by country or region. Identifying the intended audience of each tool or study, however, proved to be complex. In many cases, descriptions overlapped across user groups or were too broad to allow clear differentiation (e.g., "various actors" or "development practitioners"). Nonetheless, mapping audiences remains important for understanding potential uptake pathways. While categorizing by

audience type can be ambiguous, classifying resources by country or region is highly relevant, as it helps situate tools within specific agricultural, institutional, and socio-cultural contexts.

Analytical studies were classified by type of study and methodological approach (quantitative, qualitative, or mixed methods), consistent with the original framework and particularly useful for researchers with different areas of expertise to identify relevant resources.

4.1.1 Data description

Eleven tools and forty analytical studies made the final cutoff. Detailed descriptions of assessed tools and studies can be found in the online annex. About half (5) of the identified tools were categorized as an assessment methodology while two of the resources provided guiding questions, two were training manuals and two were decision support tools (Table 2).

Most tools focused on priority-setting and evaluation stages of the innovation cycle, with some addressing multiple stages. Of the tools reviewed, four targeted crop improvement and seed delivery technologies, while six did not focus on any specific technology. These tools were implemented in thirty pilot projects, the majority of which occurred in Africa (25), particularly in Nigeria (6).

Most analytical studies focused on crops and a variety of data collection methods using qualitative, quantitative and mixed method approaches.

Table 2. Types of tools, innovation cycle stage and technologies

Tools type	Number	Innovation-cycle stage	Number	Tools by technology	Number
Assessment methodology	5	Priority-setting	8	Crop improvement and seed delivery	4
Guiding questions	2	Research and development	4	Any crop or livestock product	1
Training manual for practitioners	2	Extension	2	Livestock feeds	1
Decision support tool	2	Adoption	4	Small-scale irrigation	1
		Evaluation	6	Mechanization	1
				Any technology	6

Note: Responses for innovation cycle stage and technology type were not mutually exclusive.

4.1.2 Research contribution and gaps

For each stage of the innovation cycle, tools and studies were evaluated to determine the extent to which they integrate gender considerations into their design and findings, as well as to identify areas for improving gender analysis. A key gap identified was the lack of detailed information on how tools complement one another across different stages of the innovation cycle.

Additionally, some tools lacked clarity on sampling data collection procedures, such as specifying who within households should be interviewed, which could result in underrepresentation of women in male-headed households.

Classifying technologies by type helped reveal which areas are well supported by gender innovation tools and which require more attention. This research found a lack of tools and studies that addressed livestock, agroforestry, aquatic species and commodities, chemical inputs such as fertilizers and pesticides, and digital technologies. Intersectional analysis

of data seemed to be missing in many studies, which could lead to the development of tools that are not relevant to certain groups or that can cause harm to vulnerable women and men. Most tools and analytical studies also did not address all the three dimensions of gender transformative change: individual capacities; social relations; and institutional structures, norms and practices. While many tools considered the first two domains of individual capacities and social relations, few also addressed institutional structures, norms and practices.

4.1.3 Challenges in the process of curating, tagging and publicizing the tools collected

This work notes several practical challenges in curating and documenting the tools and studies. Even with broad searches and open calls, few relevant tools were found, showing that gender-intentional resources for agricultural technologies remain limited and dispersed. This scarcity may also reflect how existing tools are stored or described, possibly they might not be well catalogued, lack consistent metadata, or are embedded within project reports rather than published as independent, searchable resources. It was also difficult to align the tools with specific stages of the innovation cycle, since several overlapped multiple stages or did not clearly describe their purpose. The variety in format, terminology and level of detail further complicated the process of organizing and tagging the tools. In some cases, the tools had been tested and published, while others were still in draft or internal versions, making it hard to assess their actual use. These challenges underscore the need for standardized metadata practices, clearer tool definitions, and the use of controlled vocabularies so that agricultural technology tools can be systematically classified, easily discovered and effectively integrated into shared knowledge repositories.

4.2 Theme 2: Institutions and governance

In the study, Gender in rural institutions and governance: a review of existing tools, institutions were defined as "systems of formal and informal rules that shape human interaction" (p.6) while governance "refers to how [formal and informal] power and authority are used to manage the collective affairs of a community, society, nation or country" (p.6).

According to the authors, the scope of the research was limited to documents that presented a methodology, guidance or set of questions for measuring or promoting women's empowerment and good governance. Therefore, research that disseminated evidence without providing clear guidance on how to collect data or conduct gender research was not included.

Tools were classified by strand of research, methods, types, gender focus, intersectional, level, sector/theme, and aspect of governance/institutions covered (foci) as shown in Table 3. This classification enabled authors to perform a series of cross tabulations to identify research gaps in different areas.

For tool type, the authors used more specific terms, leaving out broader categories such as "methods" and "tools" because they were considered too general. However, they also combined elements that represent both tool type (e.g., framework, toolkit) and purpose (e.g., data collection, monitoring and evaluation) from the original framework, bringing them all under a single "tool type" category. While this approach may have helped researchers organize different types of resources, it also created some confusion by mixing categories that serve different functions. For instance, "data collection" refers to a process rather than a tool type. Redefining terms in this way makes classification less intuitive for users and less interoperable across studies, underscoring the importance of consistent terminology. In contrast, the classification by intersectionality and governance level is particularly valuable, as it highlights how gender and social dynamics vary across groups and institutional scales. By capturing overlapping factors such as age, education, ethnicity and socio-economic status, and distinguishing between national, community and household levels, this approach not only deepens the analysis but also helps users identify and locate resources relevant to specific contexts and populations.

4.2.1 Data description

A total of 69 tools were assessed. The complete list of tools and classification can be found here.

Studies used quantitative (30%), qualitative (29%) or mixed (41%) methods. Data collection tools were the most common type of tool (48%) followed by implementation guides (32%). In terms of intersectionality, most tools included a focus on ethnicity (57%) and in terms of the level or scale, most tools were developed for the community level (71%). The most common theme was natural resource management (43%) followed by political engagement (29%). Participation in groups was the aspect of governance or institutions (foci) the tools mostly addressed or measured (58%) (Table 3).

In terms of research strands, 90 percent addressed the question of how gender shapes institutions and governance while 49 percent investigated how institutions and governance differentially benefit men and women. Gender was the primary focus of 72 percent of the studies, while 22 percent considered gender even though it was not the primary focus. The remaining 6 percent of studies were not designed to address gender issues but could be applied to gender research.

Table 3. Tool classifications

Sector/theme	%	Intersectionality	%	Foci	%
Agriculture and markets	14	Age	42	Access to resources	16
Climate change	3	Education	33	Access to services	7
Laws and regulations	9	Ethnicity	57	Agency	10
Multistakeholder processes and platforms	9	Socio-economic status	35	Collective action	14
Natural resource management	43	None	38	Equity	16
Nutrition	1	**Level of institutions or governance**	**%**	Inclusion	19
Payment for Environmental Services	3	All levels of government	12	Leadership	20
Political engagement	29	National	23	Participation in groups	58
Social networks	17	Sub-national	26	Policy assessment/ reform	16
Water, sanitation and health	3	(Stakeholder) Group	9	Political participation	30
Type	**%**	Community	71	Project self-assessment	14
Data collection	48	Community organizations	6	Rights/tenure	16
Framework	16	Household	9		
Implementation guide	32	**Methods**	**%**		
Participatory implementation guide	17	Mixed	41		
Monitoring and evaluation	0	Qualitative	29		
Toolkit	6	Quantitative	30		

Research strands addressed	%
a. how does gender shape institutions and governance and how can gender-responsive governance be achieved?	90
b. do institutions and governance differentially benefit men and women, or both simultaneously?	49

Note: Categories per topic are not mutually exclusive

4.2.2 Research contribution and gaps

This research conducted multiple cross-tabulations between the topics outlined in Table 3 and the two research strands, examining the extent to which methods and tools were effectively represented and identify research gaps. A significant gap was found on the research strand of "assessing how institutions and governance impact women and men differently" as a much larger number of tools addressed how "gender affects institutions and government". Some themes also had a lower number of methods and tools compared to others including climate change; payment for environmental services; nutrition; and water, sanitation and health.

Several other disparities emerged. For instance, studies about political engagement were mostly quantitative, while natural resource management studies were balanced between mixed methods and qualitative. Community-level tools employed mostly qualitative and mixed-methods approaches, while household studies were more quantitative. Quantitative methods appeared to be underrepresented in the tools aimed at evaluating how institutions and governance impact both women and men. Pure quantitative methods were not present in most sectors, except for political engagement and social networks. In turn, natural resources management stood out for having a balanced number of qualitative and mixed-methods studies. As for foci, participation in groups had the most mixed methods, while political participation studies were mostly quantitative. Studies that addressed intersectionality were mostly qualitative or mixed methods.

The analysis and categorization of methods and tools provided a clear basis for identifying research gaps across the two strands, highlighting areas where certain methods or tools are underrepresented. The complete cross-tabulation results and detailed findings are available in the working paper.

4.2.3 Challenges in the process of curating, tagging and publicizing the tools collected

Many tools were not well documented or were not published in conventional academic outlets. As a result, a substantial portion of the collection process relied on outreach to experts and follow-up with tool creators to obtain materials, complemented by snowball sampling and online searches. This approach broadened coverage but remained uneven, yielding stronger representation of CGIAR-linked resources and fewer tools from other institutions or disciplines. The lack of standard indexing and formal repositories further complicated identification, as most tools were available only in gray literature or on organizational websites, making them difficult to locate and verify

Once identified, tagging and classification also proved complex due to the diversity of tool purposes and structures. The authors had to develop custom typologies to distinguish between frameworks, data-collection instruments and implementation guides, which led to some conceptual overlap. Some tools functioned simultaneously as diagnostic frameworks, participatory methods and monitoring instruments, complicating efforts to assign consistent metadata. Moreover, even when available online, tools were often poorly publicized or not easily searchable, reinforcing the need for a curated and standardized repository to improve discoverability and use across research and policy communities. These challenges highlight the need for shared metadata standards, clearer tool-type definitions, and dedicated knowledge management workflows so that institutional and governance tools can be consistently catalogued, easily retrieved, and integrated into interoperable systems rather than remaining scattered in gray literature.

4.3 Theme 3: Work and time use

The review on Gendered patterns of work and time use: a review of methods and innovations focused on data collection tools and methods used to assess gendered work and time use. Accurate measurement of paid and unpaid work, including time spent on various activities, is essential for recognizing and valuing the contributions of both women and men.

Quantitative methods included household surveys to measure gendered rural employment, as well as time diaries and stylized questions to capture time spent on unpaid and paid activities. Qualitative approaches, such as direct observation, personal interviews and focus group discussions, were also evaluated.

In this study, the authors focused on one dimension of the analytical framework presented in Figure 1—the methodological approach—distinguishing between quantitative and qualitative methods and subsequently discussing methodological issues and gaps. This approach made sense because the resources assessed were all data collection tools.

In applying the original framework to the online annex (the dataset (xlsx file)), however, the classification proved difficult to maintain because all resources were data collection tools. To address this, the authors added a new category labeled "sub-type", roughly corresponding to the "purpose" category in Figure 1, but combining diverse elements such as "diagnostic" "action research", "data collection", "analysis", and "toolkit". As these terms reflect different analytical dimensions, grouping them together made it difficult to interpret or compare resources consistently. Ideally, data collection would have remained the main category, with clearer subcategories under it to improve consistency and findability.

4.3.1 Data description

The primary tools for measuring rural gendered work and time use are summarized in Table 4. Labor-force surveys (LFS) and agricultural surveys are key quantitative methods for collecting household data on rural work. In addition to national LFS, multitopic living standards surveys (MLSS), such as the Living Standards Measurement Study (LSMS) and Integrated Household Panel Survey (IHPS) also collect data on labor markets. Agricultural surveys gather data on rural households, agricultural holdings, labor and, occasionally, time use. One example of such agricultural surveys is the FAO's Agricultural Integrated Survey (AGRIS), which collects data on rural work and time use.

Time-use data collection is usually done using time diaries (self-reported or interview-based information about all activities in a period of time) or stylized questions (respondents report on total time spent on specific activities during a reference period). An example of the use of stylized questions is the labor and time-use module of the LSMS-ISA survey. Time-use surveys can be stand-alone surveys or part of a larger survey. The project-level Women's Empowerment in Agriculture Index (pro-WEAI) time-use module is an example of an interview-based time diary.

Qualitative methodologies are an important part of gender research as they investigate the different contexts such as the social norms and beliefs that shape the gender roles in agricultural settings. Tools such as personal interviews and focus group discussions help to provide nuanced discussions on gender and other intersectional identities. Mixed-method studies combine and bring the strengths of both qualitative and quantitative methodologies.

Table 4. Data collection tools used to measure rural gendered work and time use

Methodology	Goal	Tools
Quantitative	Measure rural women's work	• Labor-force surveys • Agricultural surveys
	Measure time use	• Direct observation • Time diaries • Stylized questions
Qualitative	Explore cultural and contextual differences in social beliefs and practices that influence gendered patterns of work and time use	• Diagramming or mapping tools • Participatory rural appraisal tools • Interview techniques • Ethnographic tools
Mixed methods	To draw on the strengths and complementarities of both qualitative and quantitative research methods	• A combination of quantitative and qualitative tools

4.3.2 Research contribution and gaps

This review highlights several contributions and innovations in methodologies for collecting gendered data on rural work and employment. Time-use surveys have progressed beyond simply tracking the hours and minutes spent on various activities. They now incorporate additional dimensions, such as individuals' preferences and perceptions about the division of labor within households. Innovations such as digital data collection via mobile phones, phone-based rapid labor surveys, big data analytics, and leveraging social media are being explored to deepen insights into rural gendered work.

The categorization of research by methodology helped to identify and assess challenges specific to quantitative or qualitative tools. One of the findings was that data collection tools such as some traditional LFS have not yet fully incorporated all types of unpaid and paid work performed in rural settings, which can lead to an underestimation of work in agriculture and households. Recall bias was seen as a risk for time-use surveys as respondents might not accurately recall all activities they performed in a reference time. Reporting by proxy could lead to under reporting of work and employment activities. Inconsistencies in activity classification, along with ambiguity surrounding distinctions between work and employment, as well as care and domestic work, can result in underestimations of certain types of labor.

Greater attention is needed in the conceptualization and measurement of data collection, moving beyond tracking time spent working to consider factors like women's empowerment and agriculture-nutrition linkages. Additionally, more rigorous studies should assess the effectiveness and scalability of smartphone- and sensor-based data collection methods, as well as the potential of big-data approaches.

4.3.3 Challenges in the process of curating, tagging and publicizing the tools collected

Challenges in the process of curating and tagging the tools included maintaining a consistent classification. Because most resources were data collection tools, categories often overlapped or mixed different purposes, making it difficult to distinguish among them. A more systematic approach would treat data collection as a main category, with relevant sub-categories such as survey instruments, time-use diaries, and participatory tools. While the paper does not describe specific challenges in identifying resources, the dispersed nature of methodological

tools across repositories and publications suggests that locating and consolidating them may require additional effort. These challenges point to the need for standardized metadata fields, clearer sub-categories, and dedicated knowledge management practices to ensure that time-use and labor tools are consistently documented, easily searchable and integrated into interoperable repositories rather than dispersed across disconnected sources.

4.4 Theme 4: Climate change

The review Gender and climate-resilient agriculture: a review of concepts and practical resources in support of gender-transformative change uses the concept of climate-resilient agriculture, which is defined by the authors as processes that support and enhance resilience in agrifood systems. They note that addressing gender inequality in agrifood systems is both a means to increase resilience as well as an outcome. Thus, addressing gender inequalities in the impacts of climate change and in capacities to respond to climate change through climate-resilient agriculture would lead to more sustainable, resilient, inclusive and equitable agrifood systems.

The paper gathers and curates a set of "practical resources" including gender and climate-resilient agriculture tools/methods used by researchers as well as guidance documents that support gender integration in climate-resilient agriculture policy or programming, drawing on a literature review and stakeholder survey. These practical resources are then assessed based on their possible application, focus, gender approach (gender responsive or gender transformative), usability, accessibility and scientific quality. These resources are further evaluated for their consideration of intersectionality and for any quality or ethical issues that may arise during their use. Academic papers offering conceptual and methodological insights are referenced, where relevant.

The study grouped resources into three broad categories—tools, methods and guidance—but did not further classify them by specific tool type, such as frameworks, toolkits, manuals or training materials. While this simplified typology helped distinguish between practical and conceptual resources, it also limited the level of detail needed for users to easily locate or compare similar materials. In addition, some guidance documents were working papers with policy recommendations, reflecting a broad interpretation of what constitutes a guidance resource. This diversity across topics and formats made it difficult to apply a uniform classification, limiting the level of detail needed to improve findability and usability.

4.4.1 Data description

This paper reviewed a total of 44 practical resources, comprising 16 tools and methods, as well as 28 broader guidance documents. Among these, resources focused on mapping vulnerability and resilience were the most prevalent, followed by those aimed at identifying opportunities and barriers for climate-resilient agriculture innovation (Table 5). Eleven resources used quantitative methods and 10 used mixed methods with participatory resources. Other resources were participatory (5), mixed methods (5) and qualitative (4).

Most resources (89%) were classified as gender responsive, while 9 percent were on the border between gender responsive and gender transformative and only 1 resource was considered fully gender transformative.

Table 5. Focus of practical resources (n=44) and type of methodology

Focus	#
Mapping vulnerability and resilience	11
Opportunities and barriers to CRA innovation	9
Appraisal of specific CRA practices;	8
Assessing CRA outcomes of processes and interventions	6
CRA agricultural innovation systems	5
Context and enabling environment	4
Transformational approaches	0
Anticipatory tools—foresight and scenarios	0

Methodology	#
Quantitative	11
Mixed methods with participatory resources	10
Participatory	5
Mixed methods	5
Qualitative	4

4.4.2 Research contributions and gaps

The review highlights gaps in the current availability of methods and tools for gender analysis in climate-resilient agriculture, alongside recommendations to address them. One important gap is the lack of resources that support transformative change at systemic levels. While many tools focus on household- and community-level interventions, few engage with broader policy, institutional or governance structures. To address this, future resources should be designed to facilitate engagement with national and global policy processes, enabling researchers and practitioners to influence structural reforms that underpin gender inequality in agriculture.

Another key gap is the limited integration of intersectionality. Most resources fail to adequately explore how overlapping identities—such as gender, age, ethnicity and disability—interact with systems of power and shape experiences of climate vulnerability. New tools should incorporate diverse lived experiences. This would enhance the relevance and effectiveness of climate-resilient agriculture interventions, particularly for marginalized groups.

The review also notes a scarcity of digital and interactive tools. Most existing resources are static documents, which may limit accessibility and user engagement. Expanding the use of digital platforms, interactive learning modules and spatial mapping technologies could improve usability and reach.

Sensitive and underexplored themes, such as gender-based violence, climate security, conflict and migration, are largely absent from current climate-resilient agriculture resources. Given the growing relevance of these issues in climate-affected regions, there is a need to develop tools that address them explicitly. Developing these tools includes creating resources that help practitioners navigate complex social dynamics and mitigate risks associated with climate-induced displacement and violence.

Finally, the review identifies a lack of documentation about the uptake, adaptation and impact of existing resources. Few tools provide evidence of how they have been used or their influence on policy and practice. To strengthen learning and accountability, future resource development should include mechanisms for monitoring and evaluation, as well as opportunities for feedback and iterative improvement. Collaborating with civil-society organizations and local stakeholders can also ensure that new tools are demand driven, contextually relevant and aligned with the needs of those most affected by climate change.

4.4.3 Challenges in the process of curating, tagging and publicizing the tools collected

The authors identified several challenges that can affect resources' findability and usability. Many resources lacked clear information about their intended purpose, audience or methodological approach, making consistent tagging and classification difficult. The quality and level of detail also varied widely, with some tools providing only brief descriptions or omitting key definitions and assessment criteria, which reduced comparability across resources. Broken links and the limited availability of online or digital formats further constrained accessibility and visibility. Moreover, the diversity of topics and document types—ranging from toolkits and training manuals to working papers and policy notes—made it difficult to apply uniform categories or metadata.

In addition, some of the working papers included policy recommendations, reflecting a broader interpretation of what constitutes a guidance document. While some papers incorporated explicit guidance notes and others did not, the diversity of tool types across topics further complicated efforts to apply a uniform categorization. Standardized metadata fields, controlled vocabularies, and clearer knowledge-management workflows would make it easier to consistently document, cross-reference and integrate climate-resilience resources into searchable repositories rather than remaining scattered and difficult to compare across formats and contexts.

4.5 Theme 5: Social inclusion

In A review of social inclusion guidelines, methods and tools, the authors define social inclusion as the process of improving the terms of participation in society, whereby the poorest, most vulnerable, and marginalized groups of society become the main decision-makers in projects that affect them and participate in all stages of intervention's cycles.

Research outputs were reviewed considering how social inclusion was conceptualized, adherence to key principles, inclusive knowledge production, processual aspects and gaps and strengths of the resources. They were then categorized by type, including policies, guidelines, tools, toolkits, frameworks, briefs and manuals. The outputs were also categorized by project cycle, focus, focal region, audience and methodology. Classification by specific focus proved to be a highly effective approach for identifying the population groups targeted by social inclusion methods and tools. The authors assessed whether resources focused on general social inclusion or specific dimensions such as gender equality and social inclusion (GESI), disability, caste, youth, LGBTQI+ inclusion or Indigenous Peoples.

The classification of the resources by type—such as guidelines, frameworks, toolkits, tools, briefs, manuals and policies— provided a useful overview of the range of materials available. However, it combined resources of different natures and purposes, grouping conceptual frameworks and methodological toolkits with formats like briefs, manuals and policy documents. This increases the challenges of accurately tagging and describing resources in metadata, which is essential to improve their organization, visibility and reuse.

In turn, the specific focus on less-addressed dimensions of social inclusion—such as disability, caste, ethnic minorities and LGBTQI+ groups—is particularly valuable, as it helps fill documentation gaps and improve the visibility of resources that are often harder to identify and curate. The relevance of this focus extends beyond social inclusion studies, supporting broader efforts to organize, document and make diverse knowledge resources more accessible across research domains.

4.5.1 Data description

This review identified and assessed 43 resources. Guidelines were the most common resource type (13). The most common methodology was qualitative (27) while 10 resources were mixed methods, and none were quantitative. Most studies had no specific geographic focus with the remaining ones focusing on the Asia–Pacific region or Africa. Studies were also classified by target groups (Table 6). However, almost half of the studies (20) did not provide enough details on how to address social inclusion issues of specific groups.

Table 6. Classification of studies

Resource type	#	Specific focus	#	Methodology	#
Policy	2	Disability	3	Qualitative	27
Guideline	13	Caste	3	Mixed methods	10
Tool	5	LGBTQI+	3	Quantitative	0
Toolkit	6	Indigenous people and ethnic minorities	8	Not classified	6
Framework	3	Intersectionality	2	**Focal region**	**#**
Brief	2	Youth	1	Global/non-specific	25
Manual	2			Asia–Pacific	10
Other	10			Africa	8

Overall, the target audience was primarily development practitioners. For the 14 resources developed by CGIAR institutions, the audience was mainly CGIAR researchers and National Agricultural Research Institute (NARI) partners, with the focus being stakeholder identification and engagement. Across the project cycle, 26 resources covered all stages. Meanwhile, 10 resources concentrated on intervention design, eight targeted implementation, and only two focused predominantly on monitoring and evaluation. Participatory approaches are mentioned in most documents; however, few provide detailed definitions or typologies of participation. Only 13 studies mention the importance of addressing language issues while four mention sign-language interpretation.

4.5.2 Research contribution and gaps

This research highlighted several challenges in developing and operationalizing methods and tools. A key issue is the lack of a shared understanding and consistent definition of social inclusion and GESI, which complicates efforts to establish a unified approach to social inclusion.

The conflation of gender equality and social inclusion has resulted in greater focus on gender issues, often overshadowing other aspects of inclusion. Additionally, intersectionality within gender analysis is frequently absent, masking disparities among sub-groups of women. To effectively address social inclusion with its full intersectionality, interventions must adopt a systems-based, multidimensional approach that acknowledges the interconnected and interdependent nature of social, economic, cultural, environmental and political systems.

Limited resources were found on adverse inclusion, which happens when projects aimed at increasing inclusion do not consider social and local contexts and end up marginalizing more vulnerable communities. Though most social inclusion studies call for the identification of the poorest, vulnerable and marginalized groups of society, many do not give specific guidance on how to identify excluded individuals and groups in different contexts.

Some studies recommended the use of participatory approaches to identify target groups. Indeed, reducing social exclusion requires incorporating participatory approaches

throughout the entire intervention cycle. However, such approaches may fail to foster inclusivity if they are not designed to be inclusive themselves, exclude vulnerable groups, or disproportionately involve participation from more powerful groups.

The study recommends developing tools and methods to assess social inclusion in agri-food systems, emphasizing well-being beyond economic measures to address discrimination, power imbalances and other exclusionary factors. It calls for integrating scientific, local and Indigenous knowledge, creating ethical and inclusive research frameworks, and establishing a CGIAR-wide social inclusion strategy aligned with gender strategies. Further priorities include improving monitoring and evaluation systems for inclusive processes and outcomes, and coordinating researchers' efforts to build shared, aligned resources.

4.5.3 Challenges in the process of curating, tagging and publicizing the tools collected

The process of documenting and curating resources on social inclusion presented some challenges that can affect the findability and usability of the collection. First, differences in how organizations and institutions define and operationalize social inclusion meant that relevant materials were often scattered across disciplines and repositories, making them difficult to locate through keyword searches. The diversity of institutional policies and terminologies limited the effectiveness of standardized search terms, while the conflation of social inclusion and gender equality in many publications created overlaps and inconsistencies in scope. In addition, the scarcity of resources specifically focused on agriculture and food systems required expanding the search to broader development literature, which introduced further variation in focus and format. Limited responses to outreach efforts and the small number of publicly available, well-documented tools also constrained the comprehensiveness of the review. These factors highlight the need for clearer conceptual boundaries, harmonized terminology and improved metadata systems to strengthen the findability and curation of social inclusion resources in agri-food research.

4.6 Theme 6: Gender-transformative approaches

The paper, Fostering gender-transformative change for equality in food systems: a review of methods and strategies at multiple levels, examines how gender-transformative approaches are being applied in agri-food systems research and development. The gender-transformative approach "refers to an approach in development or R4D that is intentionally oriented, facilitated and applied with the aim of examining, challenging and transforming the underlying causes of gender inequality". It focuses on approaches that aim to shift the structural causes of gender inequality, such as norms, policies, and institutional systems.

The paper categorizes gender-transformative methods and strategies across three levels: (1) local (households, groups, communities); (2) meso and macro (markets, states, societies); and (3) intraorganizational (within research and development institutions).

It examines how these methods function, how they address intersectionality, accessibility and scalability, and how they can be applied across different stages of a project cycle (design, implementation and evaluation). The paper also introduces a framework for scaling gender-transformative change in three directions: "out" to more communities, "up" to influence systems and policies, and "in" to transform implementing organizations themselves.

Twenty illustrative examples of gender-transformative methods and strategies are assessed and selected with the purpose of ensuring diversity and representation across local, meso–macro and intraorganizational levels.

The paper did not group tools by type, such as frameworks, toolkits or manuals. Instead, it organized gender-transformative approaches around key principles, levels of intervention and enabling factors for change. This thematic focus helps illustrate how different approaches

work in context, but it offers less guidance for tagging or comparing individual tools in ways that would make them easier to organize and apply.

4.6.1 Data description

At the local level, 13 methods were examined, categorized by their role in the project cycle: formative (e.g., GENNOVATE, gender analysis); catalytic (e.g., household methodologies, community theater, technical training); and measurement (e.g., gender norms scales, outcome mapping). These methods focus on shifting informal structures like gender norms and often rely on participatory, dialogic processes. While many are accessible and scalable, the review notes limited attention to intersectionality.

At the meso and macro levels, the paper identifies strategies aimed at transforming formal and semiformal systems. These include policy reforms (e.g., feminist foreign policy), redesigning data systems to address gender bias, restructuring financial systems and using ICTs and media to challenge norms. These strategies are less developed than local-level methods and face challenges related to political will, institutional capacity and evidence of effectiveness.

At the intraorganizational level, the paper reviews approaches that aim to shift internal norms, cultures and systems within R4D organizations. Examples include the Gender at Work framework, gender capacity development models and staff reflection processes. These methods emphasize internal change as a foundation for external credibility and effectiveness but are less widely applied and documented.

4.6.2 Research contribution and gaps

This paper presents a review of gender-transformative methods and strategies in food systems, highlighting how these approaches are being applied across local, meso–macro and intraorganizational levels. By organizing the examples according to their function in the project cycle and their level of application, the paper provides a practical framework for understanding how gender-transformative change can be pursued in diverse contexts. It also introduces additional lenses—intersectionality, accessibility and scalability—for assessing the potential of these approaches to contribute to systemic change.

Despite these contributions, the review identifies several gaps. There is limited documentation on how intersectionality is operationalized in practice. Strategies at the meso and macro levels remain underdeveloped, with challenges related to political will, institutional capacity and evidence of effectiveness. Intraorganizational methods are also less widely applied and documented, despite their importance for enabling external credibility and impact. The authors recommend investing in multilevel, coordinated efforts to scale gender-transformative change “out” to more communities, “up” to influence systems and policies, and “in” to transform the internal cultures of implementing organizations.

4.6.3 Challenges in the process of curating, tagging and publicizing the tools collected

The authors noted that information on intersectionality, accessibility and scalability was often missing or unevenly presented, constraining efforts to synthesize and tag materials in a standardized way.

Moreover, because the paper organized approaches thematically rather than by tool type, it was more difficult to tag and compare specific tools across studies. While such organization is relevant to the specific topic being investigated, when considering gender methods and tools more broadly, it is important to adopt a classification system that applies across different themes to improve consistency, comparability and findability of resources. Common metadata fields, harmonized tool-type taxonomies and structured knowledge-management workflows would ensure that gender-transformative approaches can be systematically documented, interoperably classified and easily retrieved across repositories despite their thematic diversity.

4.7 Theme 7. Agricultural value chains

While the review, Tools and methods for gender research and integration in agricultural value chain, market and entrepreneurship projects, searched for tools across these broad set of topics (value chains, market inclusion and entrepreneurship), it identified only tools and methods related to gender and agricultural value chains. The analysis considered tools and methods designed to integrate or operationalize gender equality and women's empowerment within these processes, identifying how they define key concepts, how these are measured and where they are applied across value chains and project cycles.

4.7.1 Data description

Nineteen resources with tools and methods related to gender and agricultural value chains were identified. Fourteen resources are practical resources for implementation and five resources are analytical research resources. Correspondingly, sixteen resources have practitioners as a target audience and seven researchers, students and academics (four also target practitioners). Only one resource also targets policymakers and one private sector.

Sixteen resources are categorized by type as a framework/approach, nine as a tool, six as a method, five as a toolkit and two as training material. Several resources are classified as a combination of these. Most of the tools are frameworks/approaches that combine diagnostic, implementation or monitoring and evaluation functions. Ten resources apply qualitative methods, seven resources are mixed (qualitative and quantitative) methods.

Because resources were not consistently assigned to a single category, there were classification challenges. For example, one resource was labeled simultaneously as a Framework, Diagnostic, Implementation Guidance, a Monitoring and Evaluation tool and a Toolkit, making the categorization process messy. Each resource should have a primary category to improve metadata consistency, organization and overall usability.

Most resources primarily focus on the production node, specifically on smallholder producers, with fewer resources addressing processing, trading or retail segments. Fourteen resources focus on the value chain as the unit of analysis, while also collecting data at the scale of individuals and households. Six resources consider organizations as the unit of analysis and three resources consider communities (in addition to value chains).

Nearly all identified resources include gender analysis as either the main goal or as a means to identify strategies to reduce gender inequalities, increase women's participation, and/or empower women in value chains. Some resources seek to understand how value-chain development processes impact gender roles, relations and/or inequalities. The main audience is development practitioners while private sector and policymakers are likely to be important target audiences.

Most tools and methods have been piloted in a few countries, primarily in African countries, Asia (Bangladesh mainly) and some Latin American countries. Yet, all but one are applicable globally.

4.7.2 Research contributions and gaps

This synthesis highlights most available tools provide frameworks and methods for integrating gender within agricultural value chains; however, several gaps remain. There are a lack of tools and methods that address gender in the context of market inclusion and entrepreneurship, revealing a major area for future research and tool development. Many of the identified tools focus primarily on the production node of the value chain, giving less attention to processing, trading and marketing stages, where gendered power relations and opportunities also play important roles. Furthermore, the majority of tools take a single-commodity approach, overlooking the fact that most rural households rely on diversified livelihoods. This narrow focus limits understanding of how engagement in one value chain affects participation in others or overall well-being. Another critical limitation relates to the competencies required to apply these tools effectively. Few of them discuss the technical or interdisciplinary expertise needed to combine gender and value-chain analysis. The review also found limited guidance on the use of digital technologies for data collection or analysis. Finally, while several tools recognize the relevance of multiple social identities, such as age, ethnicity and socio-economic status, none fully integrate an intersectional approach or offer practical guidance on how to do so. Some resources were excluded from the review because of insufficient detail to enable use or replication of the tools and methods by other researchers or development practitioners.

4.7.3 Challenges in the process of curating, tagging and publicizing the tools collected

The authors followed the original framework to classify tools and methods but encountered challenges in assigning each resource to a single type. In some cases, resources were tagged under multiple categories—such as being labeled simultaneously as a framework, action research tool and toolkit—illustrating the difficulty of maintaining consistent classification. This kind of overlap complicates documentation and reduces the usefulness of metadata for organizing and retrieving information. While the authors retained the distinction between approach, method and tool from the original framework, this categorization does not appear to add analytical value, as many resources overlap across these categories and cannot be easily separated in practice. These inconsistencies highlight the need to define a primary tool type for each resource, apply controlled vocabularies and use standardized metadata fields so that value-chain tools can be coherently classified and reliably retrieved across repositories rather than scattered across overlapping categories.

4.8 Theme 8. Women's empowerment and nutrition

A review of measures and indicators for assessing the relationship between women's empowerment and nutrition examines how the relationships between women's empowerment and diet and/or nutrition outcomes are being assessed. The indicators of women's empowerment were organized into five categories: access to resources (household and intrahousehold), time use, caregiving resources and a general category. Nutrition outcomes for women and children were grouped into two categories: dietary indicators and anthropometric assessments. The study then analyzed how combinations of women's empowerment indicators and diet or nutrition outcomes are used to assess these relationships and describe main findings.

By organizing resources and indicators into sub-categories, the authors were able to identify research gaps and key findings on the relationship between women's empowerment and nutrition outcomes. However, the study did not classify resources in a way that facilitates their consistent organization, retrieval, or reuse across different analyses, only presenting a classification of a sample of tools in the annex.

4.8.1 Data description

The review identified 40 studies that examined linkages between women's empowerment and nutrition outcomes using available tools such as the Women's Empowerment in Agriculture Index (WEAI) family of indices.

Indicators commonly used across studies included women's participation in household decision-making, control over income, ownership of assets, access to credit and workload distribution. Most quantitative studies relied on cross-sectional data and examined associations between empowerment domains and outcomes such as dietary diversity, child nutrition and women's body-mass index (BMI). Qualitative tools were less common.

4.8.2 Research contribution and gaps

The paper reviews how studies over the past decade have examined links between women's empowerment and diet and nutrition outcomes for women and children. Most studies assessed dietary diversity and anthropometric indicators such as BMI, weight-for-age, height-for-age and weight-for-height, while fewer examined infant and young-child feeding practices such as exclusive breastfeeding or minimum acceptable diet. The authors note that most analyses were cross-sectional and not grounded in clear causal pathways, limiting understanding of how empowerment influences nutrition. They call for more rigorous, pathway-based impact evaluations and better measurement of empowerment domains such as time use and male involvement to clarify how women's empowerment affects nutrition outcomes.

4.8.3 Challenges in curating, tagging and publicizing the tools collected

Many tools were embedded within larger studies or program evaluations rather than available as stand-alone, searchable resources, making them harder to identify. Moreover, while the authors focused on terms specific to empowerment and nutrition, they did not tag resources using more general categories such as framework, toolkit or manual. This limited the potential for cross-referencing and integrating these materials within broader repositories of gender and agriculture tools. While the study classified indicators and outcomes, the lack of a consistent, searchable framework limits the ability to curate, compare and reuse resources across studies. Establishing standardized metadata and clear repository structures would enhance discoverability and strengthen evidence synthesis for both researchers and practitioners.

5. Discussion

Across the thematic reviews of gender tools and methods, several cross-cutting patterns emerged. One clear strength was the overall breadth of tools and approaches identified across gender research themes. The eight reviews covered different areas of gender and agrifood systems research and showed that this research draws on a rich set of tools, methods, frameworks and practical resources. These tools serve a range of purposes, such as data collection, analysis, implementation, facilitation and training, which enhance the quality of gender research and its practical application. For some themes, such as gender-transformative approaches and social inclusion, many tools are explicitly designed to increase gender equality, social equity and women's empowerment in agrifood systems.

At the same time, the synthesis showed that the scope of the reviews varied widely. Some focused on a narrow set of tools, such as time-use measurement methods, while others included a broader mix of research tools, practical guidance or conceptual frameworks. This diversity made it difficult to categorize and document the tools uniformly. Some themes presented extensive classifications, while others highlighted notable gaps in tool availability and documentation.

A recurring challenge was the lack of guidance on identifying vulnerable groups, which risks reinforcing exclusion in gender research. Greater attention to intersectionality, accessibility and scalability across tools would help ensure that diverse groups can be better reached and that tools can be adapted across contexts. Clearer documentation of whether and how tools have influenced policy or practice would also strengthen understanding of their real-world relevance. Moreover, evidence of use or adaptation would help improve assessment of tools' practical applicability and potential for wider uptake.

This research also shows that tools differ widely in their intended users. Some themes offer practitioner-oriented resources, such as implementation guides, facilitation tools and participatory methods, while others provide research-focused instruments, such as measurement frameworks, indicators and analytical methods. Clearer audience tagging would help users quickly identify which tools are designed for their needs.

The synthesis also revealed challenges in how gender-research tools are labeled and described. Terms such as method, methodology and approach were used interchangeably, while resource types—such as tool, guide, manual and framework—were applied inconsistently. This lack of standardization complicates classification and limits the discoverability and reuse of resources across research communities. Many tools are multifunctional, serving diverse purposes and audiences, which further complicates consistent categorization. These patterns point to a need for clearer definitions, harmonized metadata and the use of controlled vocabularies to ensure comparability and interoperability across systems. Establishing core definitions and classification rules at the outset would have helped reduce ambiguity and guided teams in applying consistent standards throughout the review process. A complementary aim of this exercise is to elevate high-quality tools and encourage their broader uptake. When strong tools are more widely used and adapted, they generate evidence that can inform programming and policy, increasing their impact across agrifood systems.

The challenges encountered across the reviews suggest that the original classification in Figure 1 would benefit from refinement. In particular, the top-level categories of "tool", "method", and "approach" are too broad to support consistent tagging, yet creating highly specific categories at the outset proved impractical across diverse themes. A more effective structure would use a single, broad, parent category, for example, "research methods, tools, and approaches"—under which clearly defined subcategories can be applied (e.g., framework, toolkit, training manual, assessment method, etc.). This two-level structure

retains necessary flexibility while avoiding vague labels such as “approach”, and would allow teams to classify multifunctional resources more consistently. Introducing a controlled vocabulary of subcategories and requiring brief definitions for each would further enhance interoperability, comparability and discoverability across themes.

Throughout the process of collecting and curating gender-research tools for each thematic paper and posting the curated set to the resource hub, the writing teams encountered additional challenges. One major difficulty was determining which tools to include. Assessing quality across a diverse and unevenly reviewed set proved complex, leading writing teams to apply different selection criteria to identify high quality tools. Developing clearer, shared criteria for inclusion and quality assessment would help increase consistency in future curation efforts. Decisions about what information to include in each tool summary and how to define key categories were similarly challenging, particularly given the wide range of intended audiences and tool purposes. Categorizing tools by theme and typology required balancing usability with sufficient detail, and in practice, an iterative approach—where categories were revisited and refined as new tools were added—proved most effective.

Inconsistencies also emerged in how tools were summarized, underscoring the importance of involving original writing team members who understand the context and purpose of each tool. Investing in standardized templates and guidance for summarizing tools, along with dedicated curation support, would improve consistency and reduce ambiguities. Overall, the experience highlighted that curating tools is a resource-intensive process that requires early planning, consistent oversight and close collaboration with domain experts. The cross-cutting challenges identified across the thematic reviews underscore the need for more systematic curation workflows, including early alignment between researchers and knowledge-management teams on metadata standards, definitions and quality criteria. Establishing shared protocols for tagging, classifying and summarizing tools would enhance consistency across themes and significantly improve long-term discoverability and reuse within the resource hub. Improving gender-research tool curation depends not only on better metadata systems but also on sustained coordination among researchers, reviewers and knowledge-management teams. In many cases, knowledge-management staff do not have enough information about a tool or may be unaware of the level of metadata needed to make resources truly Findable, Accessible, Interoperable, and Reusable (FAIR). Raising awareness among both gender researchers developing the tools and the knowledge-management teams responsible for curating them would help ensure that richer and more consistent metadata are produced from the start.

Two main strategies can support better metadata integration for gender-research tools. One involves refining existing metadata schemas by adding gender-relevant terminology under established elements—such as methodology type, tool function or level of application. The other entails developing a dedicated application profile tailored specifically to gender methods and tools, enabling more granular classification while maintaining interoperability with broader metadata standards. However, creating and sustaining such a profile requires dedicated technical expertise and sufficient funding. Effective metadata integration ultimately depends on close collaboration between researchers and knowledge-management specialists, ensuring that practical insights from the field are translated into standardized, interoperable formats.

Overall, the synthesis shows that while the thematic papers provide a rich body of gender-research tools, the absence of harmonized knowledge-management practices limits their collective value. Strengthening metadata, classification, documentation and repository management practices would transform the resource hub into a more robust, searchable, and interoperable knowledge infrastructure capable of supporting long-term learning and gender research across CGIAR.

6. Conclusion

Taken together, the synthesis of the eight thematic papers and the review of metadata best practices underscore both the significant progress made and the persistent challenges in advancing gender-responsive research in agrifood systems. The thematic reviews revealed diverse and innovative approaches, yet also exposed inconsistencies in classification, documentation and application across domains. These gaps limit the visibility and reuse of resources and highlight the need for a more systematic approach to organizing gender-research tools. At the same time, the reviews point to a substantial body of tools already available across gender research themes, which could have greater impact if their documentation and intended audiences were more clearly specified. Embedding FAIR principles into the design, documentation and storage of gender-research tools would significantly strengthen their long-term accessibility, interoperability and reuse across CGIAR and the global gender-research community.

Harmonized metadata frameworks—particularly those that incorporate controlled vocabularies and gender-relevant terminology—offer a clear pathway forward. Adopting controlled vocabularies for tool types, purposes and audiences would improve semantic consistency across gender research themes and enable more accurate cross-tool comparisons. Institutionalizing knowledge-management workflows, even simple ones, such as metadata templates for tool creators, would greatly reduce variability in documentation and support higher-quality repositories over time.

Improving how gender-research tools are documented and classified is not just a technical exercise; it is one of the foundations to more inclusive, transparent and cumulative knowledge building. Raising awareness and strengthening connections among both gender researchers developing tools and knowledge-management teams responsible for curating them will be essential for producing richer and more consistent metadata. Establishing sustained coordination mechanisms between researchers and knowledge-management teams as well as clear curation protocols and maintenance plans will be essential to ensure that gender-research tools remain findable, interoperable, and up to date as the evidence base evolves. Strengthening these practices will help elevate high-quality tools, support their broader uptake, and increase the likelihood that they generate evidence capable of informing programming and policy.

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