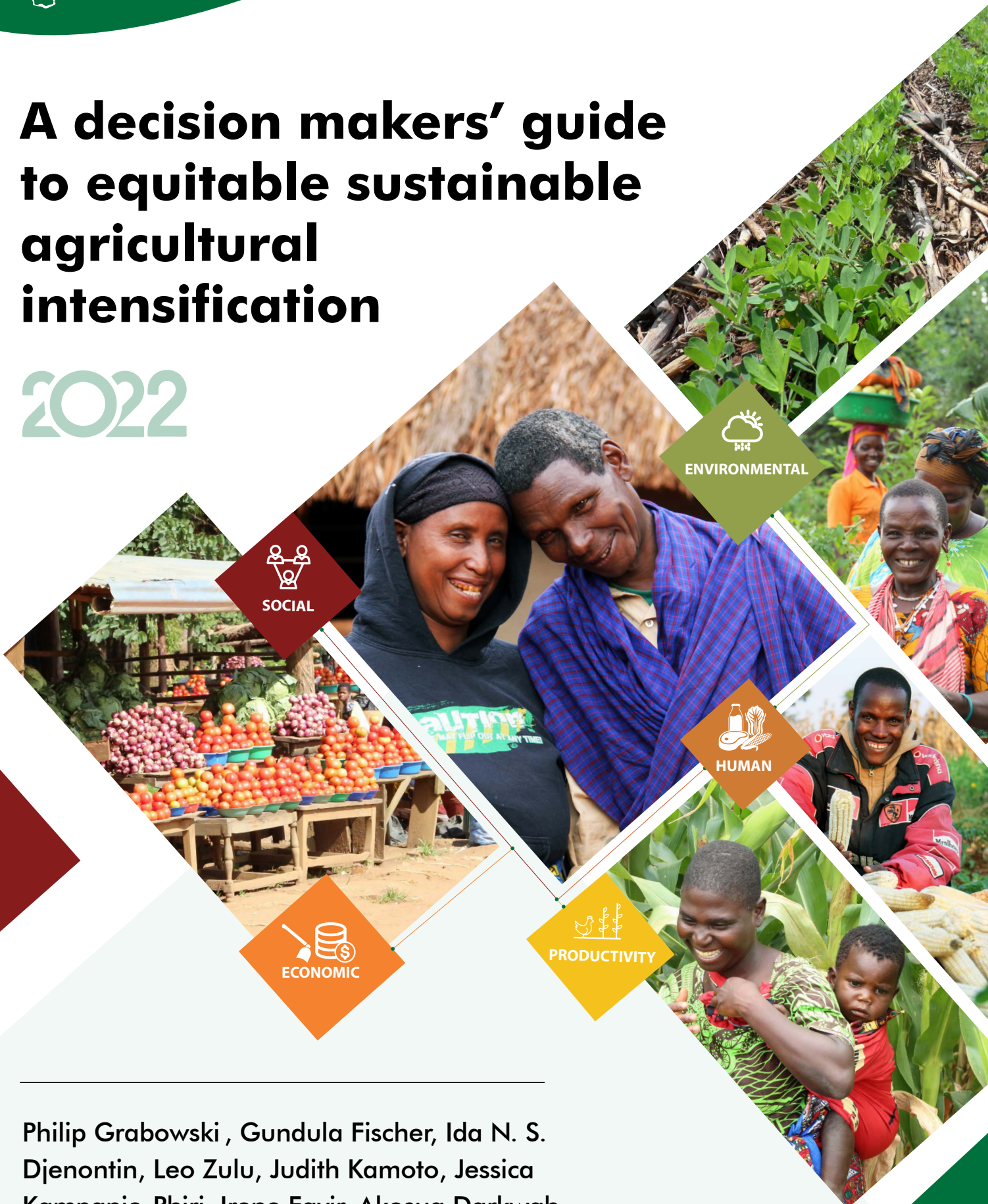# A decision makers' guide to equitable sustainable agricultural intensification

2022

ENVIRONMENTAL

SOCIAL

HUMAN

ECONOMIC

PRODUCTIVITY

Philip Grabowski , Gundula Fischer, Ida N. S. Djenontin, Leo Zulu, Judith Kamoto, Jessica Kampanje-Phiri, Irene Egyir, Akosua Darkwah

Africa RISING

A decision makers' guide to equitable sustainable agricultural intensification

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2022

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About Africa RISING

The Africa Research In Sustainable Intensification for the Next Generation (Africa RISING) program comprises three research-in-development projects supported by the United States Agency for International Development (USAID) as part of the US Government's Feed the Future initiative.

Through action research and development partnerships, Africa RISING is creating opportunities for smallholder farm households to move out of hunger and poverty through sustainably intensified farming systems that improve food, nutrition, and income security, particularly for women and children, and conserve or enhance the natural resource base.

The three regional projects are led by the International Institute of Tropical Agriculture (in West Africa and East and Southern Africa) and the International Livestock Research Institute (in the Ethiopian Highlands). The International Food Policy Research Institute leads the program's monitoring, evaluation, and impact assessment.

About Africa RISING – SAIRLA Project

The 'Improving the use of tools to make sustainable agricultural intensification more equitable' (Africa RISING – SAIRLA Project), was part of the Sustainable Intensification of Agricultural Research and Learning in Africa (SAIRLA) Programme which was implemented between 2015– 2020. Funded by the UK Department of International Development, the programme generated evidence and design tools to enable governments, investors, and other key actors to deliver more effective policies and investments in sustainable agricultural intensification that strengthen the capacity of poorer farmers', especially women and youth, to access and benefit from sustainable agricultural intensification in Burkina Faso, Ethiopia, Ghana, Malawi, Tanzania and Zambia.

Africa RISING – SAIRLA Project was implemented by partners in Ghana and Malawi and was led by the International Institute of Tropical Agriculture (IITA), in collaboration with Michigan State University (MSU), University of Ghana and Lilongwe University of Agriculture and Natural Resources (LUANAR).

SAIRLA   Funded by UKaid from the British people   Managed by wyg   and   UNIVERSITY of GREENWICH | Natural Resources Institute

IITA Transforming African Agriculture   MICHIGAN STATE UNIVERSITY

Suggested citation:

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List of Acronyms

Africa RISING	Africa Research in Sustainable Intensification for the Next Generation
CTA	Technical Centre for Agricultural and Rural Cooperation
EU	European Union
FAO	United Nations Food and Agriculture Organization
IFAD	International Fund for Agricultural Development
GALS	Gender Action Learning System
GLTN	Global Land Tool Network
GYBT	Gender and Youth Balance Tree tool
ICRW	International Center for Research on Women
IFPRI	International Food Policy Research Institute
IITA	International Institute for Tropical Agriculture
NGO	Non-governmental Organization
PID	Participatory Indicator Development
PLA	Participatory Learning and Action
SAI	Sustainable Agricultural Intensification
SAIRLA	Sustainable Agricultural Intensification Research and Learning Alliance
SWOT	Strengths, Weaknesses, Opportunities, Threats
UKAID	United Kingdom Aid
USAID	United States Agency for International Development
VCA	Value Chain Analysis
YLRC	Youth and Land Responsiveness Criteria
YPARD	Young Professionals for Agricultural Development

Acknowledgements

Executive summary

I n many parts of the world, there is a clear need for investment in agriculture to counteract low yields and food insecurity. Focusing only on short-term production gains, however, through technologies such as improved seeds, irrigation, fertilizers and pesticides, increases risks to the environment and human health.

Assessing the sustainability of agricultural intensification must go beyond simply finding economical ways to preserve agriculture's natural resource base and reduce environmental harm from agriculture. The process of sustainable agricultural intensification (SAI) has to also be inclusive and move towards social equity if it is to be truly sustainable. There are many tools for assessing agriculture through an environmental or economic lens, but relatively few that use social criteria. This leaves a gap as more SAI projects and investments aim to achieve equitable benefits across gender and age lines.

This guide provides decision-makers with data collection tools to assess gender and youth inequities associated with changes during SAI. These tools were developed and refined following workshops, field work and interviews with decision-makers in Ghana and Malawi.

In agricultural research, important social data often comes from large-scale household surveys that need significant investment of time and money. This guide focused on non-survey data collection tools, many of which originate from participatory learning and action, for two reasons: participatory tools encourage reflection by participants to increase stakeholder equity, and they are often better matched to the resource requirements and time constraints of those involved.

Tools are presented based on their ability to provide information about three identified risks to equity from the SAI process: (i) unequal increases in workload, (ii) unequal access to and use of agricultural resources and (iii) inequitable impacts from changes in technologies and markets. For each tool, an overview explains how the tool relates to SAI. Then, the steps needed to facilitate use are presented, followed by special considerations for effective implementation.

The guide supports decision-makers in choosing appropriate data collection tools and in effectively using the information. To make the choice of tool easier, information is provided on affordability, timeliness and human resource requirements for each. Also considered is each tool's ability to assess potential technologies *ex ante*, so decision-makers can adapt them before implementation to better foster gender and youth equity. Finally, a number of examples of decision-making tools are presented with how to use the data collected to inform more inclusive SAI.

The goal is to enhance the capacity of decision-makers to make a robust analysis of the distribution of benefits and burdens resulting from SAI investments. Decision-makers are encouraged to apply the tools within a community-driven gender-transformative process that aims to change the norms that perpetuate social inequities, by simultaneously influencing household, community, market and political domains.

Significant risks to equity that could result from the SAI process

1
Unequal increases in workload

2
Unequal access to and use of agricultural resources

3
Inequitable impacts from changes in technologies and markets

1 | Introduction
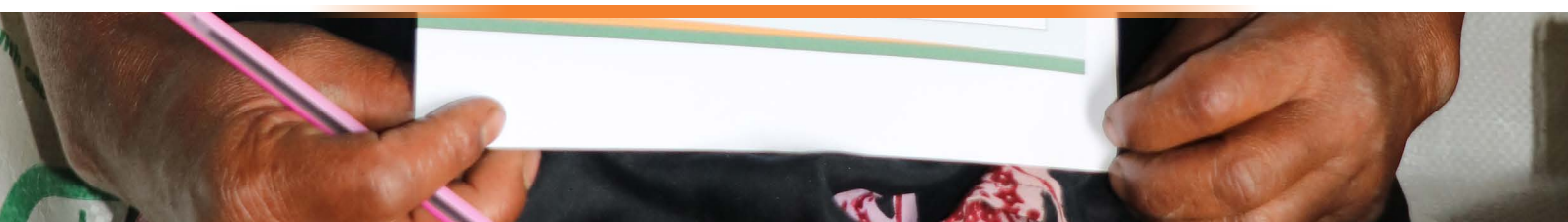
Rationale, purpose, and goals

In the development context, sustainable agricultural intensification (SAI) is a key strategy to transform farming systems, to respond to low yields, food insecurity and land degradation. However, current practices do not emphasize equitable benefits across gender and age. As a result, decision-makers may be unaware of, or disregard, issues of equity, such as increases in women and child labor, or gendered and age-related impacts on land access and use rights (Snyder and Cullen 2014; Zimmerer et al. 2015). As such, interventions can obscure important issues of justice (Loos et al. 2014) and social sustainability such as gender and youth equity (Zurek et al. 2015). These are not only essential development goals but are also important determinants of the adoption of intensified practices (Doss and Morris 2000; Ellis-Jones et al. 2012; Ndiritu et al. 2014).

For SAI interventions to be successful, there is a need to better understand how to enhance equitable access to and control over resources, and to explicitly consider women's and young people's needs and priorities in associated processes. At the most basic level, policymakers, investors and development program managers must have adequate tools to identify when interventions will address the priorities of marginalized groups and when they will result in increasing the marginalization of youth and women. Equitable SAI also requires being able to discern how to best mitigate negative effects on women and youth and how best to foster just relationships across gender and age lines.

First, the goal of this guide is to provide decision-makers with data collection tools that match their needs and resource requirements. Accurate information is key for making sound decisions. In-depth research protocols exist to precisely measure progress towards gender empowerment (many of which are summarized in Elias et al. 2021), but they require significant investment that may be beyond the reach of many of the organizations regularly making decisions related to SAI. Thus, we present accessible ways of gathering data to improve decisions related to gender and agriculture without such high investments. This guide complements the Sustainable Intensification Assessment Framework (Musumba et al. 2017a), specifically focusing on assessing equity across gender and age from changes in agriculture. Section 4 of this guide focuses on participatory methods for data collection, for use on their own or alongside other methods. Some tools were adapted to suit the SAI contexts and to include both gender and youth analyses.

Second, this guide aims to connect the data collection process with a process of transforming norms related to gender and age biases. This is in line with new efforts to move agricultural research and development beyond accommodating gender approaches, towards structural change. Accommodating approaches work around existing inequalities, while transformative approaches seek to address constraining norms and other structural barriers that underlie social imbalances (McDougall et al. 2021). In the description of each tool, opportunities for reflection and dialogue during data collection are highlighted to support a transformative process. General guidelines are also provided for community interaction and facilitation of the exercises to reduce negative impacts that may arise from expert-driven and extractive data collection.

Third, the final goal is to support the process of using information collected about gender and youth equity for real-world decision-making regarding SAI. In Section 5, a list of decision-making tools applicable to various situations is provided, highlighting how to link information from the data collection tools to decision-making processes.

Process of developing this guide

This guide was developed as part of the research project '*Achieving equitable benefits from sustainable agricultural intensification through more effective tools and metrics*' (2016–2019) under the UKAID-funded Sustainable Agricultural Intensification Research and Learning Alliance (SAIRLA) program. Research was carried out in northern Ghana and central and northern Malawi and was designed in connection with the on-going IITA-led Africa Research in Sustainable Intensification for the Next Generation (Africa RISING) project in both countries. Africa RISING is funded by the United States Agency for International Development (USAID). Researchers associated with the project experimented with new technologies for smallholder farmers and then assessed technologies across five domains of sustainable intensification (productivity, economic, environment, human condition and social). The research used to develop this guide addressed the gap in the literature on social sustainability related to sustainable intensification.

The first steps in developing the guide (Figure 1) were to document decision-makers' awareness and practices related to gender and youth equity, and to understand their decision-making contexts in order to find appropriate data collection tools. The baseline study included an assessment of decision-makers' needs through 54 interviews in Malawi and Ghana with policymakers, non-governmental organization (NGO) managers and decision-makers in the private sector. See Grabowski et al. (2020) for details on the methodology.

During the process, decision-makers in Malawi and Ghana recommended many tools, especially for gender analysis. The next step was to review literature concerning gender and youth analysis tools, starting with those most recommended. Given the mismatch between resource requirements of large-scale surveys and the resources available to decision-makers, lower-cost data collection tools were emphasized, many of which follow participatory learning and action (PLA) principles. In addition to cost-effectiveness, these tools provide more timely results, are more suitable for forecasting inequities through *ex ante* assessment and are easily integrated into a gender transformative approach.

Figure 1 ▶ The steps used to develop this guide for decision-makers

Finally, decision-makers in Malawi and Ghana provided feedback on the tools through field testing and workshops. An early draft of the guide was developed in 2018, followed by workshops with decision-makers in Accra and Tamale (Ghana) and Lilongwe (Malawi). Colleagues and partners then tested the data collection tools in the field and provided systematic feedback, including details of the benefits, costs, implementation time, training needs and quality of the information collected. The guide was then revised and presented during two final workshops held in Accra and Lilongwe in 2019, where additional feedback was collated and included in this final version of the guide. For more details concerning the testing of tools, see Grabowski et al. (2020).

Overview of the guide

Section 2 provides background information about SAI, gender and youth equity, and youth in agriculture to ensure that readers are familiar with the fundamental concepts in these areas. Section 3 presents a framework with stages in the decision-making process. As a toolbox, Section 4 summarizes critical information relating to available data collection tools for assessing the differential effects of agricultural research and investments, and Section 5 presents examples of the decision-making tools to help in using that data.

A limitation of this guide is that it lays greater emphasis on gender than on youth. This is partly because intersectional considerations have only recently gained relevance in tool development. As a result, gender tools have been adapted or suggestions are presented, regarding how to also include age aspects (Zulu et al. 2021)

2 | Background

Sustainable agricultural intensification

Agricultural intensification typically refers to higher levels of production per unit of land, which requires greater investment in agricultural inputs and infrastructure to obtain greater returns. The problems associated with the Green Revolution, however, clearly demonstrated that agricultural intensification needs to consider sustainability. Investments in irrigation, seed, fertilizer and pesticides have led to dramatically increased yields, but also to the depletion of groundwater, soil salinization and pesticide poisoning of farm workers. These negative impacts are not only tragic, but also threaten the continuation of high-yielding agriculture, although many could have been avoided through careful planning and a holistic consideration of agricultural changes (Carswell 1997).

In spite of this, no agreed understanding has emerged of what sustainable agriculture actually means. Diverse views sometimes complement each other, although divergence and disagreement may even be necessary in working towards such a complex goal as agricultural sustainability (Velten et al. 2015). Nevertheless, it is clear that sustainability must go beyond environmental concerns and also consider economic and social issues. For instance, researchers and extension agencies promote agricultural technologies as sustainable, if they reverse soil degradation while maintaining or improving yields (e.g. agroforestry, composting and conservation agriculture). However, in some contexts, farmers are unable to use these technologies because they are not profitable, especially if they require too much labor or financial investment (Carswell 1997).

SAI aims to achieve a balance across a wide range of priorities, including improved livelihoods and food security, while caring for environmental concerns, such as soil fertility, and conservation of biodiversity and ecological resources (Reardon et al. 1995). However, SAI has been criticized for having a top-down approach, a narrow focus on production (Petersen and Snapp 2015) and inadequate integration of socio-cultural contexts (Snyder and Cullen 2014; Fischer et al. 2021a).

To balance the various facets of sustainability more effectively, Musumba et al. (2017a) developed a sustainable intensification assessment framework that encourages users to compare technologies and projects across these various goals. This guide is based on that framework, organizing the facets of sustainability in the following five domains:

- **Productivity:** Crop yields and livestock productivity with attention to land as a critical input.

- **Economic:** Profitability of farm activities and returns to factors of production (land, labor, capital).

- **Environment:** The natural resource base for agriculture (soil, water etc.) and the impacts from agriculture on ecosystems (e.g. pollution, deforestation).

- **Human:** Individual-level development goals related to agriculture, such as nutrition, food security and education.

- **Social:** Interpersonal and community relationships, including gender and youth equity.

The focus of this guide is on data collection methods for the social domain.

Gender and youth equity

Equity is understood as fairness and justice in decision-making and in the distribution of resources and responsibilities. In other words, it is the establishment of a level playing field for all social actors including women and youth. Equity is thus a process that seeks to compensate certain groups for disadvantages that have historically developed and that continue to shape their lives. In the long term, equity is meant to produce equality. A critical component of working towards gender equality is women's empowerment, more specifically the identification and transformation of power imbalances that

obstruct equal opportunities (Moghadam and Senftova 2005). Conceptually, it can be helpful to regard equity as having various components. Based on Kabeer's seminal work on women's empowerment (Kabeer 1999), Musumba et al. (2017b) present the following categories that are relevant to both youth and gender equity:

- **Resources:** The fair allocation of physical resources and the need to assess differential access to resources for agriculture, especially land, livestock, inputs and equipment.

- **Capacity:** The fair allocation of information and training resources and the need to assess differential access to information about markets or agricultural practices.

- **Agency:** Fair procedures and the need to assess differential levels of control over resources.

- **Achievements:** Fair exchange and the need to assess differences in realizing various benefits from agriculture, such as income, food security, nutrition and health.

In recent years, it has become clear that transformative efforts need to include both women and men. Emerging gender-transformative approaches challenge an exclusive focus on women in empowerment programs, a focus that ignores the important roles of men as change makers. Such approaches aim at fostering enduring change by considering not only tangible gender gaps, but also deep-seated social norms that reproduce inequality (Wong et al. 2019).

Furthermore, the concept of intersectionality has directed attention to the differential situation of young women as compared to older women, or young men as compared to older men. Intersectionality denotes that imbalances are never the result of one social factor only (for instance gender), but are the result of interactions between various social factors such as gender, age, religion and class (Hankivsky 2014). Issues of youth equity have therefore gained increased prominence in agricultural development. It is expected that improving young people's access to land, information, financial services and markets will increase their participation in farming and reduce poverty among older and younger household members alike (FAO et al. 2014). Critics encourage the integration of youth and gender analyses, but also warn against overlooking the interests that adults and youth may share (Glover and Sumberg 2020).

Assessing youth equity in agriculture

Assessing youth equity in SAI goes beyond improving youth productivity and includes enhancing opportunities for young people through job creation, skills development and access to productive resources such as finances and land. This objective is in line with overarching development goals and efforts to lift young people in sub-Saharan Africa out of unemployment and underemployment through the potential offered by self-employment and entrepreneurship in the agriculture sector (FAO et al. 2014). To implement an intervention approach that is equitable for youth, it is important for project and program managers, as well as other decision-makers, to understand who the young people are and the key constraints and challenges that they face in engaging in agriculture. This includes seeking to understand the context-specific factors that shape young people's interests and their choice of agriculture as a pathway for their own development.

The category of 'youth' can mean different things to different people, depending on cultural and social contexts. Understanding these categorizations is critical for clear communication concerning youth-inclusive agricultural change. Rather than seeing youth as a single category, research on participatory indicator development (PID) for inclusive SAI shows that there is a wide variation in respect of age and life stage (e.g. having a child, physical ability), marital status and socioeconomic dependency. Within the 10–40-year-old age range, local perceptions in Malawi and Ghana see two categories as the most important for assessing inequities in SAI: dependent adolescents (10–19 years old), who typically live with their parents and attend school; and independent men and women, who may be married and typically live apart from their parents (Zulu et al. 2019). Most respondents perceived dependent adolescents as unpaid family labor, largely excluded from decision-making. Respondents also tended to undervalue the contributions of independent young people. However, many young respondents denied being disadvantaged in terms of sharing the benefits of SAI (Zulu et al. 2019).

Several key factors impede youth engagement in agriculture (FAO et al. 2014). In an effort to contribute to addressing these challenges, a USAID-supported initiative (Youth Power) has outlined seven thematic areas (Table 1). Interviews in communities and with key stakeholders in Malawi and Ghana supported the significance of these challenges for youth engagement in SAI (Zulu et al. 2021).

There are not many youth-specific data collection tools for assessing youth equity in agriculture. Instead, gender-analysis tools can be adapted for assessing the intersectionality of gender and age (Table 1). Details on how to facilitate each of these data collection tools (and others that may also be relevant) are given in Section 4. A discussion of the appropriateness of some tools for detecting youth inequities, and feedback from decision-makers on using such tools in Ghana and Malawi, can be found in Zulu et al. (2021).

The webpage 'What works in youth and agriculture, food security and nutrition' (Youth Power no date) has a wide range of resources to address each theme, a few of which are included in Table 1. Besides being a rich repository of analytical resources, this webpage also offers resources that SAI programs can adapt for increasing the engagement of young people. An additional resource for developing a youth-focused program is 'Youth compass: A strategic guide to strengthen youth activities' (Youth Power 2017).

Table 1 ▶ Thematic areas related to youth in agriculture

Theme	FAO et al. (2014)	Youth Power Network	Related tools in this guide (Section 4)	Resources for further study
Youth access to land	X	X	Youth and land responsiveness criteria tool	What land means to youth (Sait et al. 2013); Youth access to land, migration and employment opportunities (Yeboah et al. 2019)
Youth access to financial services	X	X	Gender- and youth-sensitive value chain analysis	How to do: Youth access to rural finance (Hamp et al. 2015)
Skills development, agriculture education and training for youth	X	X	Gender and youth balance tree/leaky bucket (with a focus on education costs)	Equipping young people to make a change in agriculture: 2017 internal review of YPARD's pilot mentoring program (YPARD 2017)
Youth unemployment, job creation (green jobs) and agriculture	X	X	Gender- and youth-sensitive value chain analysis	Agrifood youth employment and engagement study (Allen et al. 2016)
Youth access to markets and engagement in agriculture	X	X	Gender- and youth-sensitive value chain analysis	Young people and agriculture in Africa: A review of research evidence and EU documentation (Asciutti et al. 2016)
Youth engagement in policy dialogues	X	–	Youth and land responsiveness criteria tool	YPARD Strategic Plan 2018–2021 (YPARD 2018)
Youth-inclusive gender considerations	–	X	Gender and youth balance tree	The girl effect: What do boys have to do with it? (ICRW 2010)
Youth, agriculture and technology	–	X	Participatory rating of technologies	An ICT agripreneurship guide: A path to success for young ACP entrepreneurs (CTA 2017)

For assessing the needs of youth at country level, USAID's 'Guide to cross-sectoral youth assessments' (Israel et al. 2009) provides important lessons. First, experience showed that many youth programs fail to reach their target audience of the most vulnerable, often because those individuals are more difficult to involve during the planning phase. Young people are, however, able to participate in assessing the situation from the earliest stages of program planning, and the authors of the report encourage well-facilitated focus groups as an effective data collection tool with youth.

Whatever the thematic focus or the data collection tool, it is important to consider the following guidelines (adapted from Youth Power no date):

- Clearly identify and learn about the specific segment of youth being targeted, including their goals, expectations, challenges and opportunities.

- Learn how each youth segment currently engages in agriculture and food systems, and consider the opportunities for greater involvement and upgrading.

- Identify and prioritize addressing the major barriers preventing youth from greater participation and benefits from agriculture, bearing in mind that barriers are likely across the four domains identified by Kabeer (1999): household, community, market and government.

- Identify interventions that align the skills and interests of youth with opportunities in the agriculture sector.

Methodology of the guide

The emphasis in this guide is on tools that have potential for *ex ante* assessments or the early detection of disparities through on-going monitoring. Suitable tools were identified and adapted from participatory approaches. Starting in the 1980s, Chambers (1997) advocated for these approaches to ensure that the diverse voices and needs of farmers in the South gain priority in development processes. Since then, practitioners have developed a large variety of participatory tools to collect qualitative and quantitative information (Pretty et al. 1995). In the past decade, participatory approaches have re-gained popularity. As outlined in Section 3, it is expected that co-learning processes that involve farmers, researchers and development actors will contribute to solving 'wicked problems' that science alone cannot untangle, relating to inequity in SAI.

Participatory tools support such processes, increase the relevance of solutions to specific contexts and provide room for women and youth to voice their perspectives and needs that often remain unheard in the course of interventions (Newton et al. 2019). Gender-transformative interventions see critical reflections on inequalities framed by these approaches as one component of broader mechanisms to promote change (Cole et al. 2015). As such, participatory approaches may be used with differing degrees of participation (Figure 2) and for various purposes, such as for informing decision-makers' understanding and action to actually empower women and girls (Newton et al. 2019).

Contractual
- Farmers hired to run experiments
- Researcher has control

Consultative
- Farmers consulted about design and interpretation
- Researcher still controls

Collaborative
- Regular interaction throughout process
- Shared decision making power

Collegial
- Researchers strengthen farmers' informal inquiry
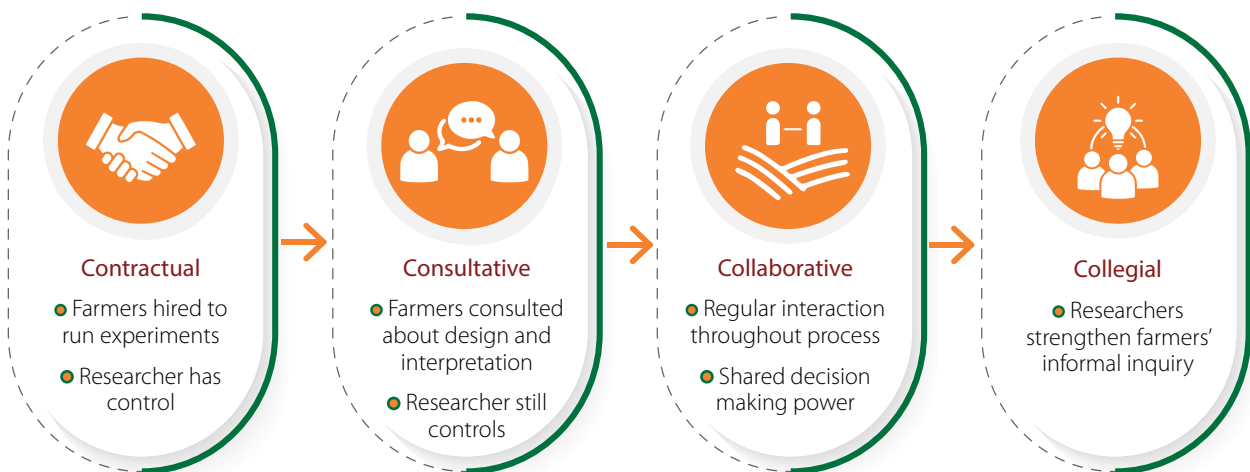
Source: Adapted from Biggs (1989) and Buhler et al. (2002).

Figure 2 ▶ The continuum of participation in agricultural research

In any case, the use of participatory tools is not sufficient for ensuring a participatory process. The degree of participation often depends on the time and financial resources decision-makers have at their disposition (or make available) and on access to skilled facilitators. Facilitation of participatory tools requires an attitude of humility and learning (including unlearning inappropriate knowledge, attitudes and beliefs), together with persistent effort to 'hand over the stick' to community members so that their voices can be heard (Chambers 1997). Furthermore, data analysis demands careful reflection to avoid oversimplification of complex social realities (Chambers 1997; Goebel 1998). For this reason, decision-makers should triangulate findings with other methods, compare their results with results from other sources and keep an open mind for alternative interpretations as more information becomes available. Section 3 presents information on these aspects in relation to the tools included in this guide.

3 | Decision-making for equitable sustainable agricultural intensification

Conceptualizing the decision-making process
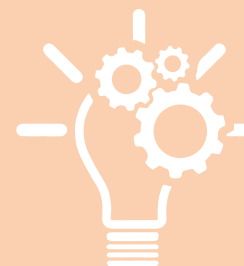
Decision-making is a complex process that rarely follows a linear and logical course. This is especially the case with environmental and social aspects of development, where the information is marked by high levels of uncertainty. Furthermore, conflicts may arise when stakeholders have differing priorities and differing sets of values. Sustainability science has adopted the term 'wicked problems' from Rittel and Webber (1973) for describing these types of challenges. Wicked problems are those that have high levels of uncertainty, are poorly defined and have value conflicts. In contrast, problems that have a low level of value conflict and limited uncertainty are 'tame' and can be solved by experts with 'normal' science. Batie (2008) argues that wicked problems require 'engaged science', where scientists and non-scientists collaborate to address issues through co-learning.

Many challenges related to SAI belong to the category of wicked problems. Literature has emphasized the importance of farmer participation and local knowledge for developing technologies or changes in farm practices (e.g. Fujisaka 1994; Pretty 1997; Biggs and Smith 1998; Méndez et al. 2017). To make progress towards SAI, decision-makers need to consider the participation of women and men farmers of different age groups to ensure that the SAI processes are equitable.

Figure 3 shows cycles of action and learning as a key strategy for making decisions about complex problems, such as achieving equitable SAI. These cycles are similar to adaptive management. Natural resource management has used the process of adaptive management to learn from decision-making by using experimental designs to reduce uncertainty and handle complexity (Williams 2011). Such learning is context-specific and should include critical self-reflection.
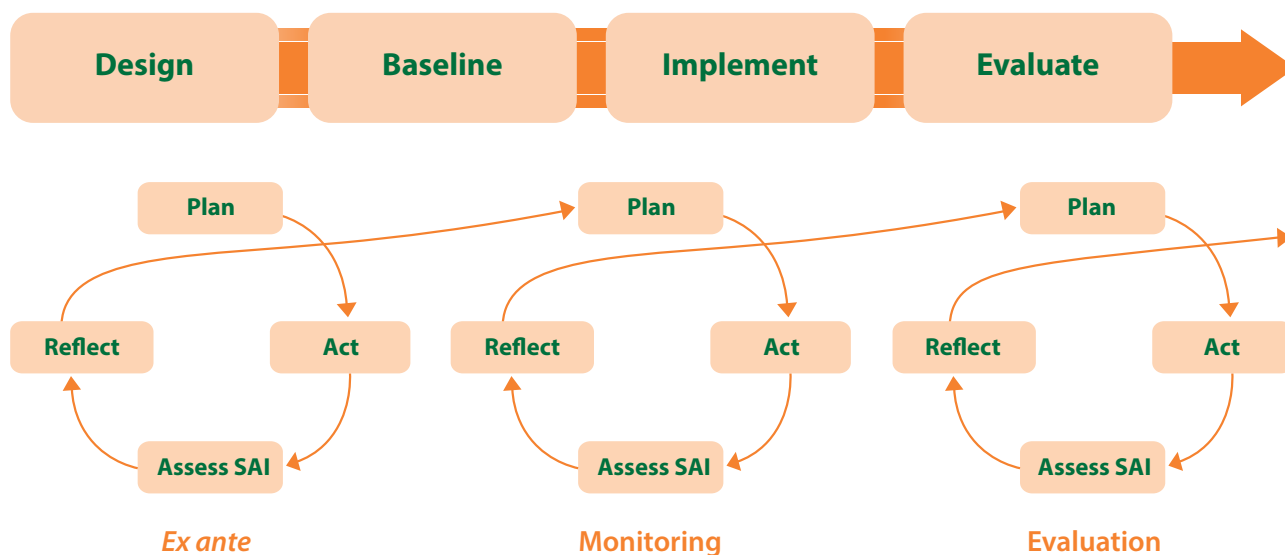
Source: Adapted from Grabowski et al. (2018).

Figure 3 ▶ Iterative cycles of action and learning for decision-making across the project cycle

This guide looks at the first five steps, though it is important to remember that the sixth and seventh steps complete the cycle. Figure 4 relates steps one to five in decision-making in SAI and shows how tools for data collection (Section 4) and tools for decision-making (Section 5) can support the process.

1 Identify the decision to be made

2 Gather relevant information

3 Identify alternatives

4 Weigh evidence

5 Choose among alternatives

6 Take action

7 Review decision and consequences

Data collection tools

Decision-making tools
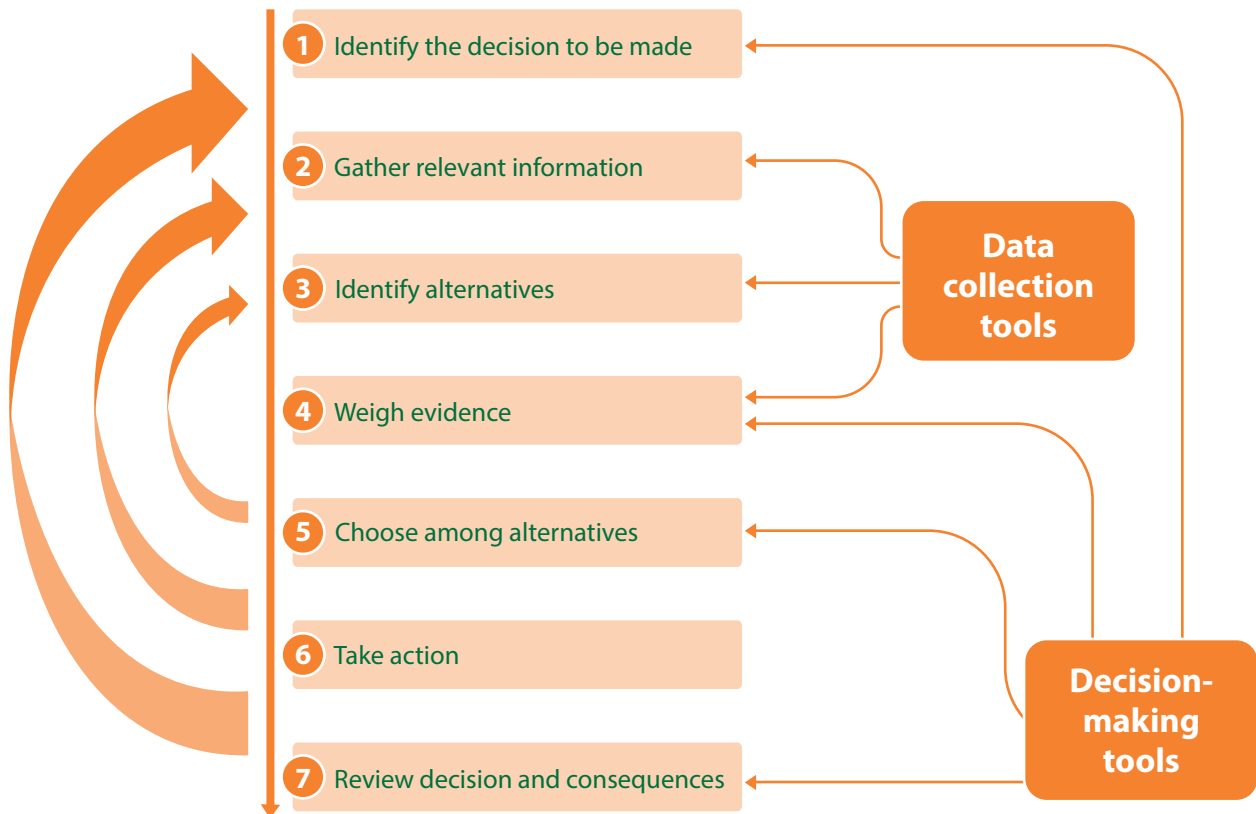
Figure 4 ▶ Steps in decision-making and supporting tools

Step 1 is to identify the decision. Clear communication about potential decisions is critical, especially when collaborating with a wide range of stakeholders. In working towards inclusive SAI, it is important to listen to different social groups, invite their participation and assess the criteria they see as relevant (keeping equity in mind). Stakeholder involvement tools such as 'bridge building' (Section 5) can be a useful way for diverse groups to share their framing of issues, including their visions of success. Starting the process with agreement about the key criteria for success helps make the values of stakeholder groups explicit, which in turn can help to guide the process of finding options that are acceptable to most stakeholders. Participatory rating (Section 4) is a tool that can be adapted to identify and evaluate criteria.

Step 2 gathers relevant information. For sustainable agriculture, the context is critically important. Familiarity with agroecological zones, livelihood systems and cultural differences will help decision-makers to have reasonable expectations in respect to balancing both local relevance and the broader transferability of agricultural technologies. Data on gender and intergenerational relations should guide equity considerations in subsequent decision-making steps. In Section 4 of this guide, tools are offered for data collection that take account of some of the most critical risks related to inequity from the SAI process: unequal increase in workload, unequal access to and use of agricultural resources and unequal impacts from changes in technologies or markets.

Step 3 is to develop options. Often, it is best to brainstorm a long list of possible options and then discuss and prioritize which ones are worth developing. When using a structured decision-making tool, like those listed in Section 5, it is important to make 'fair' comparisons. Caution is required so as to not misuse these tools to justify a preferred option, for example by making the alternatives seem unrealistic. For equitable SAI, it is important to include options that have the potential to substantially improve the situation of disadvantaged groups.

Step 4 weighs the evidence and implies an analysis of data for various criteria in respect of each option. For instance, in the case of the decision matrix tool in Section 5, weighing the evidence would mean filling in each box. Criteria could relate to the five SAI domains developed by Musumba et al. (2017a) and be presented as rows. The options developed in step 3 would be the columns and could represent various agricultural technologies. One of the five SAI domains, the social domain, is the focus of this guide (see outline of domains in Section 2). For details on how to collect data for all the domains, see Musumba et al. (2017b), which targets researchers. Participatory alternatives to intensive data collection for the social domain are available in this document.

Step 5 is to choose among the alternatives. Section 5 provides tools, such as multi-voting, T-chart and strengths, weaknesses, opportunities, threats (SWOT) analysis to assist with the process of using data for decision-making. Working towards equitable SAI requires setting thresholds to create boundaries for what are acceptable options. For example, a project manager could state that no option should be selected if it would decrease the nutrition of children, or if it is likely to add to women's labor burden. Establishing an appropriate decision rule will require input from diverse stakeholders.

Choosing tools for data collection

As decision-makers reflect on working towards SAI, they can develop hypotheses (educated guesses) about how a technology or intervention may impact people differently across genders and age groups. Data can then be collected to show whether the hypotheses are correct or not. Data collection can also be used to generate hypotheses, that is, to obtain enough general information to become better at making educated guesses. In many situations, decision-makers may be considering social contexts that they are unfamiliar with. In such cases, a general overview of household gender and age dynamics can be of great value. The Gender and Youth Balance Tree (GYBT) is particularly suitable for this purpose.

The choice of which tools to use for collecting information about gender and youth equity depends upon several criteria. First and foremost, the suitability of the tool for obtaining the relevant information must be determined. This guide provides: (i) an overview of the type of information that can be expected from each data collection tool; (ii) the appropriateness of the costs of applying the tool relative to time and resource constraints; and (iii) the staff capacity needed for data collection. A further criterion is the potential of a tool for *ex ante* assessment. In the assessment of decision-makers' needs that preceded the development of this guide (Grabowski et al. 2017), most respondents indicated that they use mid-term monitoring and evaluation tools to judge the inclusivity of interventions. While these criteria are important, there is clearly a need for *ex ante* assessment and early monitoring, so that interventions can be adjusted, or even rejected, on the basis of how they relate to gender and youth equity goals.

Table 2 relates the tools offered in Section 4 to the above selection criteria. Information about each tool is based on a literature review and on tool testing with a wide range of actors in Ghana and Malawi, including small NGOs, government officers and community-based organizations.

When preparing for data collection, decision-makers should consider that tools need to be adapted to local economic and cultural contexts. Community members can also help to adapt tools, in order to ensure that those collecting the data avoid becoming inadvertently trapped in gender or youth stereotypes. The project that led to this guide demonstrated the value of local adaptations to questions and indicators related to gender and youth equity in agriculture, especially regarding intra-household decision-making and inter-generational and gendered access to land (Zulu et al. 2020).

Decision-makers also need to be aware of the entrenched nature of inequality in many contexts. Adapting technologies and interventions to better meet the needs of women and youth is a good start, but it is unlikely on its own to transform deep and enduring inequities rooted in major issues, such as education, land allocation and culturally specific gender norms. A gender transformative approach is required to address these root causes of inequity in the long term, by changing inequitable institutions at household, community, market and government domains (Kabeer 1994; Wong et al. 2019). Changes in one domain are also more likely to be sustainable if they are supported by changes in other domains to achieve gender transformation. In this project, case studies demonstrated the need for a gender-transformative approach to develop local consensus to make changes to social and cultural norms (Fischer et al. 2021a).

Table 2 ▶ Summary of information about data collection tools

Data collection tool	Affordability[1]	Timely collection and analysis[2]	Feasibility (human resources)	Potential for *ex ante* assessment
Gender and youth balance tree (Mayoux 2012)	US$200	C: 1.5 - 2 hours A: 2 hours	Two facilitators, skilled facilitation	Medium (qualitative)
Participatory mapping – ground or sketch map (Chambers 2006)	est. US$800	C: 1 day A: 0.5 day	Two facilitators, minimal training	Strong (spatial)
Daily time use (CARE 2015)	US$161	C: 0.5 hour A: 0.5 hour	Two facilitators, minimal training	Strong (quantitative)
Seasonal calendar (Jost et al. 2014)	US$200	C: 1 hour A: 2 hours	Two facilitators, minimal training	Strong (quantitative)
Activity profile (March et al. 1999)	US$134–250	C: 1.5 hours A: 1 hour	Two facilitators, minimal training	Strong (quantitative)
Participatory drudgery score (Fischer 2022)	US$243	C: 1.5 hours A:1 day	Two facilitators, skilled analysis of scores and transcripts	Weak (better for early monitoring)
Ratings of technologies	est. US$250	C: 1.5 hours A: 1.5 hours	Two facilitators, skilled analysis of scores and transcripts	Weak (better for early monitoring)
Gender and youth-sensitive value chain analysis (Mutua et al. 2014)	US$2520	C:2 days A: 2 days	Two facilitators, design, facilitation and analysis	Weak (better for early monitoring)
Leaky bucket (Cunningham 2011)	US$250	C: 2 hours A: 2 hours	Three facilitators, skilled facilitation	Strong (quantitative and qualitative)
Youth and land responsiveness criteria tool – focus groups	US$815	C: 1.5 hour A: 2 days	Two facilitators, minimal training	Strong (detailed transcripts)

1 All cost estimates are for one community, exclude transportation to the field and are based on rates for staff time and materials from 2019 in Ghana and Malawi.

2 C = Collection; A = Analysis. Data collection times are for each group; analysis times assume data from 1–3 groups will be analyzed together.

Source: Adapted from Grabowski et al. (2020).

4 | Tools for data collection

This section provides detailed instructions for data collection tools that match decision-makers' needs for gender and youth equity analysis. While many of the tools can be applied to various issues or aspects of inequity, in this guide they are clustered in relation to three significant risks to equity that could result from the SAI processes:

1	2	3
The risk of an unequal increase in workload	**The risk of ignoring unequal access to and use of agricultural resources**	**Inequitable impacts from changes in technologies and markets**

Presented for each tool within these three clusters, are:

⊜ Introduction

An overview of the tool and why it might be applicable to SAI

⊜ Facilitation

How to facilitate the tool as it is most commonly used (often followed by some possible adaptations)

⊜ Considerations for implementation

Special considerations for effective implementation.
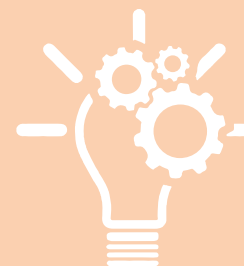
A. Tools for time and labor allocation analysis

One salient aspect of disempowerment is time poverty. This is well documented for women but is also applicable to youth in some situations. When assessing equity, it is therefore important to look at gender and age differences in the allocation of tasks and the time spent on them. Women carry multiple burdens in reproductive, productive and community work, and women's average leisure hours as compared to that of men may serve as an indicator for gender equity (Rao 2016; Musumba et al. 2017b). Below, three tools are presented that support time and labor allocation analysis: daily activity clocks, seasonal calendars and activity profiles. This is followed by a tool that assesses the drudgery of various activities, as an important consideration for labor allocation equity.

Daily time use – 24-hour recall

⮊ Introduction

During daily activity clock exercises, participants recall all activities of the previous day. Men and women (of various ages) do the exercises separately, and results show how daily tasks differ among gender and age groups. Differences may relate to the types of tasks or the multitude of tasks. The results also indicate who in a household works longer or has more leisure or sleep time.

For the implementation of daily activity clock exercises, some methodological considerations must be taken into account. Recalling activities more than one or two days previous to the interview may be considered as unreliable, since memory fades on the detailed use of time. Also, it may be better to ask for all activities on the previous day, rather than to ask about an average day, which introduces variability in how respondents perceive what is 'average'. Harvey and Taylor (2000) noted that data generated from questions asking only about specific activities (e.g. carrying water, weeding, collecting firewood) are susceptible to significant reporting errors compared to asking about all the activities in a day. When working with people who are illiterate or do not regularly use clocks, there can be challenges in obtaining accurate data. Masuda et al. (2014) developed an approach using picture cards to help address this need (Box 1). Decision-makers can also customize the categories of activities based on the level of detail that is important to their project.

SAI decision-makers may use daily activity clocks to:

- understand daily routines of men and women (and of different ages) and how their tasks and work hours differ

- assess the potential influence of a program activity on participants' daily routines and workloads

- discuss with men and women how workloads could be shared more equally (if done in mixed groups)

⮊ Facilitation

This tool uses picture cards for the activities and beans to establish the amount of time spent on each activity. It is meant to be included in individual interviews.

Box 1 ▶ Facilitation of the daily time use tool

Exercise	Daily activity clock (individual interviews)
Time	45–60 minutes
Objectives	To assess and compare daily activities of participants of different gender and age
Preparation	1. Prepare picture cards for common activities (Table 3) 2. Add activities that are context specific 3. Prepare some blank cards so that further activities can be added during the interview 4. Prepare questions for discussion after tasks and the time to be invested in them has been established
Materials	Picture cards and enough beans (or stones) of two different colors
Facilitation	1. Ask the approximate time of waking up and going to bed the previous day. Estimate the time, if necessary, on the basis of the time of sunrise and sunset. 2. Count out beans/stones of one color for the respondent's sleep time, each representing 20 minutes. 3. Next, count out beans/stones of the other color (again, each representing 20 minutes) for the entire time the respondent was awake the previous day. 4. Using a stack of cards with pictures representing the most common activities, ask the respondent which activities they performed the previous day. Cards representing activities that were not performed are set aside. Ask if any additional activities were performed the previous day and add them if needed. Lay out the cards before the respondent. 5. Give the respondent the counted-out beans/stones and explain that they represent the whole time they were awake the previous day. Point out that three make one hour. Ask the respondent to divide them among the cards, according to how much time they spent on each activity. 6. Ask the respondent to make any final adjustment to this representation of how they spent their time. When the respondent has completely finished, count the beans/stones for each activity and record the information. 7. Initiate a discussion of the results. Use the questions prepared in advance and add specific questions on the results of the exercise. 8. Compare the daily activity clocks of different participants to assess and measure gender and age differences.

Table 3 ▶ Common daily activities from two tools using the 24-hour recall

Activity category		Description
Alkire et al. (2013)	**Masuda et al. (2014)**	
Eating and drinking	Eating	Eating meals, including breakfast, lunch and dinner. Do not include time spent preparing food.
Cooking	Preparing food or coffee	Preparing food, including baking, roasting cereals and preparing coffee ceremonies.
Domestic work	Collecting water	Walking from the house to the water source, waiting to fill the container and walking home.
	Collecting firewood	Including walking from the house and back to the house.
	Household chores	Including sweeping, washing dishes and utensils, tidying, collecting and working with animal dung. Do not include time spent preparing food.
Caring for family members	Caring for children	Including breastfeeding, bathing and dressing, but not including caring for sick children.
	Visiting or caring for the sick, including individuals that may have been ill	Including care for sick household members and visiting health clinics, including time traveling to the clinic and back home.
Shopping/getting services (including health services)	Going to the market	Traveling to the market and back, as well as time spent at the market.
Farming/livestock/fishing	Agricultural work	Farming work, including plowing, sowing, hoeing, weeding and harvesting etc.
	Caring for animals	Taking animals to graze or drink.
Weaving, sewing, textile care	Other work	Other physical work like repairing houses, fences or building shelters.
Work for an employer		
Work for own business		
Social activities and hobbies	Coffee, social or religious gatherings	Socializing, attending coffee ceremonies, going to church, attending funerals and relaxing by yourself.
Religious activities		
Watching TV/listening to the radio/reading		
Exercising		
Personal care	Washing and bathing	Bathing and washing your clothes or body. If washing at the river or spring, include walking there and back.
	Sanitation and defecating	Including walking to find a suitable place for open defecation and walking home. Do not include if it was part of another trip (i.e. collecting firewood or water, working in the fields).
School (also homework)	Playing (for children under 15 years old)	Games and fun activities, playing with other children and school homework.
Travelling and commuting		
Sleeping and resting		

Alternative daily activity tools are available in CARE (2015), Jost et al. (2014) and Concern Worldwide (2016a). In the CARE exercise, separate men's and women's groups list all the activities they perform on a typical day and the duration of the activities on a large sheet, with a timeline starting at 6 a.m. and ending at 5:59 a.m. the next day. The groups then come together, share their lists and discuss how and why there are differences. Jost et al. (2014) and Concern Worldwide (2016a) offer a daily activity clock exercise that can be completed separately by men and women and then compared. They suggest drawing two circles – one from 6 a.m. to 6 p.m. and the other from 6 p.m. to 6 a.m. – and then using the circles to map out pie-shaped pieces to represent time spent on various activities. The pieces of pie can then be marked in various ways to visually represent the most demanding or enjoyable tasks, for example. Detailed facilitation steps as well as questions for discussion are available in Concern Worldwide (2016a).

⮱ Considerations for implementation

It is important to adapt all daily activity tools to the local context in terms of activities and terms for how time is reckoned. Over and above, the seasonality of activities also has to be considered. Some results may only be valid for the season in which data were collected. As a result, decision-makers should decide in advance for which season information is needed, and schedule data collection accordingly. It should also be remembered that if the previous day was a holiday or some other special day, activities may differ from a regular day.

Gender-sensitive seasonal calendar

⮱ Introduction

Seasonal calendars provide an overview of activities in some or all seasons of the year in a community. They may include festive periods and other recurring important events. Additionally, hunger months and extreme weather conditions can be documented. Results help to understand how various agricultural, domestic and other tasks are combined and accomplished at certain times of the year. In this manner, labor bottlenecks can be identified, as well as periods of rest. When questions on 'who does what?' are included in the tool, it is possible to see when uneven workloads manifest themselves most clearly. The exercise can also be tailored to specific SAI technologies (see Facilitation, below). Seasonal calendars can be carried out in gender-mixed groups, or separate calendars can be established for men and women, adults and young people, to allow for discussion of differences between groups.

SAI decision-makers may use seasonal calendars to:

● understand the seasonality of activities including labor bottlenecks, periods of rest, and recurring events and holidays

● recognize potentially uneven workloads men and women carry at specific times of the year

● discern where implementation of a technology could collide with other activities

● initiate discussions on fairer sharing of workloads

⮱ Facilitation

The seasonal calendar tool presented here focuses on the specific time of the year in which a selected SAI technology is implemented. Farmers identify other activities that have to be accomplished during the same time period, and who (gender, age) is responsible for them. The tool was piloted for *fanya juu* terraces, a soil and water conservation practice (Fischer et al. 2019a). It was embedded into gender-separate focus group discussions. Results of a men's group in one community are shown in Figure 5.

Box 2 ▶ Facilitation of the gender-sensitive seasonal calendar

Exercise	Seasonal calendar (with an SAI technology focus)
Time	60 minutes (within longer focus group discussions)
Objectives	1. To identify activities that could collide with the implementation of a sustainable agricultural intensification (SAI) technology 2. To capture who (gender, age) is in charge of the activities 3. To initiate discussions on how uneven workloads can be shared more fairly
Preparation	1. Invite men and women for gender-separate focus group discussions 2. Prepare two venues 3. Engage a man facilitator for the men's group and a woman facilitator for the women's group
Materials	Flip-chart paper and marker pens

Facilitation	1. Introduce the objectives of the exercise:
	
	  a. To find out when in the year the SAI technology is implemented
	
	  b. To capture what other activities or events take place during this time
	
	  c. To identify who is involved in other activities that are not related to the SAI technology
	
	2. Take a piece of flip-chart paper and draw one large circle on it.
	
	3. Ask participants in which period of the year the SAI technology is implemented. Note down the month(s) inside the circle. Record all months that are mentioned, to document diversity in farmers' arrangements.
	
	4. Draw a second large circle around the first circle.
	
	5. Ask participants the following:
	
	  a. What other activities apart from the SAI technology need to be done during the same time?
	
	  b. Are there important events during the same time?
	
	  c. Who is mainly involved in this activity (men, women, children)?
	
	6. Record activities in the second circle and add who is involved in them.
	
	7. Initiate a discussion on the following questions:
	
	  a. What are the differences between men's and women's workloads in this specific period of the year? What about girls and boys?
	
	  b. Are there activities that women (or girls) are doing that men (or boys) could also do? Are there other activities that men (or boys) are doing that women (or girls) could also do? If yes, which? What would be the result of more cooperation? If no, what hinders men from engaging in women's activities (or vice versa)?
	
	  c. How can workloads be shared more fairly?
	
	  d. Are there people in the community who would support more equal labor sharing? If so, who?
	
	8. Add questions that relate to the specific results and contexts.

Figure 5 (in Swahili) shows that the creation of *fanya juu* terraces takes place in August. It coincides with cleaning fields, post-harvest processing, house building, firewood collection, maintenance of graves and marriage activities. Men respondents indicated that all activities are done by men and women, except for post-harvest processing (only women and girls) and house building (only men).

Calendar in Swahili, from a men's group in Kongwa, Tanzania, August 2019. Photo credit: Jacqueline Rugalabam/IITA.

Figure 5 ▶ Results for a technology-focused seasonal calendar.

An alternative tool is offered by Jost et al. (2014). It establishes an overview of the whole year with a focus on specific agricultural crops. Detailed instructions are provided.

⟴ Considerations for implementation

A seasonal calendar provides a useful overview of labor demands across the year, but quantifying labor is not the main goal. Quantifying the time spent on tasks over a whole season is difficult, due to problems of recall. Asking participants at harvest time to recall the time spent on land preparation, planting and weeding is not likely to provide accurate data, especially in a group setting. Stakeholders in Malawi cautioned that the recall period should be limited to no more than two months after the end of the growing season. Alternatives to distant recall include ethnographic research using direct observation, carrying out multiple interviews during the farming season and training participants to record time use in a journal. All of these require significant investments of time. If one-time recall is the only option, it would be best to walk with farmers to particular fields soon after the harvest and ask them to try to recall how many days (or half days) they spent doing major tasks in that place over the growing season (noting how many people were involved, by gender and age). Measuring the area of the field with a Global Positioning System (GPS) device allows for calculating hours per hectare on tasks, which can be compared with published values.

Activity profile

⟴ Introduction

At the household level, agricultural, domestic and other tasks are often allocated to certain gender and age groups. For instance, land preparation may be seen as a 'men's task', while harvesting is left to women and children. Such allocation processes have the potential to create unequal labor burdens. SAI may produce shifts in the allocation of tasks that can be to the advantage or disadvantage of certain household members. The activity profile is a useful tool for understanding how household members share specific tasks and what effects SAI may have on the division of labor.

Decision-makers who want to employ this tool should establish in advance how focused or how detailed the information about tasks should be for their purpose. Box 3 illustrates a more comprehensive approach to data collection. The template generates an overview of gender and age roles in field activities for various crops, in different livestock production processes, in household production and in off-farm labor. Although the focus here is on unpaid household labor, it could be expanded to include community work (through additional rows) or the gender and age of hired workers (through additional columns).

Box 3 ▶ **Example of a comprehensive activity profile template**

	Men	Women	Boys	Girls	Comments
Crop/field 1					
Activity 1					
Activity 2 etc.					
Crop/field 2					
Activity 1					
Activity 2 etc.					
Livestock – animal species 1					
Task 1					
Task 2 etc.					
Livestock – animal species 2					
Task 1					
Task 2 etc.					
Household production					
Task 1					
Task 2 etc.					
Off-farm production					
Task 1					
Task 2 etc.					

A more focused activity profile limits itself to specific labor processes. When embedded in participatory data collection, it allows engagement of farmers in in-depth discussions on labor allocation. Table 4 and the facilitation steps below relate to such a focused activity profile. The template presented in Table 4 was used for the investigation of maize leaf stripping, a SAI technology, where farmers harvest lower maize leaves early in the production process to supplement livestock feed and increase maize grain productivity. Figure 6 shows the results for one focus group.

Table 4 ▶ Example of an activity profile template used in an investigation of maize leaf stripping

Labor step	Adult men	Adult women	Boys	Girls	(Additional group)
Planting: dibbling					
Planting: seeding					
Fertilization					
Weeding					
Harvesting: breaking cobs					
Harvesting: gathering cobs					
(Additional tasks)					
Cutting pasture					
Cutting maize leaves					

In preparation for an activity profile exercise, be it comprehensive or focused, facilitators create a template with the activities as rows and the household members (or groups of members) as columns. The response to whether an age or gender group is engaged in a task is binary (yes or no). Further insights can be produced by adding the amount of time different groups invest in certain tasks (see facilitation steps, below). The activity profile template can be integrated into survey questionnaires or used in focus group discussions or individual semi-structured interviews. It is important to remember that the tool only captures tendencies. There may be large variations among households and communities that have to be considered.

SAI decision-makers may use activity profiles to:

- understand household labor roles (in relation to gender and age), and potentially unequal labor burdens

- find out how technologies impact upon labor allocation with benefits for which household group

- identify tasks that burden women and can be alleviated through labor-saving technologies

- plan project activities at times when both men and women are not occupied with productive, reproductive or other tasks

⇴ Facilitation

The facilitation steps shown in Box 4 relate to a focused activity profile for a specific labor process. Apart from giving information on who does what (yes for involvement, or no for non-involvement), respondents are also requested to estimate the amount of time each gender and age group invests in certain tasks.

Box 4 ▶ Facilitation of the activity profile

Exercise	Activity profile (focused; embedded in focus group discussion)
Time	45–60 minutes (depending on the number of tasks)
Objectives	To capture labor allocation and unequal labor burdens of different household members
Preparation	1. Prepare a template with tasks in the rows and gender and age groups in the columns
	2. Translate into the local language and add illustrations to facilitate the inclusion of less literate respondents Invite men and women for separate discussions and prepare two venues
	3. Engage a man facilitator for the men's group and a woman facilitator for the women's group
Materials	Template, enough beans (or stones), marker pens and a recording device (or note-taker)
Facilitation	1. Welcome participants and introduce them to the objective of the exercise.
	2. Ensure confidentiality, request informed consent for recording or note taking.
	3. Introduce participants to the template. Go through the tasks in the rows. Ask if any labor step has been forgotten and needs to be added. Introduce participants to the social groups in the upper row. These are household members of different gender and age. Ask if any group of household members has been forgotten and needs to be added. Make additions, if needed.
	4. Introduce the scoring process: each participant receives the same number of beans/stones and scores individually. Those given to each participant represent the total time needed to accomplish a given task in their household. Each participant is then requested to allocate beans/stones to the social groups (mentioned in the columns). The allocation should be proportionate to the labor time invested by these groups in their individual households. Each participant should be given at least one bean/stone per social group to allow for an even allocation in case labor is shared equally.
	5. Start with the first task. Cover lower rows with a large piece of paper. Distribute the same number of beans/stones to each participant – eight for example, with two each for four household groups: adult men, adult women, boys, girls):
	a. If they perceive that all four groups invest the same amount of time in this task, explain that they can place two beans/stones in the respective box for each group.
	b. If they perceive that one or several groups invest more time in the task, explain that they can place more beans/stones in the respective boxes. The allocation is up to each individual. There is no need for consensus in the group if division of labor varies between households.
	6. When all participants have allocated their beans/stones, ask why they have allocated more or less to certain groups.
	7. After scoring and discussion, count the total numbers in each box and record the results on the template.
	8. Repeat for each task until finished, then have a discussion of the overall result using these questions:
	a. Why are certain tasks shared more equally? Why are certain tasks assigned to specific groups?
	b. What are the results of this labor allocation for each household group?
	c. Are there households that have more equitable labor sharing? How? Why?
	d. If an SAI technology is included in the template, does it increase/decrease the labor of certain groups? How?
Additional information	If this exercise is conducted in several communities, the overall results for men and the overall results for women are collated separately for comparison.
	The above facilitation steps can be adapted for individual semi-structured interviews.

Figure 6 illustrates what the results may look like. The template (Table 4) was used with a group of men farmers in one community of the Upper East region in Ghana. It shows that men invest more time in dibbling as compared to women. Women, on the other hand, are more engaged in seeding, the second task on the template. Boys' and girls' involvement in different tasks varies. The maize leaf stripping technology (last row at the bottom of the template) is implemented by adult men and boys, but not by women and girls. In comparison to the common practice (cutting of pasture; last but one row at the bottom of the template), this SAI technology has not led to shifts in the division of labor.
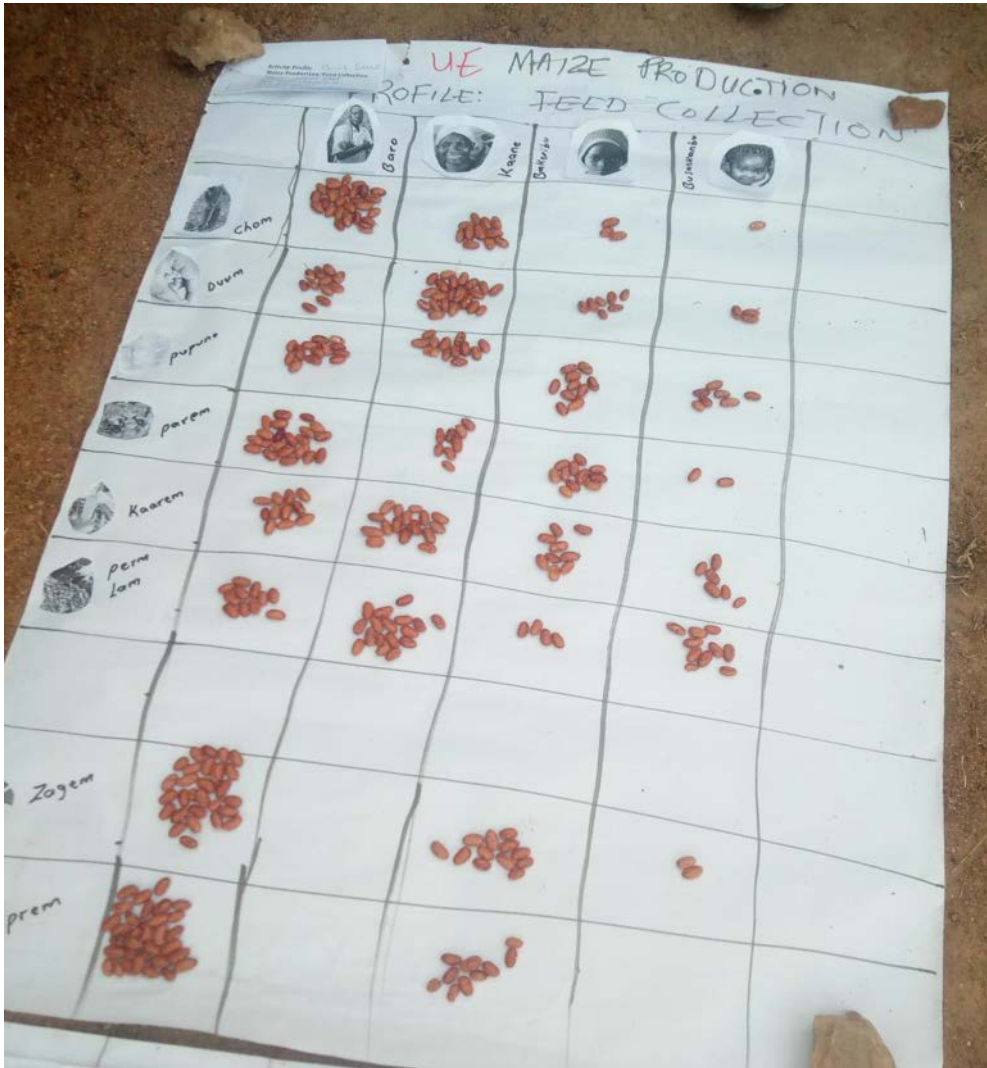
Results from a men's group, Upper East, Ghana, January 2019. Photo credit: Ignatius Tindjina/IITA

Figure 6   ▶   Results of a focused activity profile exercise

⮑ Considerations for implementation

The discussions during the exercise provide valuable information in respect to what participants think about the various tasks and may indicate other conflicts or challenges not captured directly by the exercise. For this reason, it is important to take detailed notes or to record the conversations and transcribe them for more detailed analysis.

Drudgery score exercise

⊝ Introduction

Asking about activity and time allocation alone may not be sufficient for understanding imbalances in workloads across gender and age. This is because the perceived drudgery of labor processes is not accounted for. For this reason, Africa RISING adapted a drudgery score method that stems from ergonomic studies. It focuses on farmers' perceived drudgery of a SAI technology in comparison to locally common practices (Fischer 2022). The drudgery tool can be employed as a participatory exercise or included in surveys (for instance, midline or endline surveys). In any case, it needs to be combined with activity profiles (Fischer et al. 2019b). Below, detailed facilitation steps are presented for the participatory exercise, and how the drudgery score can be applied in survey research using the example of maize shelling.

SAI decision-makers may use drudgery scores to assess whether a SAI technology increases or decreases perceived drudgery for men and women farmers, or for farmers of different age groups. Drudgery may be measured for a certain labor step or for the whole production process, in comparison to conventional practices. Alternatively, SAI decision-makers can use drudgery scores to select SAI technologies that are seen as less labor-intensive, especially by women, who often already carry a heavy labor burden.

⊝ Facilitation

In separate groups, adult men, young men, adult women and young women farmers compare a SAI technology to a selected local practice. Figure 7 and Table 5 show a comparison between maize monocropping and the maize/cowpea living mulch technology promoted for intensification.

Box 5 ▶ Facilitation of a drudgery score exercise

Exercise	Participatory drudgery score exercise (Fischer 2022)
Time	45–60 minutes (depending on the number of labor steps)
Objectives	To assess the perceived drudgery involved in implementing a sustainable agricultural intensification (SAI) technology as compared to a conventional practice
Preparation	1. Establish an activity profile to capture labor steps (conventional practice and SAI technology), and information on how tasks are shared among household members or taken over by hired labor. Instructions on how to do this are available at: **https://hdl.handle.net/10568/100149** (Fischer et al. 2019b) 2. Prepare one large template with four columns (see template below). The number of rows depends on the steps in the labor process. Labor steps are indicated in the language of the community and illustrated by pictures (to support the inclusion of less literate community members) 3. Invite farmers who have experience with the SAI technology for discussions, separated by age and gender 4. Prepare four venues (one for the adult and one for the young women's groups, one for the adult and one for the young men's groups)
Materials	Template, enough beans or stones and a recording device or note-taker

Facilitation	1. Welcome participants and introduce them to the objective of the exercise.
	
	2. Ensure confidentiality, request informed consent to recording or note taking.
	
	3. Introduce the template, the two practices to be compared and the labor steps for each practice. On the template, the labor steps for one technology are on the right and those for the other are on the left.
	
	4. Introduce the stepwise scoring process. One labor step at a time, each farmer is given an even number of beans/stones to allocate to a labor step under both technologies, more meaning more drudgery perceived under this technology.
	
	5. Start with the first labor step. Cover lower rows with a large piece of paper. Distribute an even number of beans/stones to each participant, e.g. 10 each.
	   a. If participants perceive no difference between the practices in terms of drudgery, they can place five beans in the respective box for each technology.
	   b. If they perceive one practice to be more labor intensive, they can place more beans/stones in the respective box. The allocation is up to each individual.
	   c. It is not realistic to place none at all in any box because all activities involve labor.
	
	6. When participants have placed their beans/stones, ask why they have allocated more or less to one or the other technology.
	
	7. After scoring and discussions, count the total number in each box and record it in the data table.
	
	8. Repeat with each activity in the table until finished, then have a discussion on the overall result using these questions:
	   a. Why are certain labor steps more or less labor intensive?
	   b. For whom are they more labor intensive? For whom are they less labor intensive?
	   c. Does the SAI technology increase/decrease the labor of women?

Exercise	Participatory drudgery score exercise (Fischer 2022)
Additional information	This exercise assumes that basic labor steps are roughly the same for both practices. Where the SAI technology requires completely different labor steps, it cannot be compared in a stepwise manner with the conventional practice. In this case, it can make sense to compare different sets of tasks that are meant to meet the same objective. For instance, in conventional practice, weed control is achieved through plowing, hoeing and hand weeding, while in conservation agriculture the same objective is met by spraying herbicides. If the exercise is conducted in several communities, the overall results for each group (adult men, young men, adult women and young women) are collated separately for comparison.

Participatory drudgery score exercise template.

Conventional practice		SAI technology	
Labor tasks	Drudgery score	Drudgery score	Labor tasks

Figure 7 and Table 5 show the results of an exercise conducted with women in Ghana. Participants found that maize monocropping involved less drudgery than maize/cowpea living mulch, except for harvesting.

Results from a women's group, Upper East, Ghana, February 2019. Photo credit: Esther Wahabu/IITA.

Figure 7 ▶ Results of a participatory drudgery score exercise

Table 5 ▶ A participatory drudgery score exercise from Figure 7

Maize monocropping		Maize with living mulch	
Labor tasks	**Drudgery score**	**Drudgery score**	**Labor tasks**
Planting maize	23	67	Planting maize and cowpea
Fertilization	19	71	Fertilization
Weeding twice	23	67	Weeding once
Harvesting	56	34	Harvesting

⇥ Drudgery scores in survey research

An alternative to the participatory exercise presented above is the inclusion of drudgery in a survey questionnaire. To carve out age and gender differences, it is important to sample a sufficient number of young people and adults, men and women, household heads and non-heads alike. More information is available in standards for sex-disaggregation for gender analysis (Doss and Kieran 2014).

As a first step, an activity profile of the labor process in question needs to be established (see instructions above for activity profiles). As an example, the activity profile for maize post-harvest processes below contains 10 labor steps, as well as information on who in the household is most likely to be involved in them (Table 6). The profile reveals that women and children often shell by hand, while mechanized shelling is carried out by men. This constitutes a shift of labor responsibilities from women to men in the process of mechanization. However, the activity profile does not reveal how respondents perceive the drudgery of shelling by hand or stick (as common practices) as compared to mechanized shelling (as a technology promoted for SAI).

Table 6 ▶ Activity profile for maize post-harvest processes in central and northern Tanzania

Post-harvest process	Who in the household is involved?
De-husking of maize	Women/children
Transport of unshelled maize	Men/young men
Drying of maize in homestead	Women/children
Shelling of maize by hand	Women/children
Shelling of maize by stick	Men/women
Shelling of maize by machine	Men/young men
Drying of maize after shelling	Men/women
Transport of shelled maize to storage	Men/young men
Grain management	Men/young men
Grain marketing	Men

Source: Fischer et al. (2021b).

As a second step, a question was integrated into a survey to measure differences in the perceived drudgery between shelling by hand, by stick and by machine (Table 7). Respondents were given 10 beans for each shelling method separately. They were requested to assign beans to each method depending on the drudgery they perceive when employing it, ranging from one bean for the least tiresome, to 10 beans for the most tiresome. Survey results for this question were sex-disaggregated following the standards of Doss and Kieran (2014).

Table 7 ▶ Drudgery score question in a post-harvest questionnaire

Shelling method	Drudgery score (1–10; 1 for least tiresome, 10 for the most tiresome)
Shelling by hand	
Shelling by stick	
Shelling by machine	

Source : Fischer et al. (2021b).

As a third step, results from the activity profile and drudgery score were combined. They showed that both men and women perceived machine shelling as the least tiresome method, and manual shelling as the most tiresome method (for exact results, see Fischer et al. 2021b). Since women and children frequently shell by hand, they would gain most labor relief from mechanization. Instead of using the placing of beans to measure drudgery, pictures can also be used to illustrate the perceived level of exertion (see Jagoe et al. 2020). This may be helpful when working with less literate participants.

⮥ Considerations for implementation

Drudgery score exercises can be implemented in three ways:

- Head-to-head comparison of two technologies. For each labor step, respondents are given an even number of beans which they allocate to the two technologies (different amounts depending on level of perceived drudgery, or the same amount of beans if the perceived drudgery is equal). An example is the participatory drudgery exercise presented above (Figure 7 and Table 5).

- Comparison of drudgery for several technologies with separate scoring. Farmers give each technology a score between 1 (least tiresome) and 10 (most tiresome), to provide insights into the perception of drudgery for several technologies, as in the maize shelling example above (Tables 6 and 7).

- It may also be useful to ask participants about the relative drudgery of different labor steps for each practice separately. This makes it possible to identify the most tiresome (or easiest) tasks within one process. For maize shelling, such a comparison is available in Fischer et al. (2021b). For example, manual shelling was rated as almost equal to weeding (perceived as the most tiresome labor steps). Having participants provide information about the perceived drudgery of each task is a way of complementing the head-to-head comparison or ratings across technologies. This additional information could be gathered before or after the comparison of different practices. However, it is critical to explain clearly what information you are looking for at each step, so that respondents provide accurate information.

B. Tools to assess agricultural resource access and use

The gender and youth balance tree

⊃ Introduction

This tool was originally developed as a the "Gender Balance Tree" by the Gender Action Learning System (GALS) (Mayoux 2014). For the purposes of this guide, the tool has been turned into a "Gender and Youth Balance Tree" (GYBT) by adding youth-specific questions. The GYBT is an interactive exercise where participants draw a tree to symbolically represent the household (Figure 8). The work of various individuals in the household form the roots, and the rewards for each member make up the branches. Four household groups are considered when drawing roots and rewards: adult women, young women, adult men and young men.

The analogy of the household as a tree creates a powerful image of the need to work for the common good.

> *Often women and men do not work equally, leading to inefficient division of labour inputs to the tree. Women and men may not benefit equally from the fruits and unproductive expenditures may cause the tree to fall over. The household tree's trunk is often made to bend one way or the other because of inequalities in asset ownership and because decisions are not shared.s It is important that the forces acting on each side of the trunk are equal to help it to grow straight and help the flow of goodness from roots to branches.… Even if fertiliser is given to the roots, if this is done on one side only (e.g. training or inputs only for the men or if the forces acting on the tree are not made equal e.g. asset ownership), then the tree will just grow faster on one side and may fall over even faster. (Mayoux 2014, p. 55).*

This tool is suitable for obtaining basic information about various dimensions of equity within the household that relate to many aspects of SAI, such as labor, resource and income control, daily time allocation, and beliefs and perceptions. In general, information of this kind is often spread across various tools, many of which go into greater analytical depth. However, the GYBT exercise facilitates data collection in one go (Mayoux 2014) and may be a useful first step for decision-makers in understanding intra-household gender dynamics and how SAI interventions may have differential impacts across gender and age groups.

The GYBT is also a powerful awareness-raising tool, revealing gender imbalances to participants and creating space to outline strategies to address recognized issues (Figure 8). This is achieved by having participants circle the changes that they want to make on the diagram and to discuss them collectively, and results may inform concrete actions at household, community and other levels.

SAI decision-makers may use the GYBT to understand the responsibilities and time allocation patterns of various household groups. This can help decision-makers to better align SAI interventions with the priorities of women and youth, and to analyze how agricultural change will affect men and women differently. The GYBT can also be used to gain an insider perspective into the complexity of intra-household decision-making, especially regarding the allocation of benefits from various livelihood activities. This information can help decision-makers identify short-term and long-term strategic measures for adjusting the balance of responsibilities and benefits by gender and age, and improving the well-being of the whole household.

⟴ Facilitation

The GYBT exercise consist of three components: (i) vision journey; (ii) drawing of a tree by sub-groups formed among participants; and (iii) a group diagram. While it can be useful to undertake the exercise with a single household, it can also be done with community groups to gain a broader picture of the situation, with at least five members in each of the four groups (adult women, young women, adult men and young men). It is important to note that the GALS methodology relies completely on drawing. Note taking during discussions is therefore essential for documenting the meaning of symbols for subsequent analysis.

The first component consists of a homework-style activity called a vision journey, in which participants individually develop a vision for their households and community, describing the desired end point, followed by a description of the current reality. A day or more before the GYBT exercise, participants are given the task of drawing their hopes and dreams for their household and community, and should contrast that vision with the current reality. The bridge building exercise (Section 5) can provide a useful structure for the drawing. This paves the way to starting the GYBT exercise by providing a reference point and framework for examining gender and youth opportunities and constraints.

In the second component, participants develop a tree diagram in groups, by going through five basic steps. The materials required are a large sheet of paper and a set of colored markers for each group. In preparation, the facilitator must first form groups of adult men, young men, adult women and young women, and then explain the analogy of the household as a tree and how to go through the five steps of drawing a GYBT (Box 6). The groups should work as long as they need to, to develop their tree diagrams, including discussion on how to change it for improved balance (step 5). This typically takes 60 minutes. It is important for participants to develop their own symbols and drawings that represent the meaning of their responses.

> 66
> *The more people are involved in designing…, the greater the sense of ownership and local creativity, and hence likelihood the change process will be dynamic, sustainable and scaled up through community initiatives. (GAMEChange Network 2016).*
> 99

The third component is facilitated in plenary, starting with each group (adult women, young women, adult men and young men) presenting their GYBT diagrams, and will require about 40 minutes, depending on the discussions. As each group presents, a volunteer from each group draws the desired changes from each group on a new combined diagram. Using symbols, the number of groups desiring that change can be drawn in green. It is possible that some groups will have seen a change as already having taken place, which can be drawn in blue, or as not being desired, which can be drawn in black.

After the combined diagram has been created and the changes noted, plenary participants discuss the proposed changes and ask clarifying questions to encourage everyone to understand the results from each group. The facilitator then gives a brief summary of the findings, considering the similarities and differences between men and women, and between youth and adults. Mayoux (2014) gives the following guidance: "Good facilitation from the back means that there should be little for the facilitator to add. The aim is to inspire people to change in future, not to make either men or women feel guilty about past behavior." With the added youth component, the aim is not to make adults or youth feel guilty either. To conclude, the facilitator may consider a fun and engaging activity, such as developing a song that embodies plenary feedback from participants.

Box 6 ▶ Facilitation of the gender and youth balance tree

Exercise	Gender and Youth Balance Tree
Time	60 minutes in groups and 30–60 minutes in plenary
Objectives	1. To obtain basic information about various dimensions of equity within households 2. To raise awareness of gender imbalances and outline strategies to address the issues
Preparation	1. Invite at least five participants for each group (adult women, young women, adult men, young men) and explain the preparatory assignment (below) 2. Prepare a venue for the four groups
Materials	Flip-chart paper and marker pens

Facilitation	1. Component 1 – Preparatory assignment:
	
	Ask participants to develop a vision for their households and community, describing the desired end point, followed by a description of the current reality. They can use drawings or songs to summarize their hopes and dreams.
	
	2. Component 2 – Group work:
	
	Participants draw a tree for an average household in their community. See detailed instructions below.
	
	3. Component 3 – Plenary discussion:
	
	   a. Each group presents their tree diagram
	
	   b. A volunteer draws the desired changes from each group in a new combined tree diagram
	
	   c. Participants discuss the desired changes, asking clarifying questions
	
	   d. The facilitator provides a brief summary, noting differences across groups.

Steps[1]	1. Trunk: who is in the household?
	
	   a. Draw two lines in the middle of the paper for the trunk.
	
	   b. Put symbols for each member of your household inside the trunk using different colors for each gender, put dependents in the middle.
	
	2. Roots: who contributes what work?
	
	   a. Draw four roots for women (two for adults and two for youth) and four roots for men (two for adults and two for youth) on the respective side of the trunk in their respective color. Draw a fifth central root for joint activities.
	
	   b. On the outside root on each side, draw symbols for the activities that people of that age and gender in your household perform alone for themselves.
	
	   c. On the inside roots, put activities that people of that age and gender perform alone for your household.
	
	   d. In the central root, put those activities that both women and men do, putting the symbol on the side of the gender that does most of such work.
	
	   e. Circle in black the activities you would like to change in your household. Circle in blue the activities you want to keep as they are.

3. Branches: who gets what fruit?

    a. Draw branches corresponding to each root and a central branch for joint expenses in your household.

    b. On the outside branch on each side, draw symbols for the personal expenditure of each person in your household according to age and gender.

    c. Household items that only one person pays for should be on the inside branch on each side.

    d. For joint expenditures, put symbols on the middle branch.

4. What is pushing the tree?

    a. On the respective side of the trunk put symbols for the following:

    b. Property that women and men own. Who owns the land? Who owns the livestock? Who owns the house?

    c. Types of decisions that women and men make. Which decisions are made by women only, which by men only and which are made jointly? Is one person always the decision-maker, or do they sometimes decide together?

5. Action: what do we want to change?

    a. Is the tree representing your household balanced? Who is doing more work? Who owns more property? Who has more income? And who contributes more to expenditures? Put a balance symbol representing the degree of gender balance somewhere on the diagram.

    b. Circle in blue the things that help the tree to balance, and so do not need to change.

    c. Consider how to make the tree more balanced in your household. Should tasks be reassigned or done jointly? Should certain expenditures be cut? What property should be shared? With regard to income-earning activities, can income be increased or time spent decreased?

    d. Identify five action commitments: the things that more (or less) are wanted to make the tree balance. Mark these with green circles (representing unripe fruit or tubers), crossing out the original symbol with black if necessary.

[1] Source: Adapted from Mayoux and Oxfam Novib (2014).

What young women
spend for household

What men, women
and youth
spend for the
household

What young men
spend for household

What young women
spend for themselves

What young men
spend for themselves

What adult women
spend for household

What adult men
spend for household

What adult women
spend for themselves

What adult men
spend for themselves

Step 3: Branches – Who gets what?

Step 4: Forces – Property and asset ownership, decision-making

Step 1: Trunk – Who are the house-hold's members?

Step 5: Balance – Draw a symbol representing the degree of gender balance

Step 2: Roots – Who does what?

What adult women do
to earn an income

What adult men do
to earn an income

What adult women do
for the household

What adult men do
for the household

What young women do
to earn an income

What young men do
to earn an income

What young women
do for the household

What young men do
for the household
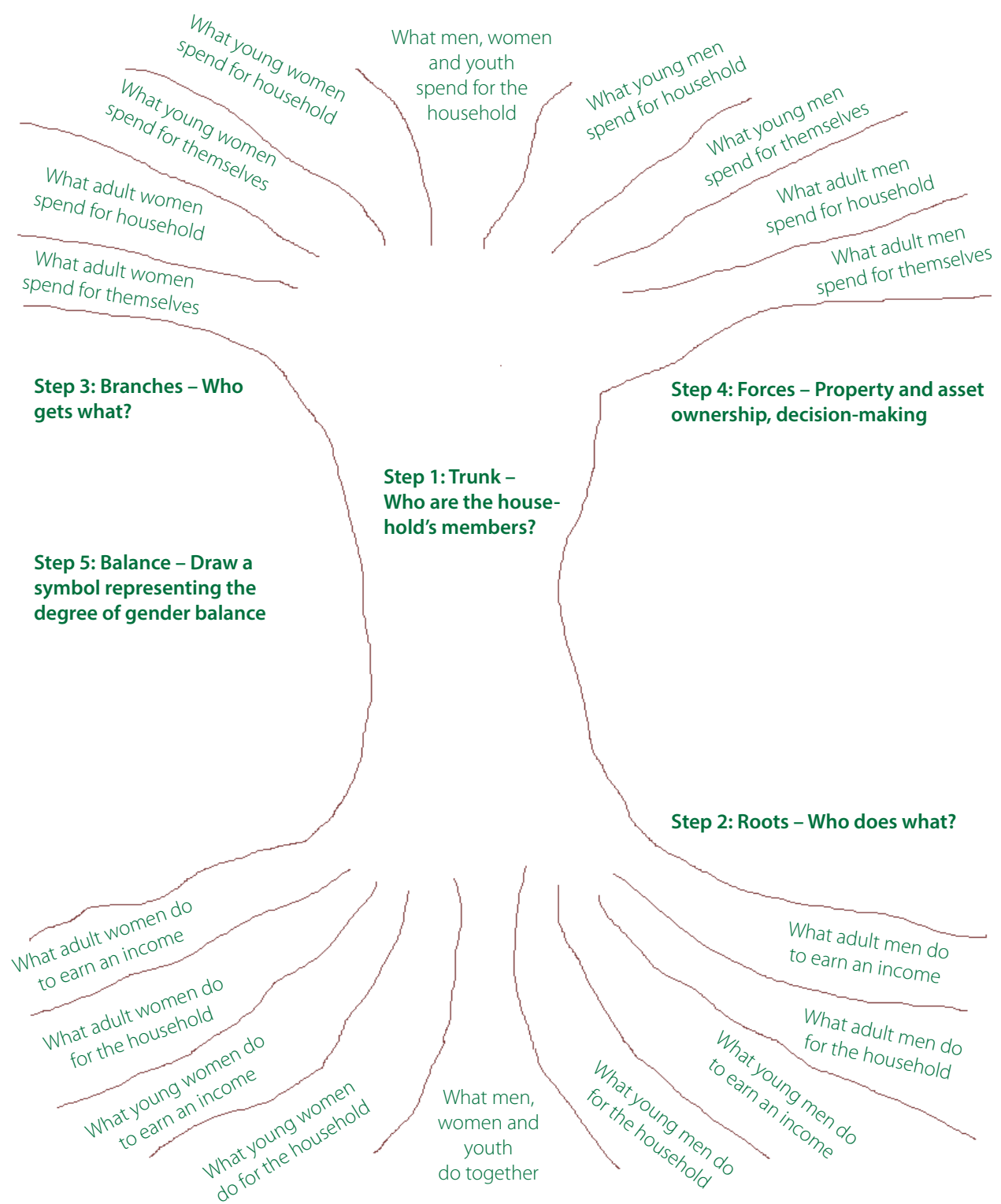
What men,
women and
youth
do together

Figure 8 ▶ Guiding questions for the gender and youth balance tree exercise

⊕ Considerations for implementation

The GYBT is a tool that provides decision-makers with an overview of many gender- and youth-related issues. Organizations that tested the tool in Ghana found that it raised issues about how some men spend money on alcohol and girlfriends. In Malawi, organizations found it useful for showing who in the household is participating in which activities and who is benefiting. Facilitators who tested the tool reported the challenge of limited space for participants to draw the access and control of resources, and the difficulty of drawing symbols for the many activities and expenditures.

The GYBT tool supports a gender transformative approach by facilitating reflection on gender and youth inequities, and encouraging dialogue on how to balance the tree. Facilitators testing it in Ghana reported that they found it useful for encouraging conversations about the need to share tasks and to increase women's access to land. During workshops, this tool was found to be very effective, as participants reflected on their own intra-household dynamics.

The GYBT can be adapted for survey questions to quantify differences between intervention and control households (Farnworth et al. 2018). Examples of the application of this exercise to agricultural change can be found in Mayoux (2012) and Sita and Herawati (2017). Follow-up interviews can then be used to gather more detailed information. For example, a tool called 'ideal man and ideal woman' (Feenstra and de Zwaan 2015) can also be used to generate discussions about changes in expected gender roles.

Participatory mapping

⊕ Introduction

For equitable SAI there are many spatial aspects of planning, such as deciding on the location for new roads, markets, storage facilities or irrigation schemes. Participatory mapping helps to inform those decisions by obtaining local information about agricultural resources (land, livestock, water), including use, access, control and ownership. Mapping can be done at various spatial scales, such as mapping how materials flow across a single farm, mapping soil fertility across the community, or even mapping water allocations across the landscape in large-scale irrigation schemes. Choosing appropriate mapping scales is important because different stakeholder groups, power relations and issues among them, and other contextual factors that shape SAI decisions and outcomes.

As one of the most widespread PLA methods (Chambers 2006), participatory mapping is often carried out with separate groups in a community to understand each group's perspectives. In terms of equity, one of the primary goals is to use maps to detect differences in resource use and priorities. For example, women in a resettled village in Zimbabwe focused their map on the home area, while men focused on roads, pastures and fields (Goebel 1998). Groups making maps can be divided into any interest categories such as age or gender, to better understand the resources that each group uses.

Map making is a form of power to symbolically represent reality, with many decisions (often made unconsciously) about what to emphasize and what to leave out. Brinhurst et al. (2017) argued that participatory mapping should go beyond its use as a data collection tool, to become an empowerment tool in itself. Chambers (2006) emphasized how the mapping process can build confidence in community members as they realize their potential to represent their reality to outsiders. Beyond that, results of mapping can lead to collective action. Farnworth et al. (2013) documented a case in Kenya where women HIV caregivers used participatory mapping to document where widows had been forced to leave their homes and lost access to land. They were then able to initiate a process to help resettle the widows. Thus, participatory mapping is not only a key tool for wisely planning interventions for SAI, as it can also play a critical role in transformation for improved equity.

⟴ Facilitation

Participatory mapping can be implemented in various ways with the specific method chosen depending on the objectives of the stakeholders involved and the resources available, including time, finances and technical skills (IFAD 2009). Here how to facilitate the most common type of participatory community mapping is explained by using local materials to create a ground map, which can then be transferred to paper. Detailed guidance on sketch mapping for gender equity can be found in the community mapping toolkit of Concern Worldwide (2016b). This concludes with a brief description of options that require more technical skills. Local knowledge can be combined with satellite images or aerial photographs to create base maps for analysis with geographic information systems. For any type of project, decision-makers should reflect on the spatial aspects of interventions and to consider how men and women, adults and youth may use relevant resources differently across space and scales. If there are significant spatial elements and possible inequities across the landscape, participatory mapping is a powerful tool to reveal them.

Regardless of the methods used, participatory mapping requires a significant amount of preparation (Box 7). The first step is to develop a clear objective for carrying out the exercise. A general purpose could be simply to understand the farming systems in the community. At the other extreme, a very specific purpose could be to identify the best location for a project element such as infrastructure (e.g. water points, training centers or markets). Based on objectives and equity issues, the organizers should decide how groups should be divided for making maps. Separating men and women, adults and youth would create four groups, a feasible number that would provide a range of perspectives for a general exploration. Further division may be needed in some situations (e.g. herders and farmers).

Before implementing the mapping exercise, it is important to work with community members to ensure successful interaction. Organizers need to build rapport and trust with community members to secure participation and to motivate them to give time and effort for the exercise. It is especially important to ensure that the location, date and time are convenient for each group so that no one is systematically excluded. Additional logistics that may be worth considering include offering refreshments, gathering local materials ahead of time, and inviting local authorities as appropriate.

Box 7 ▶ Facilitation of a participatory community mapping exercise

Exercise	Participatory mapping
Time	4 to 6 hours or more
Objectives	To obtain local information about agricultural resources (land, livestock, water), including differences in use, access, control, and ownership by age and gender
Preparation	1. Write out a clear objective for the mapping exercise 2. Identify the groups that should create separate maps 3. Work with the community to identify an appropriate location, date and time
Materials	Ask participants to collect sufficient local materials of their choice (sticks, rocks, beans) for creating the ground map. Bring flip-chart papers and marker pens to copy the result onto a paper map.
Facilitation	**Implementation:** 1. Explain the objectives and the process; divide into groups 2. Each group creates their base map on the ground using local materials 3. Facilitators ask probing questions to add visual elements to the base map 4. Each group presents their map to the community 5. Discuss differences between the maps and what they reveal about inequity 6. Ask each group to transfer their map to paper 7. Discuss the implications of findings for relevant decisions **Follow-up:** 1. Write up notes and reflections from the exercise and make images of maps 2. Share findings with stakeholders including the community 3. Use maps to guide the equitable sustainable agricultural intensification (SAI) process 4. Use maps to document future changes in the community related to SAI

On the day of a participatory mapping exercise, it is important to clearly communicate with participants the purpose of the maps and what information should be included. Make sure each group has a sense of what the boundaries are for this exercise so that the maps will be comparable.

After division into groups, each creates a base map on the ground with local materials representing the primary features of the landscape, such as roads, buildings, rivers and cropland (Figure 9). The participants should decide themselves how to create the map, not the facilitator, who should be there as a facilitator and note taker. The final product does not need to look like a formal cartographic map, and it is expected that the map will be adjusted as it is built. In fact, one of the advantages of mapping on the ground with objects is that they are not as permanent as putting ink on paper, making it possible to stretch or reorient the map with relative ease. Facilitators should pay special attention to group interactions during mapping and record any divergent perspectives on landscape resources.

Once the main features are in place, probing questions add visual elements to the base map. For example, different colored markers (stones or beans) can be placed on the map to represent information such as the gender of those responsible for each field, the fertility of the land or the crops grown. Probing questions should be developed in advance, based on the objectives of the mapping exercise. When information is being added, encourage group members to cross check that everything is correct and located in the right places. Information from other PLA tools such as wealth ranking or transect walks can also be added to the map.

Upon completion of ground maps, each group should present their map to the other groups in a plenary session. The focus of those presentations should be to understand each other's perspectives, not to judge which group made the best map. In plenary, facilitators ask the community to identify differences across the groups that are relevant to the specific objectives of the mapping exercise. Dialogue and discussion of these differences can be very rich if well facilitated.

Thete, Malawi, April 2009. Photo credit: Phil Grabowski/World Renew.

Figure 9 ▶ Participatory village mapping

During or after the discussion, the final map for each group is transferred to a large sheet of paper (Figure 10), which can then be easily copied for the community to keep and for inclusion in a report. The paper map should include more information than the ground map, depending on the wishes of the groups. The exercise concludes with the implications of any findings for decisions being made about SAI. Was a location selected for a project element? What were the key lessons for organizers in regard to the local farming systems?
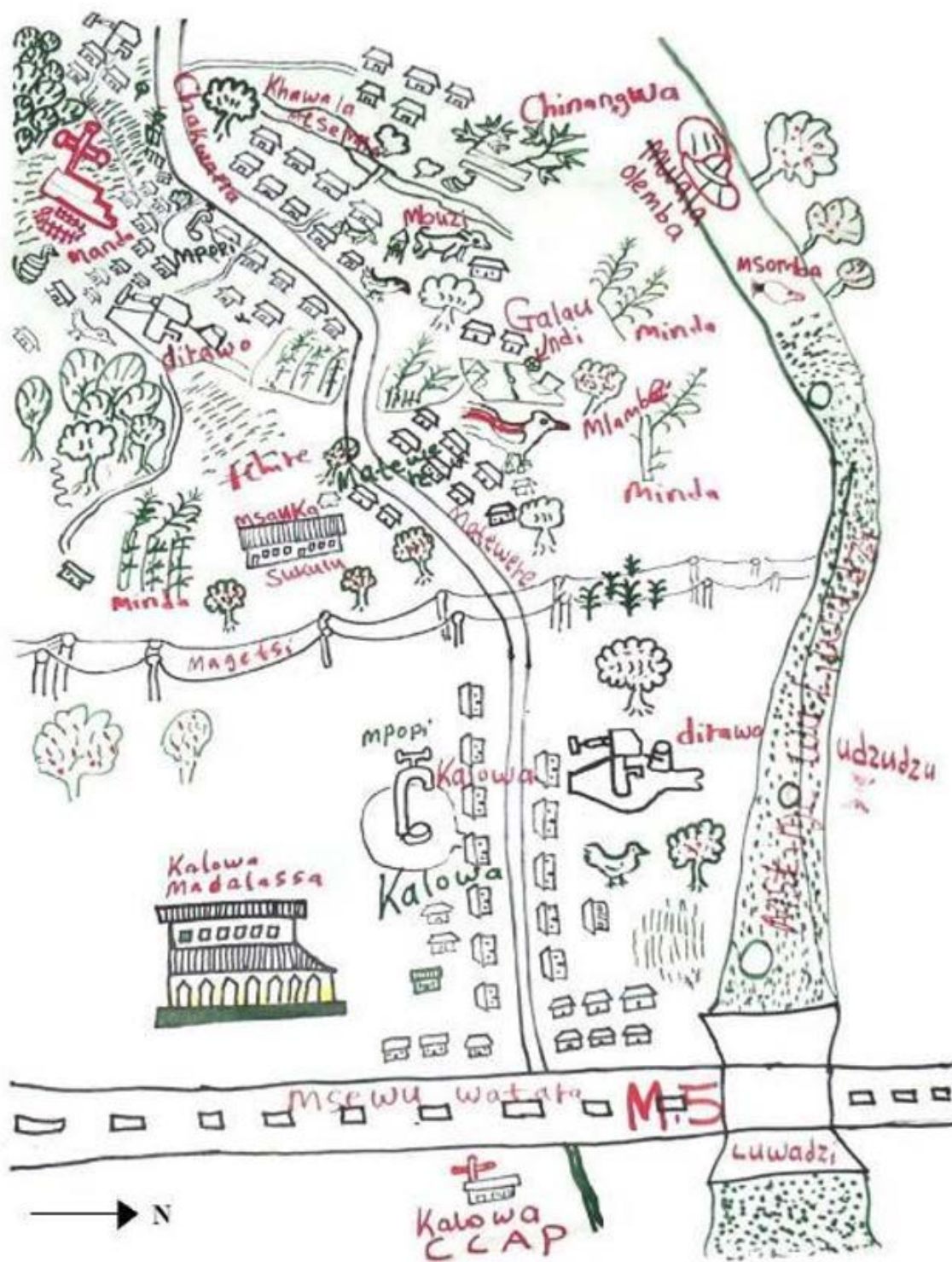
Salima, Malawi, July 2005. Photo credit: P. Grabowski/World Renew

Figure 10 ▶ Results of a participatory mapping exercise

Follow-up tasks include typing up the notes from all group and plenary sessions, and putting them together in a report with images of the maps. This report can then be shared with stakeholders who were not able to participate in the mapping exercise.

As with all tools, there is little value if the information collected is not actually used to guide decision-making for SAI. The report and maps should be processed and discussed in terms of how project interventions can be adjusted or changed for greater equity in the SAI processes.

Finally, the map can play a significant role in monitoring and evaluating changes in the community over time. Probing questions can be repeated each year to observe changes over time, using the same base map.

Technical adaptations of participatory mapping

Instead of having community members build a base map, facilitators can print and laminate aerial photographs or satellite images of community-managed areas. Community members can then respond to probing questions by drawing on the images with different colored markers. This approach was used to apply a gender lens to nutrition sources in the landscape in Zambia, such as crops, fish and wild foods (Estrada-Carmona 2014). Baker et al. (2015) used contour maps with communities to create three-dimensional relief maps that were then used in participatory exercises to obtain gendered perspectives on water uses, and used the information on land use for hydrological modeling maps.

Participatory mapping can also involve fieldwork by technical experts, such as surveyors and cartographers. This may be necessary if formal maps are required, to convince government officials, for example. This can be challenging to implement, however, due to limiting supporting resources and the wide range of potential applications (Brinhurst et al. 2017). Useful lessons learned from experience with participatory mapping exercises using formal maps are documented in 'Good practices in participatory mapping' (IFAD 2009). Adding gender and intergenerational inequity analyses creates another layer of complexity, especially when discussing contentious issues such as land rights. For example, the methodology developed for formalizing village mapping for indigenous forest rights includes extensive education beforehand, and advocacy after the maps are made (Rainforest Foundation UK 2015; Gilbert and Clench 2018).

Combinations of methods are also possible, which can allow for deeper insights. Westervelt (2018) combined remote sensing data with participatory sketch mapping, interviews and transect walks near a protected forest in Kenya to obtain a gendered perspective on land use changes over 30 years. The richness of participatory mapping, oral history and longitudinal forest cover images allowed the documentation of how gender relations are constantly being reconstructed, especially as production systems change. In this case, the economic importance of women's labor increased as farming increased and grazing decreased.

⮀ Considerations for implementation

The impact of participatory mapping depends to a great extent on how it is facilitated and how the underlying relationships influence data collection processes. Attitudes and behavior of facilitators are of critical importance for obtaining quality information and need to be aligned to local contexts to allow proper democratization of the process (Chambers 2006). Brinhurst et al. (2017) point to the philosophical drivers of the mapping process, that is, the emphasis on the process itself as the ultimate goal rather than the end products or tools used. The International Fund for Agricultural Development (IFAD) noted that the role of external intermediaries (especially development project managers or officers, NGOs and grassroots actors), the nature of the relationships that unfold among stakeholders doing mapping, and the existence of enabling and disabling political decision-making environments that determine the effectiveness of formalized participatory mapping processes (IFAD 2009).

The youth and land responsiveness criteria tool

⇒ Introduction

This tool is useful for analyzing institutional and informational barriers to youth accessing land for farming. It is adapted from the Youth and Land Responsiveness Criteria (YLRC) tool (Markicevic and Ying 2015). According to the Global Land Tool Network (GLTN), the YLRC tool represents an easy and practical approach to evaluating the extent to which land-related policies, frameworks and projects respond to the needs and concerns of youth, with regards to land as a production factor (Markicevic and Ying 2015).

The data from this tool can be used to understand the following:

- Various demands for land by each category of youth.

- Existing access to and control over land by young people and how they benefit from it.

- External constraints and opportunities affecting youth's land needs and use of land.

- Potential strategies for solving problems related to youth and land at various levels.

Using this tool does not solve any of land-related issues faced by youth, but it can help raise awareness of the problems and identify opportunities for creating greater equity in access to land and greater inclusion of youth in land allocation processes (Markicevic and Ying 2015).

There are many ways to implement the original YLRC tool, and the guidebook 'How responsive is your land programme to the needs of youth?' (Markicevic and Ying 2015) provides a detailed framework of questions across themes, as well as providing advice for ensuring a participatory process for youth empowerment. That guidebook and a related conference paper (Fairlie et al. 2015) give details from action research on youth and land in Nepal, Brazil, Zimbabwe, Kenya and Yemen. However, none of these case studies is focused on agricultural productivity. For this manual, we have adapted the tool to be used with a series of focus groups on youth access to agricultural land.

⇒ Facilitation

The YLRC tool can provide a great deal of information about young people's access to land in a short time. The simplest method is to facilitate five separate focus group discussions (Figure 11) with the following groups: community leaders, adults (men and women apart) and youth (men and women apart). These can be held simultaneously with a large group of facilitators and note takers, or sequentially with only one facilitator and note taker. After the data has been collected and analyzed, consider having a community meeting to share insights across groups or communities to stimulate dialogue on youth access to land.

Since land is an extremely sensitive issue, facilitators should not ask questions that seem likely to increase conflicts. Focus group discussions are not confidential, and participants may tell others what they heard in the group. Even if a group were to agree to confidentiality concerning topics such as discrimination or corruption, sharing of the results would require great care and discretion, and this tool may then not be appropriate. These are important topics that need to be discussed, but the facilitators must design the exercise to be constructive and must end the discussion if this is not possible.

Tete, Mozambique, November 2005. Photo credit: P. Grabowski/World Renew.

Figure 11 ▶ Young women focus group discussion

The following questions provide a starting point for inquiring about the access of youth to land. They are organized across the five themes of the YLRC tool. The questions should be adapted to fit the specific needs of the decision-making context, by adding or removing questions as needed (Box 8).

Theme 1   **Youth recognition and involvement in agriculture.** This is aimed at understanding how young people are seen, conceptualized and acknowledged. It serves to initialize the entire process of implementing the tool.

- What is the local definition of 'youth' with respect to agriculture? Is there an age range?

- What are the different 'types' of youth in this area (by gender, marital status, position in household, occupation, dependent/independent etc.)?

- What roles does each type of youth have in farming? How do roles change as people in the community progress from childhood to adulthood?

- What are the strengths that young people bring to farming?

- How are young peoples' farming needs different from those of adults?

Theme 2   **Land access and use.** This explores different ways in which young people access and use land.

- How are young people using land for agriculture in this community? Are there specific locations or types of land that young people use more?

- How do young people access land? How is it different for each category of youth? How is it different for different types of land?

- How difficult is it for youth to access land in this community? What makes it difficult? What makes it easy?

- What are the social norms regarding youth accessing land? Who would approve of making it easier for youth to access land? Why might some people disapprove?

Theme 3   **Land information.** These questions explore access to information regarding land issues, and how easy it is for young people to understand this information.

- How do young people get information about how to access land for agriculture? How do they get information about how and where to borrow, rent or buy land? How could information about all of these be made more easily accessible to youth?

- How is information about inheriting land shared in families? How do parents communicate with their children about passing on land to them? How is such information shared differently with boys and girls? How does information about land inheritance change as children mature and their parents age? How could families improve their communication about land inheritance?

Theme 4   **Land governance.** This is aimed at uncovering how young people can participate in decision-making processes relating to land, and when they can participate.

- How do young people interact with those who make decisions about land in the community?

- How are the voices of young people heard or not heard by decision-makers in the community?

- How could youth participate to a greater extent in processes related to land issues?

Theme 5   **Land policies.** This component analyzes land policies and programs to define their capacity to integrate youth in programmatic activities.

- How do national or local land laws and policies address youth needs?

- Which institutions or associations are in place to identify and promote the needs of youth in relation to land? How do they identify and promote the needs of youth for land?

Box 8 ▶ Facilitation of a focus group for inquiring about youth and land issues

Exercise	Focus group on youth and land issues
Time	1.5 hours for each focus group discussion (can be done simultaneously if enough facilitators are available)
Objective	To understand the institutional and informational barriers to youth accessing land for farming
Preparation	1. Adapt questions to the local context and the project's focus (the focus group questions below were used in Golomoti, Malawi) 2. Prepare five venues for the five groups 3. Invite at least five participants for each group (community leaders, adult women, young women, adult men, young men)
Materials	Question guides, notebooks and voice recorders (if recording for transcription)

Facilitation	Introduce the exercise by explaining that you want to learn about youth and agriculture in this community. Then facilitate discussion among the participants on the topics of interest using the questions as a guide.
	
	1. How are young people involved in agriculture?
	    a. What responsibilities do young people have in the fields, with animals, and with processing and marketing?
	        i. With animals?
	        ii. With processing and marketing?
	    b. Are they involved in agriculture off the family farm, e.g. agricultural day labor?
	    c. How is it different for young men and young women?
	2. What do is meant by 'youth'?
	    a. Who is included? Age? Married?
	    b. What categories of youth are there?
	3. What are the most important ways that being in the category of a youth affects a person's involvement in agriculture?
	4. How do young people access land? How is it different for each category of youth?
	    a. Is there a difference in this respect between upland fields, and wetland gardens, grazing land and forest land?
	    b. What about village land, for example, in the village (for building a house, starting a business or practicing sports)?
	5. How do young people get information about how to access land (borrowing, inheriting, renting, buying)?
	    a. How do parents communicate with their children about agriculture and land as they make the transition from complete dependents to independent adults?
	6. How do young people interact with those who make decisions about land in the community?
	    a. How are their voices heard?
	    b. In what ways are their voices not heard?

7. Are you aware of ways in which access to land for young people is affected by the laws of the country?

   a. What have you do you know about Malawi's national land law? How could it affect your community?

8. How difficult is it for youth to access land in this community?

   a. What makes it difficult? What makes it easy?

   b. Who would approve of making it easier for youth to access land? Who would disapprove?

⊃ Considerations for implementation

The questions listed above provide a starting point for learning about youth access to land. Additional data collection may be necessary for a more complete understanding of the various challenges and opportunities. This could include such methods as a household survey on how land is inherited, or participatory mapping of where youth farm, and whether the land is borrowed, rented or owned.

Of critical importance is using a participatory framework to allow youth perspectives to inform and guide the process of collecting data and applying that data to SAI for more equitable benefits. Sharing information with communities where data is collected is an important part of the process. As mentioned above, care needs to be taken to avoid sparking conflicts, including protecting the confidentiality of respondents, especially any who may be seen as complaining about community leaders.

C. Tools to assess equity impacts of technology and market changes

Ratings of technologies

⊃ Introduction

One of the best ways to understand the gender perspectives of agricultural technologies is to ask men and women separately about how they evaluate each of a set of options, such as markets, crops or agricultural technologies. There are many ways to achieve this goal, but one of the most informative is to ask participants to rate options by scoring them according to a set of criteria. In participatory evaluation, this is often achieved in a group visual exercise by drawing a matrix on the ground with objects representing options and criteria and having participants place stones or beans in each square to represent their scores. Similar gendered ratings have been used extensively in participatory plant breeding and in many other contexts (see Bellon 2002 for an excellent example).

⊃ Facilitation

The first step is to develop the criteria through group interviews with each gender and age group. Ask participants to identify factors that affect their opinions about the options being compared, such as the most important traits of a set of agricultural technologies. For example, if comparing new bean varieties, the facilitator could ask what characteristics they look for in beans. Potential responses could be yield, time to maturity, pest resistance, color, cooking time, flavor or nutritional value, and these responses might vary across gender and age groups. The facilitator can use brainstorming to develop a list with each group and then use multi-voting (Section 5) to prioritize the list. If the list is long, the facilitator can ask members of each group which criteria they feel are least important, and these can be left out of the next step. Facilitators can also make sure that criteria of interest to decision-makers are on the list, explaining why decision-makers want participants' feedback on those issues.

The next step is to have participants in each group to rate each technology for all the criteria they found to be important. This is typically accomplished by creating a matrix on the ground or on a large sheet of paper, with the options and criteria as columns and rows (Figure 12), and placing physical objects on the matrix to assist participants with low levels of literacy.

Give participants a pile of markers and ask them to put some in each square to evaluate the options according to whatever scale seems most appropriate (e.g. 1 to 5, or 1 to 10). During the process, the facilitator should encourage discussion of the scores and take note of areas of disagreement and the reasons for these.

	Egg Plant	Lettuce	Toma-toes	Sorrel	Barambi Green	Nana	Bitter Tomato	Karen Kareng	Cassawa	Okra	Onions	Cabbage	Hot Peppar	Mango	Sweet Peppar
More durable in terms of Storage															
More cash yielding															
More blood giving															
More energy giving															
Consumed most															
More marketable															
Less water requirement															

After ActionAid, 1992: 56.

Source: Mikkelsen (1995).

Figure 12 ▶ Example of a participatory rating matrix comparing crops

If there are high levels of disagreement, it may be more valuable but more time consuming to collect ratings from individuals. This can be advantageous because individuals can be categorized according to their livelihood strategy, wealth ranking or other salient factors that may drive differences in perspectives. To efficiently collect information from individuals, it may be useful to draw or print scales for each criterion that can be laminated and used by enumerators who do the interviews. Illustrations can help to clarify the meaning of the scale (for example, if assessing the harvest there could be a small sack at 1 and a pile of full sacks at 5). Ask participants to place a marker on the line to show how they rate the technology in respect of that criterion. To compare technologies, use different colored markers for each one, or make a drawing of each technology on a piece of sticky paper.

The final step is a community plenary session to bring results together and discuss their meaning. Whichever process is used for the rating exercise, both quantitative data (scores in the matrix) and qualitative data (participants' explanations of why those technologies deserve those scores) need to be recorded and analyzed to guide decision-making. Collating information in a simple table (Table 8) provides a helpful overview of the results to be used for discussion across groups in a plenary session, which offers a unique opportunity to understand each other's perspectives that can lead to more nuanced decision-making. Using the fictitious values in Table 8, one could imagine a scenario where women are more responsible for storage and cooking, and men are surprised to learn of challenges to higher yielding varieties 2 and 3. This understanding could lead to the use of some varieties for marketing and others for home consumption.

Box 9 ▶ Facilitation of participatory rating

Exercise	Participatory rating
Time	Approximately 1.5 hours for the group exercise depending on the number of technologies being rated and the process used to determine the criteria. Individual surveys of 40 participants could take several days of field work.
Objective	To learn how different groups (women and men, young and old) evaluate the performance of specific agricultural practices or crop varieties that they are familiar with
Materials	Enough markers (e.g. beans, stones) to have 10 for each box in the matrix (multiply the number of options and by the number of criteria) For option 2 (see below): printed surveys to be filled out when asking community members how they rate each option for all criteria
Preparation	Develop the criteria for evaluating each option through group interviews with each gender and age group. Ask participants to identify factors that affect their opinions about the options being compared, such as the most important traits of a set of agricultural technologies. Consider including other criteria important to the project. Finalize a list of 3 to 6 criteria for use in the rating exercise.
Facilitation	**Option 1:** Group exercise: Invite participants by group (adult women, young women, adult men and young men) to rate each technology for all the chosen criteria. To facilitate this, create a matrix on the ground or on a large sheet of paper using the template below. Give participants a pile of markers (e.g. beans, stones) and ask them to put some in each square to evaluate the options according to whatever scale seems most appropriate (e.g. 1 to 5, or 1 to 10). Template for creating a participatory rating matrix. Using symbols or objects to represent each option and criterion can help respondents with low literacy levels.

	Option 1	Option 2	Option 3
Criterion 1			
Criterion 2			
Criterion 3			
Criterion 4			

Option 2: Individual interviews: Interview at least 10 community members from each age and gender group who are familiar enough with the options to compare them. Use the same process as group 1 but with individuals. During the interview fill out a paper version of the template above with the number of markers placed in each box and then enter that data into a spreadsheet using the set-up suggested here:

Suggested spreadsheet set-up for entering participatory rating data collected from individuals.

Respondent	Variety	Yield	Storage	Cooking	Taste
Name A	1				
Name A	2				
Name A	3				
Name B	1				
Name B	2				
Name B	3				

Organize a community plenary session to bring results together and discuss their meaning. Record and analyze both quantitative data (scores in the matrix) and qualitative data (participants' explanations of why those technologies deserve those scores) to guide decision-making. Collating information in a simple table (Table 8) provides a helpful overview of the results.

Table 8 ▶ Example summary of participatory rating scores

	Variety 1		Variety 2		Variety 3	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
Yield	3	4	4	5	5	4
Storage	3	5	4	2	2	2
Cooking	–	4	–	2	–	3
Taste	3	4	5	4	4	2

This was prepared for three crop varieties by gender, across four criteria (1 for the worst, 5 for the best).

If data is collected from individuals, then they will take several hours to enter and analyze. Entering the data as organized in Box 10 can make it easier to tabulate and compare in a spreadsheet. Most scores are arbitrary (e.g. 1 = poor, 2 = acceptable, 3 = good, 4 = excellent). The best way to compare such scores across groups is to plot a histogram using the frequency of each score, to see which scores are most common and how spread out the scores are.

⟴ Considerations for implementation

It can be confusing that many of the descriptions of this tool in PLA manuals are called 'matrix ranking' because ranking and rating are different processes. In reality, while the tool is often called 'ranking', it is typically described with several implementation strategies including pairwise ranking, ranking and rating. The differences between rating and ranking data are described here, and why rating appears preferable in the context of SAI.

Ratings (giving scores from a set scale, such as 1 to 10) provide more information than ranking (putting the options in order based on the rating scores for each criterion). For example, if option A has a score of 10, option B has a score of 8, and option C has a score of 2, this provides more detailed information than a ranking that only states that A is better than B, and B is better than C – but not how much better. The scoring system can be even more informative if the spectrum is linked to a specific physical meaning. For example, if rating varieties by yield, a score of 10 can mean 'the best yield I have witnessed' and a zero can mean 'no harvest at all'.

However, it should be noted that rating requires more effort from participants than ranking. If there is a large number of options to compare, ranking may be a better choice, especially if relative positioning is sufficient to guide decisions. For example, in 'wealth ranking', all households in the community are ranked by sorting cards into piles by wealth category, which is a much easier task than giving a score to every household. Pairwise ranking can be useful for comparing a large number of options, and is compatible with a high number of criteria if the data is collected systematically. In the context of SAI interventions, there is often a need to compare only two to five options across five or so criteria, in which case rating is manageable and provides more detailed information than ranking. If rating data is linked to a specific physical measurement such as a yield score being linked to sacks per acre, statistical analysis such as calculating means or comparison across communities, is more straightforward (Coe 2002).

Finally, a variation of participatory rating that many find helpful is to distribute a set amount of markers (seeds/stones) across categories. For example, one can take 10 seeds to represent the entire amount of sickness in a community that year, and then the group can distribute the seeds by the type of disease to represent prevalence (Jayakaran 2002). Similarly, co-benefit analysis (Box 10) uses 100 seeds in a group exercise with separate groups of men and women to understand the perceived benefits and burdens from various agricultural practices. It also includes a list of helpful questions to probe deeper into the performance of each technology (Jost et al. 2014).

Box 10 ▶ The co-benefit analysis process

Exercise	Co-benefits analysis
Time	Approximately 2.5 hours
Objectives	To understand how different age and gender groups perceive the benefits and burdens from an agricultural technology or change in agricultural practice
Materials	Poster paper and 100 counters (e.g. beans, stones)
Preparation	Form groups of people disaggregated by age and gender (adult men, young men, adult women, young women) who have experience using the technology you want to learn about. Identify a venue, facilitator and note-taker for each group.
Facilitation	1. In each group, begin the discussion by introducing the technology or change. Ask participants to brainstorm the benefits of the technology and the burdens involved in using it. 2. Once lists of benefits and burdens have been noted, ask a volunteer to list or draw them on a piece of paper or a large poster. Combine similar ideas or prioritize the list using multi-voting. 3. Take 100 counters and explain that they represent all that the participants like about the technology. Ask the group to distribute the counters to show the benefits of the agricultural practice based on the level of benefits and their importance (i.e. the best benefits get the most counters). Encourage the group to work together to create a distribution upon which they agree. Record the information. 4. Next, explain that the counters now represent all the challenges involved in using the new technology. Ask the group to distribute the counters to show the relative burdens of adopting the practice (i.e. the worst burdens get the most counters). 5. Discuss the results as a group to gain more insight into the benefits and burdens of the change. Do those with more experience with the technology agree with each other? Why or why not? 6. Bring the disaggregated groups back together and have them compare and discuss the results from each group, especially noticing differences between men and women, and adults and youth. **Probing questions (use only those relevant to the technology of interest):** 1. How does this activity affect soil quality? Crop diversity? 2. How does this activity affect forest resources? Water sources? 3. How time-consuming is this activity? How does it affect the amount of labor for adult men, adult women, young men and young women? Who does most of the work? Is it done in a group? 4. Are there seasonal or time constraints associated with the technology? 5. How does this activity relate to land tenure? 6. Can all groups or individuals in the village afford the technology? If not, who cannot afford it? 7. Is there special knowledge required to adopt and use this activity? Who has this knowledge? Who does not? How is this information shared? 8. How does this activity affect household food security or consumption? 9. Does this activity have any nutritional benefits? Who makes the decision to invest in nutrition? Who in the household does it benefit the most in terms of nutrition? 10. How does this activity affect overall household income? Who keeps the income? Is it shared? 11. Are there small businesses that have grown from adopting this activity? Do men, women or youth run these businesses?

Source: Adapted from Jost et al. (2014).

Gender and youth-sensitive value chain analysis

⇥ Introduction

Value chain analysis (VCA) is a process of mapping the actors involved in producing a commodity and quantifying the value addition at each stage (Mutua et al. 2014). VCA has been widely used to learn how to improve coordination across networks of actors involved in commercial agriculture, from inputs to final processing. By documenting the roles and challenges at each stage, it is possible to identify bottlenecks that limit the amount of a commodity produced. The goal is typically to find win-win situations and facilitate coordination vertically (across stages in the value chain) or horizontally (such as through collective action by actors in the same stage). By documenting how value is added at each stage, it is also possible to analyze the equity of the commercial arrangements and advocate for policies that support equitable distribution of benefits to all actors.

Most VCA is blind to gender and age issues and focuses instead on identifying limiting inputs, ensuring fair prices paid to farmers, and overcoming inefficiencies such as monopolies on transportation or lack of information about prices. Gender and youth-sensitive VCA asks who is involved, directly or indirectly, at each stage of the value chain, and how gender and age groups can equitably benefit from value addition (Mayoux and Grania 2008). The information from this can be used to measure indicators of equity related to market participation by calculating the incidence of men and women, or adults and young people, participating at each stage of any given value chain. Empowerment does not require equal numbers at each stage, but rather, an equal ability to choose. Thus, the observed inequality raises the question of whether underrepresented groups actually have the ability to participate at that stage. Gender and youth-sensitive VCA can then be used as a key step in the process of overcoming entry barriers.

There are many ways to implement a VCA, some of which can be very time consuming and data intensive. However, most of the gender-focused VCA guidelines are for a collection of participatory exercises whose timeframes and resource requirement better match what is available to SAI decision-makers. Using group interviews with farmers and key informant interviews with stakeholders along the value chain, a well-rounded understanding can be obtained in a relatively short time. A larger project may include household surveys to quantify labor contributions, production and prices. Direct observations of gender roles in each market setting would also help to verify the information.

⇥ Facilitation

Here, information is synthesized from various sources and adapted for a rapid gender- and youth-sensitive VCA. The 'Gender in value chains toolkit' (Senders et al. 2012) includes instructions for mapping exercises, examples of questions for focus groups to analyze the role of women, and detailed approaches for women's empowerment in value chains. A key contribution is the emphasis on how to make women contributions more visible, even in value chains dominated by men. Instructions on value chain mapping based on experience of the GALS program in Zimbabwe are presented by Reemer and Makanza (2014), where before mapping the value chain, gender groups created market maps. After implementing the VCA, discussion is focused on ways to improve marketing to obtain better prices or to reduce transaction costs. Questions from the 'Rapid assessment tool for gender in crop value chains' are adapted and combined (Mutua et al. 2014, Appendix 2), also incorporating questions and insights from the experience of the first author in carrying out a gender-sensitive VCA with World Renew in Lundazi, Zambia.

Phase 1 ▶ Preparation

Mapping out how various actors are connected in the value chain is a central component of any VCA. During the planning stage, it is worth taking the time to develop a visual representation of the value chain (an actor map). It should be as detailed as possible to guide where there is need to collect what types of data. This actor map can then be updated as information is collected.

After creating a draft actor map, the first step in gender and youth-sensitive VCA is to formulate hypotheses or informed guesses about the roles of women and youth, and possible entry points for their greater participation in the value chain. This can be done from existing knowledge or could require fieldwork to observe and ask questions about the actual roles of women and men, adults and youth, at each stage of the value chain.

The next step is planning the data collection process. Below, activities are presented that collect information about various aspects of the value chain, but that does not mean all activities are necessary. The hypotheses should drive the planning process, to focus data collection on the parts of the value chain where change can have the greatest impacts on equity. This is often an iterative process of developing new hypotheses as new information is obtained.

For example, in the Zambia experience, the aim of the VCA was to understand why farmers were not planting more soya even though the distant processing plants needed more supply each year. Community members explained their disappointment with soya production in terms of the extremely low prices at harvest time. Women explained how they were often pressured to pay back loans at harvest time, meaning that they could not wait for prices to go up later in the season. Farmers attributed the dramatic seasonal fluctuations in the price for soya to exploitation by traders. However, traders explained that the processing plant has limited storage and so buys at low prices just after harvest to slow the inflow, and that they then raise the price as time goes on to encourage more sales. These interviews with farmers and traders point to the need to gather more information about credit services and grain storage to determine whether interventions in those aspects of the value chain could improve women's equity.

Phase 2 Data collection

If the goal is to improve equity for smallholder farmers, it makes sense to start data collection by talking with farmers across gender and age groupings. Various participatory tools can be used to understand gender aspects of production, such as using the seasonal calendar or the participatory drudgery score. If a new technology has been introduced, it may be important to explore how it impacts each gender and age category. Mutua et al. (2014) provide a long list of questions for a general inquiry into gendered aspects of both crop and livestock value chains.

The bicycle wheel market exercise

A key piece of information for gender and youth-sensitive VCA is to document where farmers sell their products. The following bicycle wheel exercise is adapted from World Renew (C. Fabiano, personal communication).

1. Invite participants who grow the product of interest to an exercise and divide them into age and gender groups. Explain that a "market" is defined as a place or activity where products are bought and sold. Sometimes, products are bought and then resold to someone else.

2. Ask participants to draw a circle in the middle of a large sheet of paper. In the middle of the circle, draw a picture of the product you are focusing on for this activity as the center of the bicycle wheel.

3. Ask participants to identify all the places where they sell this product. Show these as spokes on the wheel, where each spoke is a different "market" (a place/activity where products are bought and sold). Some of these may be in the village and other farther away (the distance can be written on the spoke if desired). This may include "intermediaries" etc. In some cases, the exchange may be through trading products (bartering), rather than using money.

4. Have each group present a summary of their diagram. Next, facilitate a discussion about how marketing differs across age and gender categories.

Key informant interviews with business actors

Moving downstream (towards the final product), an important perspective for a VCA is that of the business people who buy from the farmers. Key informant interviews can be an efficient way to interact with traders and processors, starting with those who were identified by farmers through the bicycle wheel exercise. Below is a list of questions that may be useful during such interviews:

- Where do they buy the product of interest? How much do they buy and at what price?

- What are the relative proportions of men and women selling to them?

- What challenges do they face in running their business and what are possible solutions?

- What challenges do they think farmers face and how could these be resolved?

SAI technologies may require the purchase of inputs such as fertilizer, seeds, new tools etc. In such cases, gender- and youth-sensitive VCA can be applied by going upstream (away from the final product), and interviewing input dealers and manufacturers. Adapting the question above, key informant interviews can be used to understand where they sell their inputs, who buys them and what challenges their businesses face.

Quantifying value addition and equity

In some cases, it may be important to obtain detailed financial information to calculate which groups benefit most from the value chain. This requires asking questions about prices and expenses at each stage, so that the added value from processing can be analyzed. The price information can then be multiplied by the disaggregated numbers of actors (by gender and age group) at each stage, to calculate the total value for each of the groups. This provides key information for designing programs that aim to increase equity.

Phase 3 ▸ Processing and summarizing

As the data is collected, the initial value chain map should be updated with as many details as are relevant for the purpose of the VCA. These findings are then be presented to the communities and discussed with stakeholders from across the value chain. A one-day stakeholder meeting is a useful way to obtain feedback on the data collected and to foster dialogue about the ways forward. The following activities could be carried out during such a meeting.

Actor mapping

Make a visual presentation of the value chain showing the stages and actors operating at each stage. The stages typically include input supply, production, primary processing (between harvest and the basic sellable form), secondary processing (modifying a commodity into a specific product), wholesale and retail. Transportation may be considered as part of these stages or can be inserted between any of the stages. Note that there may be parallel streams for a value chain (e.g. informal sector versus industrial sector for milk production). Often there are also branches to the chain, as different actors may use a single agricultural product in different ways (e.g. cassava for industrial starch and for food products).

 It is also important to identify the actors that support each stage of the value chain. These could be service providers, government agencies, community leaders etc. They play an important role in the change process, because some may have unique leverage to increase equity in the value chain.

Activity mapping

For each stage in the actor map, list the major activities that are performed. Next, document the roles for each gender and age group along the value chain. This may be achieved with the activity profile tool (Section 4). Next, estimate the percentage of actors in each group (men, women and youth) at each stage, or the percentage of effort expended by each group for an activity. Collect more data as needed, using the time allocation tools, for instance.

Reflect on the activity mapping by discussing the following questions:

- Where are most people concentrated? Where are the women, men and the young people?

- Where is the value/power concentrated?

- Who are the most vulnerable stakeholders?

Make invisible stakeholders visible

This is a critical step for gender and youth-sensitive VCA. Think through the roles women and youth play in each step, even if indirectly, and add them to the map. For example, even if men are responsible for spraying chemicals on the crop, do women bring the water? If men are responsible for mango nurseries, do children bring the mango stones or seedlings for planting? Determining the boundaries of the analysis will depend on the objectives and plans to make use of the information.

Final discussion and reflection questions

- What are the priority blockages and leverage points for action to increase incomes for vulnerable stakeholders in the short and longer term?

- Where are women excluded? Which men are also vulnerable? Where are young people excluded or vulnerable? What is currently known about the reasons for inequalities/exclusion?

- Who are the most powerful and important value chain supporters? Could any of these be allies from the start? How gender sensitive are they? What gender capacity building might be needed? By whom and how?

- To what extent can the skills and assets of young people contribute to the value chain?

## Box 11 ▶ Facilitation of the bicycle wheel market exercise

Exercise	Bicycle wheel market exercise
Time	1.5 hours
Objectives	To obtain local information about where farmers sell their products
Preparation	Determine clear objective(s) for the exercise
Materials	Large sheet of paper and marker pens
Facilitation	**Implementation:** 1. Invite participants who grow the product of interest to an exercise and divide them into age and gender groups. 2. Explain the objectives and the process. 3. Explain that a "market" is defined as a place or activity where products are bought and sold. Sometimes, products are bought and then resold to someone else. 4. Ask participants to draw a circle in the middle of a large sheet of paper. In the middle of the circle, draw a picture of the product you are focusing on for this activity as the center of the bicycle wheel. Ask participants to identify all the places where they sell this product. Show these as spokes on the wheel, where each spoke is a different "market" (a place/activity where products are bought and sold). Some of these may be in the village and other farther away (the distance can be written on the spoke if desired). This may include "intermediaries" etc. In some cases, the exchange may be through trading products (bartering), rather than using money. 5. Have each group present a summary of their diagram in plenary (whole group). 6. Facilitate a discussion about how marketing differs across age and gender categories.

Write a summary report of the qualitative and quantitative findings and draw a summary map of the results. Examples of tables and maps of gendered VCA can be found in Rubin et al. (2010). Figures 13 and 14 show two maps of gendered VCA from documented exercises in Ethiopia and Malawi.
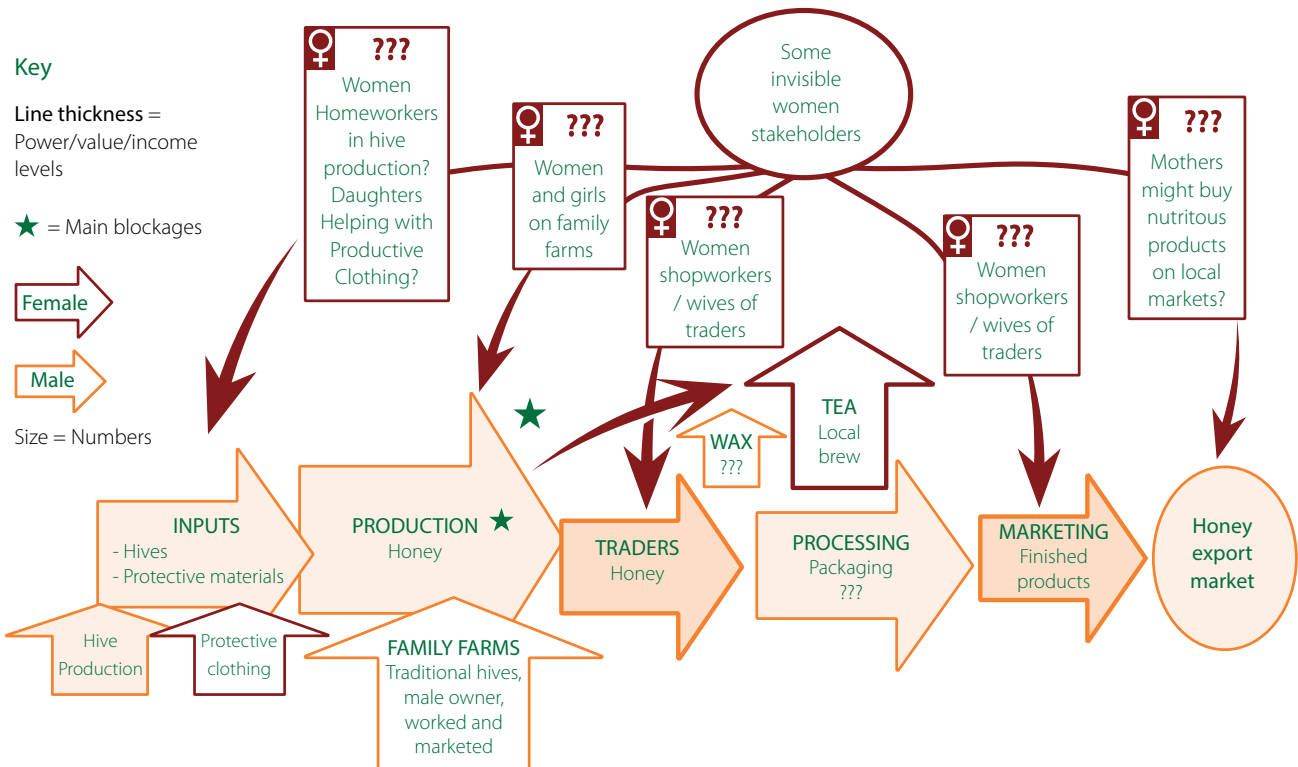
Source: Senders et al. (2012).

Figure 13 ▷ Invisible women in a honey value chain in Ethiopia
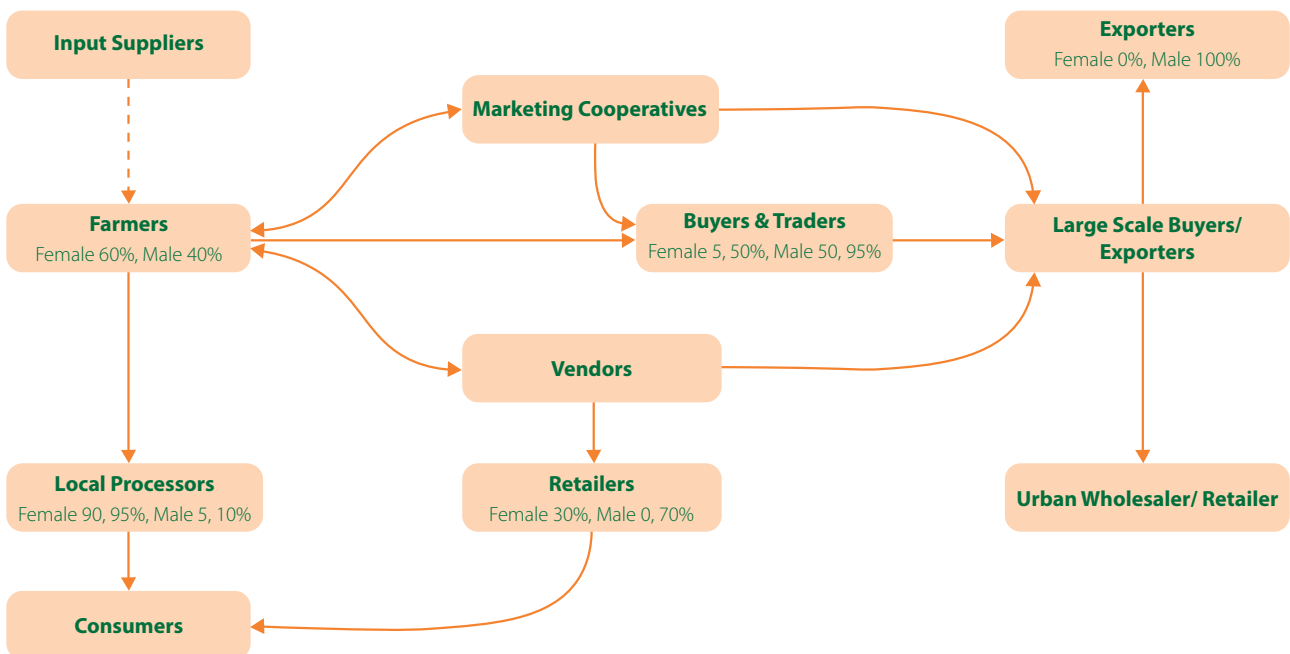
Source: Me-Nsope and Larkins (2016).

Figure 14 ▷ Gendered participation along a pigeon pea value chain in Malawi

⊕ Considerations for implementation

Mutua et al. (2014) assert that value chains need to be analyzed from a gender perspective, not only to effectively inform the design of the intervention, but also for monitoring and evaluation. They also emphasize the importance of facilitators having a sound understanding of gender issues and analysis at various levels. Coles and Mitchell (2011) emphasize the need for robust analysis to ensure that poor data does not lead to inappropriate interventions, which can make women worse off. Making Cents International (2014) provides a brief outline of how to carry out value chain analyses for youth empowerment. A critical issue is value chain selection, and to what extent the skills and assets of young people can contribute to the value chain.

Leaky bucket tool

⊕ Introduction

The leaky bucket tool is an exercise designed to explore economic dynamics at household or community level with people who may have low economic literacy (Cunningham 2011). By having separate groups based on age and gender, this tool can provide detailed information about production, prices and costs, as well as the perspectives of each group on the local economy.

The group exercise is centered on a drawing of a leaky bucket, where there are inflows related to income, and outflows related to expenses (Figure 15). At the household level, it can be used as a budgeting tool for making wise choices about how money is generated and used. Reducing expenses is like plugging holes, which causes more water to be in the bucket, representing more cash available. Peters et al. (2012) used it in Ethiopia and found that it encouraged gardening to replace purchased vegetables, and compost production to reduce the purchase of fertilizers. At community level, discussions may encourage local purchases, value addition and reducing wasteful expenses on goods.

⊕ Facilitation

This exercise has been used in groups to investigate how to improve the profitability of agricultural products by documenting inputs and expenses from an average plot (Ratner and Wyckoff 2015). This can be especially useful for working towards equitable SAI where projects often try to improve a specific crop or value chain. The instructions for a product-specific leaky bucket presented below are adapted from Ratner and Wyckoff (2015). Separate groups of men and women, youth and adults will allow for a helpful comparison of experiences and perspectives.

Box 12 ▶ Facilitation of a product-specific leaky bucket exercise

Exercise	Product-specific leaky bucket
Time	Approximately 2 hours
Objectives	To explore the economic dynamics for an agricultural product and obtain gender- and age-disaggregated information about production, prices and costs
Preparation	The facilitator should choose which agricultural product to focus on and what scale to use. For field crops, it could be a hectare, for animals it could be the average number per household
Materials	Flip-chart paper and marker pens
Facilitation	**Part 1: Group work**

Part 1: Group work

1. Set-up:

   a. As a group, estimate the average production for the product of interest at the relevant scale (e.g. the number of 50 kg sacks expected from one hectare of soya).

   b. Draw a bucket of the selected crop or activity on a large piece of paper.

2. Farming expenses as drawn arrows leaking out:

   a. Ask participants to brainstorm all of the inputs needed to produce the item, from before planting up to selling the product, including expenses for labor, transportation, packaging etc. Record them as arrows leaking out of the bottom.

   b. After they have listed all the inputs, have participants estimate the cost of each input, using the amount appropriate for the scale you have chosen (e.g. 1 hectare). Note that it is quite difficult to assign a value for household labor. The best approach is to consider the opportunity cost of doing that work: how much could they have earned doing something else with their time? Often calculations are done without including labor costs, and then when the cash expenses are subtracted, the remaining income can be divided by labor days to show how much money the household earns from the activity (returns to labor).

3. Product sales as arrows going in:

   a. Ask participants to brainstorm and record all of the money from sales of the product, as arrows going into the bucket.

   b. Often a crop or type of livestock may have several products sold (such as the grain and the residues for feed).

   c. Participants can also separate different types of markets if they sell a portion to each (e.g. 50% sold at the local market immediately after harvest and 50% stored and transported to a distant market).

   d. Also include any product that is used by the household (as this represents avoided costs) or given away as gifts.

   e. Ask for approximate percentages of the community's harvest that go to each market or use (which can be done by having them distribute 20 counters, each representing 5% of the harvest). This can help to understand what price is obtained for most of the crop as well as preferences about where to sell.

   f. Record the average price at each market and the estimated value of each use, so that revenue from each source can be calculated.

   g. Determine the net profit by subtracting the total cost of production per hectare from the total revenue per hectare.

   h. Go back over the diagram and ask whether it is women or men who pay each cost, and whether it is women or men who make decisions concerning the use of each source of revenue.

i. Facilitate the following discussion questions in each group:

    i. Are they making money from this crop, animal or activity?

    ii. Where are the opportunities for decreasing expenses and increasing revenue?

    iii. What should be the price of the product to allow a profit to be made?

    iv. Is there surplus production? Or not enough production to meet current needs? Whose needs? Are women's and children's needs being met?

Part 2: Plenary discussion

After each group has completed its diagram and discussed the results, have the groups come together and share a brief summary of their diagrams and the key points from their discussions. In a plenary, use the following questions to facilitate discussion:

1. How are the leaky buckets from each group different? What does that say about gender and age differences for this product?

2. What role does gender and age play in decision-making about expenditures and marketing? What role does gender and age play in production?

3. What changes could be made to improve profits? What changes could be made to share any profits more equitably?

4. What additional information is needed? Who else could help to provide that information?
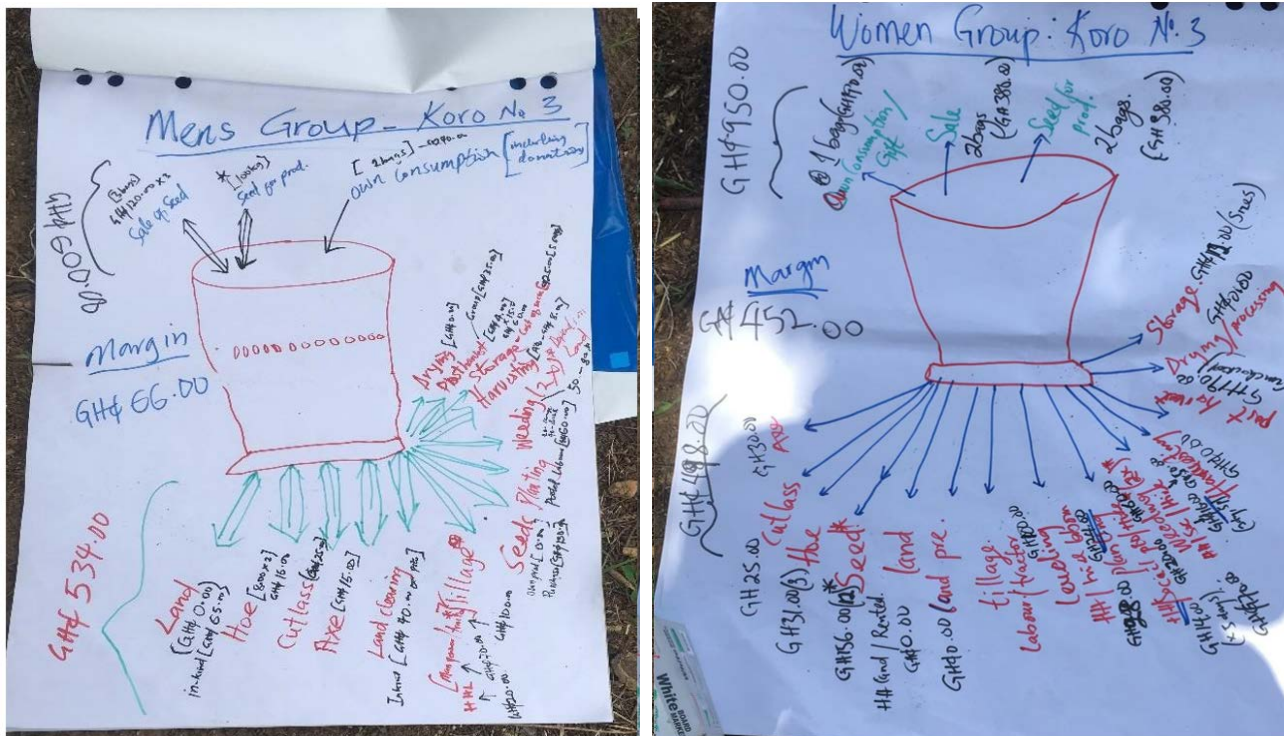
Diagrams on groundnut production (men's group left and women's group right), Upper West, Ghana, February 2019.
Photo Credit: Joseph Bandanaa and Bernard Guri.

Figure 15 ▶ Examples of leaky bucket diagrams

NGOs in Ghana found that using the leaky bucket tool with groups of women and men was a helpful way of discerning differences in production costs and marketing strategies. They found that women have more profitable groundnut production in Upper West region because men sell at a low price after harvest for immediate cash needs, and spend more on inputs (e.g. providing pito, a sorghum drink for workers, and purchasing seed from the market). This led to the suggestion that perhaps women should be allocated more land for groundnut. However, it was also noted that there could be some missing information on costs and inaccuracies regarding prices, so the exercise should be repeated and the information checked using other tools before taking action.

⮡ Considerations for implementation

In some cases, a product-specific leaky bucket may not be warranted, but rather a broader analysis of the local economy. In that case, a community-level exercise with representatives from households, businesses and local government would be more useful. These instructions for a community-level leaky bucket exercise are adapted from Cunningham (2011). The facilitator starts by explaining that participants should try to imagine their community economy as a bucket, with income sources from outside the community pouring in from the top, and expenditure on goods and services purchased outside the community spilling out of the holes in the bottom.

The steps for drawing the leaky bucket tool are as follows:

1. The facilitator draws a picture of a bucket with three boxes inside representing households, businesses and government as the primary actors in the economy.

2. The facilitator then asks participants about income originating from sources outside the community and draws each one as an incoming arrow from the top of the bucket to the appropriate box.

3. Next, the facilitator asks about interactions between businesses, households and the government within the community and draws those arrows in the bucket between the boxes.

4. Finally, the facilitator asks about expenditures by households, businesses and local government that are happening outside the community. These are added as arrows leaking out of the bucket.

Note that not all expenditures are wasteful. Expenditure on education or productive equipment is an investment in future earnings. The goal is not to plug the holes, but to consider ways to raise the water level (increase the size of the local economy), such as by reducing unnecessary expenditure, generating new streams of income or increasing the cycling of money within the community.

5 | Tools for decision-making
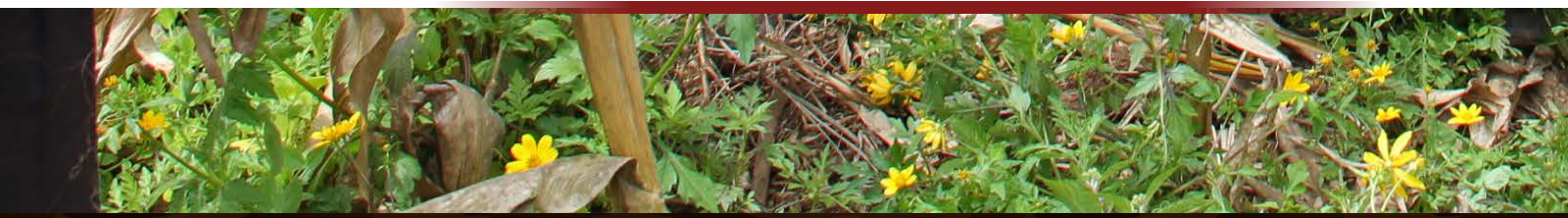
This section focuses on tools for decision-making processes after data on youth and gender equity has been collected. The decision-making tools below are primarily for project teams to use, though many could be adapted for use with communities or other larger collaborative stakeholder groups. Some tools are adapted from Hedreen (2019), which includes information on applying them in business contexts.

As mentioned in Section 2, including community members and other stakeholders in the decision-making process is critically important for effectively addressing complex problems such as inclusive and equitable SAI. The exact nature of stakeholder participation will depend on the specific context. In some situations, project managers may decide to facilitate community level decision-making, guided by certain parameters. In other situations, project managers may decide that consulting community members and then taking a decision as a project team would be more appropriate.

The tools are presented from the simplest to the most complex, including a description of what the tool is useful for, and the specific steps for implementation, including tables or illustrations with relevant examples relevant to equitable SAI. The last paragraph for each tool links them to equitable SAI, including connections with data collection tools from Section 4. Table 9 provides an overview of each tool and how it can be applied.

Table 9 ▶ Overview of decision-making tools

Decision-making tool	Overview and application
Bridge building	Broad planning of actions that can serve as a bridge between the current reality and the desired future. Often used in groups but can be done individually.
T-chart	Systematic listing of pros and cons of a choice between two options, considering gender and age perspectives.
Multi-voting	Prioritizing possible activities when there are many options. Especially useful for large teams.
SWOT (strengths, weaknesses, opportunities and threats) analysis	Deciding on a strategic direction based on internal and external factors. Can be applied to how a specific agricultural change contributes towards sustainable agricultural intensification (SAI).
Decision matrix	Numeric scoring of attributes across options, considering equity. Useful for comparing 2 to 5 options across 3 to 5 criteria.
Cost–benefit analysis	Analyzing the financial impact of 2 to 5 options, including how the costs and benefits are distributed across gender and age groups.
Scenario planning	In-depth exercise for envisioning future scenarios and planning for those possibilities strategically. Applicable for broadly setting a direction in contexts of high uncertainty.

Bridge building

This is a tool for developing an action plan for a better future and encouraging equitable decision-making. It can be used with various stakeholder groups to understand their priorities and criteria for a successful intervention. The bridge building tool is a relatively simple visual representation (Figure 16) of current reality and desired future, with possible changes as the bridge between the two (Vandenberg 2012). It is similar to the vision journey exercise from the GALS program (see Gender and Youth Balance Tree, above), but the focus here is a group exercise to identify shared priorities. Results from data collection can help to identify who should participate. Previous information about communication across gender and age groups serves as a guide to dividing participants to ensure all perspectives are effectively heard.

Box 13 ▶ Facilitation of the bridge building tool

Exercise	Bridge building tool
Time	1–4 hours depending on the number of participants and the level of detail desired in the action planning
Application	1. Broad planning of actions that can serve as a bridge between the current reality and the desired future. Often used in groups but can be done individually. 2. Obtaining rich, detailed descriptions across stakeholders of the desired future from sustainable agricultural intensification (SAI) to facilitate collaborative action.
Materials	Flip chart paper and marker pens
Facilitation	1. Ask participants to describe their desired future in as much detail as possible. This can be achieved through small group work (4 to 8 participants) that produces drawings or descriptive statements, which are placed on the right side of a flip chart. 2. Have participants describe the current reality of the situation in a similar fashion, placing the drawing or statements on the left side of the flip chart. The results of any analysis from data collection tools can be used to detail the existing reality of all gender and age groups related to SAI. 3. Participants should then brainstorm ideas that can help change the situation from its current state to the desired state. These are written in the middle to form a bridge between the two sides of the flip chart. Differing visions about sustainability or equity may lead to disagreement on what actions should be taken. Discussing those differences and understanding each other's perspectives is an important component of working collaboratively. 4. If small groups are used, each group should present to the plenary and a combined bridge diagram (or set of diagrams) can be created before the next step. 5. The actions that effectively link the current state to the desired future can then be developed into action plans. The specific steps to make that action possible should be listed along with who is responsible for guiding each step, what support they need, and when it can reasonably be accomplished. Questions about how to best achieve that desired future may prompt the group to use other decision-making tools and/or to decide to collect more data with one or more of the data collection tools from the previous section.

Bridge building is an excellent tool for obtaining rich, detailed descriptions of the desired future from SAI. However, the word 'sustainable' has a wide range of meanings, so an important step is to discuss how various groups conceptualize sustainability and how the project or intervention can operationalize the word. This can help to avoid misunderstandings, as well as revealing common interests, both of which are key to a collaborative movement. Bridge building provides a good basis to deciding how to work towards equitable SAI. The tools below complement the process by providing more detailed analyses of specific changes.

T-chart

This classic tool can trace its roots back to Benjamin Franklin's recommendation of listing the pros and cons to guide a friend's decision (Popova 2018). Brainstorming ensures that all the positives and negatives are taken into consideration when making a decision. These are organized graphically on paper and can be used to assess the advantages and disadvantages of a choice. If desired, each of the items can be weighted for a quantitative comparison (see Decision matrix, below).

Box 14 ▶ Facilitation of the T-chart tool

Exercise	T-chart tool
Time	0.5 to 1 hour depending on the number of participants and the amount of discussion
Application	Systematic listing of pros and cons of a choice between two options, considering gender and age perspectives
Materials	Flip-chart paper and marker pens
Facilitation	T-charts often involve the following steps (Business Analyst Learnings 2016): 1. A large 'T' is drawn on a flip chart, labeled with the option that is to be considered in greater depth. 2. Make two columns for the 'pros' and the 'cons' (see example below). Sometimes there may be corresponding pros and cons, for example, a cheaper product (pro) may not last very long (con). 3. For an equitable decision, the T-chart needs to consider the pros and cons for adults and youth, for men and women. There may be multiple concerns related to equity for a set of options that need to be compared. For example, one technology might improve equity for young men, but neither help nor harm women, while another might best improve equity for adult women, but neither help nor harm young men. 4. Once the pros and cons of each option have been listed, they can be compared. Depending on the weight (importance) of each pro and con for each option, the balance will usually tip one way and a decision can be reached. In some cases, the T-chart may help target technologies at specific groups to create greater equity for them.

Example of a T-chart to decide on farmer group meeting times. Choice: Should the farmer group meetings be scheduled in the morning?

Pros	Cons
Work on the group field can be done after the meeting.	The meeting may conflict with events at the health center.
Everyone will be more alert than in the afternoon.	Women will be less likely to attend due to other responsibilities at that time.
…	Most farmers prefer to work in their own fields in the morning.
…	Young people attending school will not be available.

Box 14 includes an example of how to use a T-chart with regard to inclusive SAI. The issue that is being considered is whether farmer group meetings should be scheduled in the morning. One question that arises is how the decision will affect women and youth. Data from the daily time use tool in this guide could help inform this particular decision. Once the pros and cons have been listed and evaluated, a decision can be made. In this case, it appears that the cons outnumber and outweigh the pros.

Multi-voting

Often, it is possible to make long lists of possible actions, but then left wondering what to prioritize. Multi-voting is useful for reducing a long list of options to a smaller list of priorities, which can then be analyzed further. It is particularly useful when a relatively large project team (10 or more people) are involved in making a decision together and need a process for prioritization.

Box 15 ▶ Facilitation of the multi-voting process

Exercise	Multi-voting process
Time	Approximately 1 hour depending on the number of participants and the amount of discussion
Application	Prioritizing possible activities when there are many options. Especially useful for large teams
Materials	Flip chart paper and marker pens, enough counters for each participant to cast their votes (3 to 5 per participant)
Facilitation	Multi-voting is often implemented in the following way (ASQ 2005): 1. List and display all of the options available, for instance on a flip chart. Similar options may be grouped together as one option. 2. Every participant is allocated a certain number of 'votes', typically three to five, depending on the number of options on the list. It is important that all participants have sufficient information about each option to be able to make a relatively informed choice. 3. Each casts his or her votes by placing a set number of check marks, sticker dots, stones or beans next to the preferred options. Alternatively, the options can be numbered, and participants can vote by writing the numbers of their chosen options on folded pieces of paper, which provides anonymity. 4. The votes are tallied for each option and the options with the most votes are declared to be the top priorities. 5. This should be followed by action-planning for the priority items

Thete, Malawi, April 2009. Photo credit: P. Grabowski/World Renew.

Figure 17 ▶ Multi-voting on community dreams

Multi-voting can be used in a community to prioritize aspects of SAI (Figure 17 and Table 10). In Malawi, World Renew used a technique called 'appreciative inquiry' to encourage communities to agree their dreams to improving livelihoods. Each option was held up by a community member advocating for that option. The participating voters walked down the line and considered each option. When they came across one that they agreed with and wanted to vote for, they placed a bean in the bowl in front. The bowl that had the most beans was declared to be the group's top priority. In the example in Table 10, the community's biggest collective dream was for food security.

Table 10 ▶ Results of multi-voting on community dreams from a community in Salima, Malawi

Dream	Number of votes
Food security	111
Fertilizer	61
Early maturing maize seed	52
Small business loans	34
Maize mill	22
Livestock	16
To be the literacy teacher	13
Irrigation farming (treadle pumps)	9
Water harvesting (constructing a dam)	6

Multi-voting can be used in communities, businesses, organizations and government agencies to prioritize potential SAI interventions. There needs to be proportionate participation of women and youth in the voting process to achieve equitable outcomes. Before voting, each intervention needs to be clearly explained, including potential impacts on women and youth. Each option should be evaluated based on the time requirements, training needs and priorities of each gender and age group, using the data collection tools in Section 4. Participatory rating of technologies may be particularly useful before voting.

Box 16 ▶ Facilitation of the SWOT analysis

Exercise	**SWOT analysis**
Time	Approximately 1 hour depending on the number of participants and the amount of discussion
Application	Deciding on a strategic direction based on internal and external factors. Can be applied to how a specific agricultural change contributes toward SAI
Materials	Flip-chart paper and marker pens

Facilitation	A SWOT (strengths, weaknesses, opportunities and threats) analysis can be implemented as follows:
	
	 1. Identify the group of interest for the SWOT analysis, such as a community, a farmer group or cooperative. Invite men and women, adults and youth involved in that group.
	
	 2. Set up a chart divided into four squares: one for strengths, one for weaknesses, one for opportunities and one for threats (see example below).
	
	 3. **Option 1:** General SWOT analysis for a group. Assess each SWOT area:
	   a. List your strengths. What sets your group apart?
	   b. List your weaknesses. Be honest. What areas is your group falling behind in compared with other groups?
	   c. List your opportunities. What is the direction your group should go and what opportunities are available to help you get there?
	   d. List your threats. What might get in the way of your group achieving its goals?
	
	 4. **Option 2:** Considering SWOT for assessing how particular agricultural change contributes toward equitable SAI.
	   a. List your strengths and how the agricultural change supports or utilizes them
	   b. List your weakness and how the performance of the agricultural change might be impacted by those weakness, especially considering inequities within your group
	   c. What are the main threats that may arise from the agricultural change? Are there different threats for men and women, young and old?
	   d. What opportunities may indirectly come from the agricultural change? How are opportunities different for men and women, young and old?
	
	 5. For both options: Look for connections between quadrants. See how your current strengths relate to upcoming threats, or how eliminating weaknesses could create opportunities
	
	 6. Arrange information in a way that shows the greatest priorities for change.

Example SWOT analysis of how women are affected by legume commercialization.

Internal	
Strengths – direct equity benefits	Weaknesses – direct equity challenges
1. Legumes typically grown by women, so could help them earn more money	1. Less legumes may be consumed, resulting in under-nutrition

External	
Opportunities – indirect possibilities	Threats – indirect risks
1. Processing for value addition	1. Men would be more interested in legume production but if they take over legumes, women may be worse off

SWOT analysis

SWOT analysis is a useful tool for re-evaluating strategic direction. SWOT stands for strengths, weaknesses, opportunities and threats. The strengths and weaknesses are internal to the group (e.g. a community or organization) such as people and processes, while the opportunities and threats are external to the group, such as markets and competition. Listing these items in a group setting creates space to draw on strengths, address weaknesses, maximize opportunities and face threats. It helps groups maximize successes and limit failures (Mind Tools no date).

In the context of inclusive SAI, SWOT can be adapted to compare alternatives based on information collected (see example in Box 16). The strengths and weaknesses would be how the internal factors of a group interact directly with each option. The opportunities and threats would be how factors external to the group interact with each option, typically indirectly affecting equity. Questions could include: What are the main threats that may arise if that option is selected? What opportunities may indirectly come from choosing that option? Identifying these threats and opportunities will depend on the data collected from tools in Section 4. The example in Box 16 could also draw on detailed information from a gender- and youth-sensitive VCA.

Decision matrix

A decision matrix is used to evaluate all options across multiple criteria. Participants (or even individual decision-makers) score each option for each criterion and enter the scores in the matrix. They could be based on a professional opinion, or from detailed data collection, such as the participatory rating tool in Section 4. The aim is to minimize subjective or impulsive selection of options by providing numeric values through a step-by-step process. The tool allows for comparing any number of options by any number of criteria, though a larger matrix takes more effort to complete.

In many cases, some criteria may be more influential and important than others. For that reason, it will often be useful to use weightings to reflect the importance of each. The weightings are then multiplied with the rating of each option to create scores, with the sum total providing a single number for comparison. Nevertheless, the process of assigning weights and scores is rarely a precise measurement. Instead, it should be thought of as an honest attempt to quantify differences in a way that allows for an overall comparison across criteria.

The decision matrix is especially important for SAI because sustainability inherently involves seeking to balance multiple objectives. SAI can be assessed across five domains: productive, economic, environmental, social and human (Musumba et al. 2017). Within each domain, there can be multiple objectives such as grain yield and fodder production in the productivity domain, or gender equity and youth equity in the social domain. Thus, decision-making for equitable SAI will likely require comparing interventions across a long list of criteria. The decision matrix is an excellent tool for simplifying that process. Furthermore, it can be filled out separately utilizing the perspectives of various age and gender groups.

Box 17 ▶ Facilitation of the decision matrix

Exercise	Decision matrix
Time	1 to 2 hours depending on the number of participants and the number of options
Application	Numeric scoring of attributes across options, considering equity – useful for comparing 2 to 5 options across 3 to 5 criteria
Materials	Flip-chart paper and marker pens, enough counters (e.g. stones, beans) to have at least 5 for each box of the matrix (options x criteria)
Facilitation	A decision matrix involves the following steps (adapted from Business News Daily 2019):

1. Create a table with a column for each of the options and a row for each criterion that affects the decision. Brainstorming followed by multi-voting can be used to generate both the options and their criteria. For equitable SAI, it is important to consider impacts across gender and age groups for the decision.

2. Collectively assign a weighting for each criterion representing its importance for the decision. A simple strategy for assigning weighting is to count out four markers (stones, beans, coins) for each. For example, in the table below, there are four criteria, so count out 16 markers that can then be distributed across the criteria based on their importance. In the example, the first two criteria are considered to be more important. Assigning the weights can be done collectively through discussion or individually and then averaged, depending on the purpose and the group dynamics.

3. Rate each option using a scale, such as 1 to 5. Make sure the rating is consistent: a high score should always be the more desirable for each criterion.

4. For each option, create a score by multiplying the rating with the weighting. Adding the scores for all the criteria creates a total score for each option.

5. Use the matrix to reflect on the weaknesses of the best option by noting which criteria have the lowest scores. Is there any way the project can be adjusted to improve those scores? This is especially important for equity-related criteria.

6. If participants are not comfortable with the numeric result because it does not seem to make sense, then consider revising the weighting for each criterion or reflect on the reliability of the scores for each option.

Example decision matrix regarding a new machine for community processing.

Criterion	Weight	Option 1: Maize mill		Option 2: Groundnut press	
		Average rating	Score (rating × weight)	Average rating	Score (rating × weight)
Effect on women's time	6	5	30	4	24
Income for women	5	3	15	5	25
Availability of suitable locations for women's access	3	2	6	3	9
Impact on household budgets	2	1	2	3	6
Total score (higher is better)			56		64

Cost–benefit analysis

This technique is used when weighing the financial ramifications of each possible alternative to come to a final decision that makes the most sense from an economic perspective. In some countries, it is a legal requirement for government ministries to carry out cost–benefit analyses for all government projects. It is particularly useful for projects that have long-term benefits, as it helps to clarify if the short-term costs in achieving those benefits are worthwhile by calculating the net present value. The basic framework is presented here with an example to show how the principles behind cost–benefit analysis can be applied to decision-making for equitable SAI.

It is not recommended to use this as a key decision-making tool for equitable SAI because many of the gender and youth factors are difficult to value in monetary form. Furthermore, it is not easy to integrate the calculations in a participatory framework with an emphasis on gender transformation. Finally, many assumptions can be embedded in the calculations, and this has been abused to justify a predetermined option. Nevertheless, cost–benefit analysis is commonly required by donors or by policies, and this brief overview highlights how it can be adapted to detect the distribution of benefits and costs across gender and age lines.

Box 18 ▶ Facilitation of the cost–benefit analysis

Exercise	Cost–benefit analysis
Time	4 hours to several days depending on the level of detail needed and the complexity of the project
Application	Analyzing the financial impact of 2 to 5 options, including how the costs and benefits are distributed across gender and age groups
Materials	Flip-chart paper and marker pens, information about prices for inputs and outputs
Facilitation	A simple cost–benefit analysis for equitable sustainable agricultural intensification (SAI) can be carried out as follows (adapted from Mind Tools no date): 1. Brainstorm and list all the costs and benefits with regard to a particular decision for each group of interest (adult men, young men, adult women, young women). 2. Give a monetary value to each cost for each group, including resources and human effort. In subsistence settings it is important to include unpaid family labor. Often the typical wage rate for agricultural work is used. 3. Give a monetary value to each benefit for each group. It is important to consult many people on each benefit as some can be subject to differing opinions. 4. Calculate total costs and the total benefits for each group and in total. 5. Compare costs and benefits. It is also important for long-term projects to consider how much time it will take for the benefits to pay back the costs. 6. Consider how benefits and costs compare for each group (men and women, youth and adults). If one group bears the costs and another the benefits, it is not equitable, even if it is profitable. Consider how norms and responsibilities could be changed to share the costs and benefits more evenly. 7. If the benefits outweigh the costs for each group, then a course of action can be decided.

Example cost–benefit analysis of growing sunflower and sesame between men and women.

	Sunflower			Sesame		
	Total	**Men**	**Women**	**Total**	**Men**	**Women**
Seeds	−$10	−$10		−$10	−$10	
Labor	−$100	−$50	−$50	−$100		−$100
Transport	−$25	−$25		−$25	−$25	
Sales	$300	$250	$50	$300	$250	$50
Total	**US$165**	**US$165**	**US$0**	**US$165**	**US$215**	**−US$50**

Box 19 includes a fictitious example of a cost–benefit analysis used to see whether from a gender perspective, it would be better financially to grow sunflower or sesame. In both options, the benefit outweighs the cost by the same amount. However, the gender distribution of costs and benefits shows that the costs are greater for women than for men when growing sesame.

A key domain of sustainable intensification is economics. To achieve environmental goals from sustainable agriculture, farmers need financially viable technologies and consumers need financially sound food systems. Thus, cost–benefit analysis is a key tool for evaluating SAI interventions. Furthermore, sustainability often requires short-term expenses for the long-term benefits. Despite some limitations, cost–benefit analysis is a key tool for considering the present value of projects with long-term payoffs.

A common critique of cost–benefit analysis is that it typically ignores the distribution of costs and benefits. This is a critical point for inclusive SAI, which aims to ensure equitable benefits and costs from SAI projects. It is feasible to report disaggregated costs and benefits in addition to aggregate numbers with more detailed data collection. Data for gender and age disaggregated costs and time allocation can be drawn from data collection tools in Section 4, such as the leaky bucket, gender- and youth-sensitive VCA and the activity profile.

Scenario planning

Effective decision-making requires the anticipation of future changes. No one can predict the future, but scenario planning is a tool that can help groups (communities, farmer organizations, agribusinesses etc.) to think strategically beyond the normal planning horizon. It has been used by business, governments and NGOs around the world with great success (Schwartz 1996; Schwartz 2011). In this tool, decision-makers consider a set of plausible futures based on possible changes to factors of extreme importance to a group. Led by a facilitator, participants develop detailed descriptions of a few future scenarios and reflect on the implications for current actions. The focus is not on accurate prediction, but on asking the question what can we do now to be better prepared for any of these scenarios? (Figure 18).

Define focal issue, question, or decision and relevant timeframe review past events & alternative interpretations
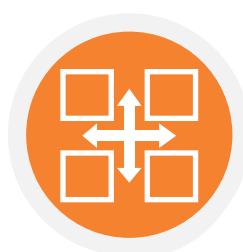

| Identify driving forces | Identify critical uncertainities | Develop plausible scenarios | Discuss implications & paths |

Source: Mariton (2016).

Figure 18 ▶ The scenario development process

Box 19 ▸ Facilitation of the scenario planning tool

| Exercise	Scenario planning tool
Time	1 to 3 days depending on the depth and complexity desired
Application	In-depth exercise for envisioning future scenarios and planning for those possibilities strategically. Applicable for broadly setting a direction in contexts of high uncertainty.
Preparation	Engaging an experienced consultant or providing a staff person with significant training in scenario planning is highly desirable
Facilitation	Scenario planning is often used with the following steps (Mariton 2016): 1. Identifying driving forces: Anticipating future changes and their potential impacts requires the consideration of trends in relation to various factors outside the group's control. Participants involved with scenario planning brainstorm the driving forces important to their field of work and develop those that seem most important in more detail. Business leaders use the acronym PEST for political, economic, social and technological factors. Trends in these external factors may be important to consider in the first step. The group may be able to use data from the tools in section 4 about economic and social trends related to gender and youth in agriculture. 2. Identify critical uncertainties: These are important factors that significantly affect the group but have a wide range of plausible outcomes. Participants choose what they see as the two most important factors to analyze further. These are the critical uncertainties. Multi-voting or a decision matrix may be useful in choosing those factors. 3. Develop plausible scenarios: Once the critical uncertainties have been chosen, participants develop plausible future scenarios for each uncertainty by imagining different trajectories for the factors in those uncertainties. Writing a few paragraphs describing what might happen for each could be a useful exercise. While it is possible to create innumerable scenarios, a simple way is to create a matrix (Figure 19) for different outcomes of each of the critical uncertainties. Schwartz (1996) warns against oversimplifying, such as imagining a good, a neutral and a bad scenario. Instead, participants should develop scenarios that seem realistic and where there are significant opportunities and challenges. This aids in thinking strategically about what should be done now. 4. Discuss the implications and paths of each scenario: Participants take time to develop each scenario, either by writing a description of what the world is like, or even acting out a drama where they imagine being in that situation. Once everyone can imagine that future scenario, they then consider how it would impact their group. What could they do now to be more prepared for such circumstances? How could they be ready for surprising opportunities and be resilient despite unforeseen challenges? This is repeated for each of the scenarios. Finally, actions that would be helpful are compared across scenarios. Actions or strategic directions that would be useful across most or all scenarios are those that should be prioritized.
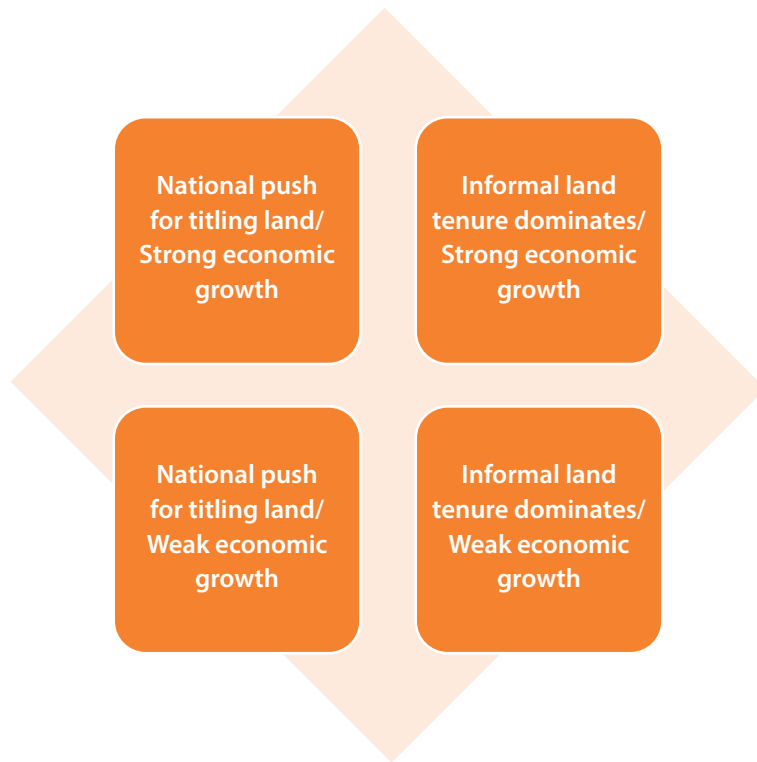
Figure 19 ▶ Example of four scenarios based on plausible outcomes of two critical uncertainties

6 | Conclusions

Working towards equitable SAI requires care and attention. Careful data collection can aid in detecting inequities early, anticipating negative impacts and mitigating them through changes in implementation plans. This guide provides a set of ten participatory data collection tools that do not require substantial resources in terms of finance, time and operational capacity but will need well trained facilitators. In addition, the set of seven decision-making tools can help organizations to understand the data and to avoid 'paralysis by analysis'.

Data collection tools identify inequities through *ex ante* assessments and early monitoring, but they can also be integrated into a gender-transformative process that seeks to change norms that perpetuate inequities. Equitable SAI requires creating a space where all voices are heard and attended to, including farmers, extension workers, traders and policymakers, women and men, young and old.

Too often, however, data is collected and written into a report that is never used to further influence decision-making. Thus, after data on youth and gender equity has been collected, it is critically important to include community members and other stakeholders in decision-making processes. This will aid in effectively addressing the complexity of working toward inclusive and equitable SAI. The decision-making tools provided are primarily intended for use by project teams, but they can also be adapted for participatory use with communities or other stakeholder groups depending on the specific context.

Working towards equitable SAI requires both timely information and an effective process for using that information to guide how interventions are rolled out. Decision-makers are encouraged to apply these data collection and decision-making tools in a participatory framework of humility and collaborative learning to ensure SAI is both fairer and more inclusive.

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About Africa RISING

The Africa Research in Sustainable Intensification for the Next Generation (Africa RISING) program comprises three regional research-in-development projects supported by the United States Agency for International Development as part of the US Government's Feed the Future initiative. Inaugurated in late 2011 and currently in its second phase (since September 2016), the purpose of Africa RISING is to provide pathways out of hunger and poverty for smallholder farm families through sustainably intensified farming systems that sufficiently improve food, nutrition and income security, particularly for women and children, and conserve or enhance the natural resource base.

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