

CONSIDERING GENDER WHEN PROMOTING SMALL-SCALE IRRIGATION TECHNOLOGIES

Guidance for inclusive irrigation interventions

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PURPOSE OF THIS TOOL

Many actors promoting irrigation technologies in low- and middle-income countries want to ensure that men, women, and different social groups have equal opportunity to participate in and benefit from irrigation but are uncertain how to do so. This tool provides a guide and structured set of questions to assess gender dynamics in irrigation in a specific context. The questions can be used to collect information prior to, during, or after project implementation to inform different strategic approaches of the project, including gender-sensitive marketing and dissemination strategies, design of technologies, risk mitigation approaches, adaptive management, and/or monitoring and evaluation (M&E) activities.

Actors who are designing and/or promoting irrigation technologies – development practitioners, agricultural extension agents, agribusiness companies working with contract farmers, and irrigation companies – can use the tool to better understand the gendered constraints and opportunities around small-scale irrigation (SSI) technologies, which are typically used by individuals, households, and small groups.

The question set helps identify gender-related barriers and differing preferences around accessing information about a technology, adopting it, and benefiting from it after adoption, including who will likely be able to participate in and benefit from a given irrigation project and who will not, as well as how the adoption of irrigation technologies can affect power dynamics between people. These areas of inquiry should be tailored to the local context and inform project strategies that ensure inclusive and equitable benefits from irrigation.

A project that does not explore these kinds of questions is effectively “gender-blind” and runs the risk of unintentionally worsening gender inequality and exclusion. For example, irrigation projects can inadvertently increase men’s control over income, assets, and production while increasing women’s workloads.

In addition, the tool supports research into the needs of different customer groups. Often irrigation users are assumed to be male by default, and promotion strategies fail to account for women’s distinct priorities and challenges. The questions in this tool can inform user-centered design approaches to develop products and services related to SSI that women prefer. In addition, it can help refine market segmentation and marketing strategies to reach women. Understanding and addressing women’s irrigation needs can serve to expand the user base of SSI technologies.

Table 1 summarizes the potential uses of the tool over the course of the project cycle for different purposes:

Table 1 Potential uses of the tool over the project cycle

Prior to implementation	During implementation	After implementation
<ul style="list-style-type: none"> Identify possible constraints to reaching women or marginalized groups 	<ul style="list-style-type: none"> Monitor risks and project impacts on different groups 	<ul style="list-style-type: none"> Evaluate differential effects of the project on direct beneficiaries (women and men) and indirect beneficiaries
<ul style="list-style-type: none"> Identify possible risks associated with the project 	<ul style="list-style-type: none"> Solicit feedback from users, stakeholders, and project staff 	<ul style="list-style-type: none"> Unpack the mechanisms driving the observed effects
<ul style="list-style-type: none"> Identify differences in preferences and priorities by user group related to technology design and dissemination approaches 	<ul style="list-style-type: none"> Adapt implementation strategies 	<ul style="list-style-type: none"> Assess evidence gaps based on previous data collection
<ul style="list-style-type: none"> Set M&E targets and indicators that meaningfully capture the participation of women and other groups 	<ul style="list-style-type: none"> Test and compare different approaches and consolidate learning 	<ul style="list-style-type: none"> Solicit feedback from users, stakeholders, and project staff

Source: Authors.

GENDER CONSTRAINTS TO TECHNOLOGY ADOPTION

Studying gender dynamics is examining how men and women interact. These patterns differ substantially across contexts. In some settings, men and women jointly own and share revenues from irrigation investments. In other contexts where there is less cooperation within the household, husbands and wives may control “separate purses” – independent revenue streams from largely separate production activities. How husbands and wives (and other household members) currently share resources and labor is important to assess in the project setting to anticipate how irrigation activities will affect different members of the household. This can provide insights about how to engage men in support of greater equity and inclusion, such as supporting their wives’ participation in women’s producer groups or training.

In addition, women are clearly not a homogeneous group with the same vulnerabilities and preferences. Marital status and household structure influence women’s opportunities and challenges. Salient social differences may also include age, ethnicity, caste/class, religion, and whether women have young children who require care and supervision or older/adult children who assist with some of the labor of running the household and farming.

The questions in this tool help to characterize how these intersecting forms of identity differentiate women’s experiences and needs, so that project managers and researchers can investigate the specifics of women’s experiences rather than operating on the assumption about how they are excluded.

We generally differentiate three phases of technology adoption: awareness, initial adoption (tryout), and continued use. Women face particular challenges in each of the three phases: becoming *aware* of SSI technologies, *adopting* SSI technologies, and *benefiting* equally from these technologies as they are used (Theis et al. 2018).

- ▶ **Gendered constraints to SSI awareness:** Even when information about technologies is disseminated with the intention of reaching everyone, this information may be less likely to reach women given women’s mobility constraints, lower literacy, less ownership of and access to mobile phones, and distinct social networks. In addition, social norms, safety concerns, lack of affordable transit options, and child care and household obligations can make it more difficult for women to travel to demonstrations or trainings that are, in theory, open to all. In some contexts, women will not feel comfortable participating in mixed gender activities or their husbands may prohibit them from attending. Women may also trust different information providers, such as health workers or community leaders, more than traditional promoters of technology, such as extension agents.

- ▶ **Gendered constraints to SSI *initial adoption*:** Both men and women face constraints to adopting new technologies, but constraints are gendered, and women often face additional barriers to adoption. Women who are female heads of household and women living in male-headed households encounter different constraints. Female heads of household often struggle with financial and labor-related constraints to acquiring a new technology, but as the primary decision maker in their household, they can choose to adopt a technology if they are able to overcome such constraints. In contrast, women in male-headed households may have greater financial resources and access to labor but lack sufficient decision-making power within the household to influence the decision to adopt a certain technology. For example, the primary male decision maker may have different preferences from women and undervalue the benefits of adopting a technology for women, such as reduced female labor. As a result, they may choose to adopt different technologies than women would, or adopt no technology at all.
- ▶ **Gendered constraints to SSI *benefits (continued use)*:** The benefits of SSI in promoting resilience, income, and nutrition are not always shared within households and may only reach women *through* their husbands or other household members. Intrahousehold power relations influence how the costs and benefits associated with the technology are distributed between household members. For example, women may contribute labor to operate the technology without necessarily controlling the profits from irrigated produce. For women living in households that adopt an SSI technology, they may see increases in workload without an increase in their control over earnings. Interventions that attempt to transfer irrigation technologies to women and designate them the “owners” may find that in practice, women have little control over the technology due to beliefs about who can own and operate certain assets.

While awareness is typically a pre-requisite for initial adoption, and initial adoption is necessary for continued use, one phase does not automatically lead to the next. Projects often find it easier to track awareness (e.g., number of people trained) or initial adoption (i.e., number of irrigation kits purchased or distributed), but many technologies that are initially adopted or acquired in some way are abandoned or set aside. Projects should investigate gender differences in each phase, what aspects facilitate transitions between phases, and identify which phase or phases hold back women’s inclusion.

To summarize, in each phase of technology adoption, there are specific risks of exclusion that should be identified and mitigated:

Table 2 Key risks of exclusion during the three phases of technology adoption

Phase of technology adoption	Key risk of exclusion	Examples
Awareness	Dissemination of new technology may unintentionally exclude women, so women never learn about the technology	Program disseminates information to a producer or water user group with all male members or at an event primarily attended by men
Initial adoption	Women are aware of the technology, but the technology does not benefit them adequately, or they do not have the resources or power required to adopt a new technology	Women see the technology being used but they do not have access to credit or support from their husbands to acquire the technology
Continued use	Intrahousehold relations and/or broader social norms constrain women’s ability to benefit from the new technology so women may discontinue use	The household adopts the technology, and women provide labor to operate the technology, but are unable to control earnings generated by use of the technology and so withdraw their labor

Source: Authors.

Background on the development of the tool

The questions and concepts featured in this tool were developed through an iterative process of field research and stakeholder consultation. An initial workshop series was held in 2016 in Ethiopia, Ghana, and Tanzania to gather feedback from researchers, government officials, implementing organizations and donors on key questions on gender dynamics in irrigation, as part of the Feed the Future [Innovation Lab for Small-Scale Irrigation](#) (ILSSI). Qualitative research was then conducted in these countries under the same project to test an initial set of questions. These questions were further refined through qualitative fieldwork for the [REACH programme](#). For this, researchers from the International Food Policy Research Institute (IFPRI) and the Ethiopian Development Research Institute/University of Bonn conducted in-depth interviews and focus-group discussions with 120 men and women irrigators and non-irrigators in 8 kebeles in Ethiopia's Tigray, Oromia, and Amhara regions in May-June 2017.

Structure of the tool

The tool includes two components: Part 1 includes a series of general and specific questions to explore the risk of inequity and exclusion while Part 2 focuses on approaches and indicators for monitoring, learning and evaluation as follows.

- ▶ **Part 1, Assessment questions:** Key questions are provided for each phase of technology adoption – awareness, initial adoption, and continued use – to identify gender differences and potential risks of exclusion related to the adoption of irrigation. The questions explore potential causes of the risk of exclusion and how the project may affect gender and social dynamics. The questions in the left column of Table 3 help to identify whether there is a risk of exclusion, while those in the right column provide more detailed questions for projects.
- ▶ **Part 2, Approaches and indicators for measuring inclusion in irrigation projects:** Possible project approaches and indicators are provided that can be used as is or adapted for use in M&E efforts.

PART 1: ASSESSMENT QUESTIONS

Awareness

- ▶ **Key Risk:** Dissemination of new technology unintentionally exclude women, so women never learn about the technology.

Table 3 Key questions for investigating the risk of a gender gap in awareness of the technology

Key questions	Questions for projects
<p>1. How do men and women hear about new technologies and practices?</p>	<ul style="list-style-type: none"> • Do dissemination efforts tap into existing networks (e.g. farmer's organizations, water user groups, existing relationships with extension workers)? Who participates in those networks? Are they predominately male? Are efforts made to reach women in their networks (e.g. self-help groups, health centers, etc.)? Women may not be in networks that receive information or invitations to participate in an event. • If husbands are primarily targeted for dissemination, do they share information they receive with their wives and other household members? • Who has access to the cell phones, radios, or other technologies used to disseminate information? Where are flyers or billboards posted? Are these spaces where both men and women gather? Who is able to read the flyers and other information provided?

2. What are the constraints to participation in trainings, demonstrations, farmer field days, and other outreach events? Are they different for men and women?
 - Is the location and timing of the event safe and appropriate for women to attend?
 - Do project activities help overcome social constraints on women's mobility or secure approval from other household members to participate? Is information provided to other household members in order to support women's involvement?
 - Are provisions made to facilitate women's participation, for example encouraging spouses or family members to participate together?
3. How do farmers learn about the technology and build trust to try it? Are men and women receptive to different kinds of information, demonstrations, types of learning events, or who the extension agent/lead farmer is? How does the relationship with the information provider affect uptake?
 - Do women express comfort and learn as much as men do from the lead farmers or extension agents demonstrating the technology?
 - Does the program support household members in sharing information with others in the household?
 - Does the program take measures to help women secure the support of other household members for implementing change or making new investments?

Source: Authors

Initial Adoption

- **Key Risk:** Women are aware of the technology, but the technology does not benefit them adequately or they do not have the resources or the power required to adopt a new technology.

Table 4 Key questions for investigating the risk of a gender gap in the initial adoption of the technology

Key questions	Questions for projects
1. What are men and women's preferences regarding the design of the technology?	<ul style="list-style-type: none"> • Do women perceive the SSI technology as providing sufficient benefits compared to costs/risks? Are the technologies designed to address women's preferences and/or are gendered preferences reflected in project information? • Are women's preferences and priorities regarding physical design, initial and on-going cost, financing options, potential for multiple use, location, shared vs. individual, and maintenance requirements incorporated into technology design?
2. Do women have sufficient access to and control over land needed to apply the new practice/technology?	<ul style="list-style-type: none"> • Does the project support women's access to (often more expensive) land, that is suitable for irrigation (e.g. within access of a canal or shallow well)? • Does the project help strengthen women's tenure security, allow them to invest in the land, use the SSI technology, and be assured the investment will not be appropriated by someone else?
3. Do women have sufficient access to and control over water needed to apply the practice/technology?	<ul style="list-style-type: none"> • Are the criteria for membership in the water user association (WUA) inclusive of women, and do women participate in meaningful ways? Do women agree with the rules set by this WUA? Do women feel they can influence or are represented well by this WUA? • Are women included in water access rules, even if water access is linked to requirements to maintain common water resources like cleaning canals which often exclude women? • Does the project support women to make investments in water storage on their land that can then be used for irrigation?

4. Do men and women have access to the financial services required to be able to invest in the technology?	<ul style="list-style-type: none"> • How do sources of formal and informal credit differ for men and women? • Is credit accessible to women of different marital and socio-economic status? Is credit available under favorable terms for women's desired irrigation investments (long enough repayment period, acceptable interest rates and collateral)? • Do women access credit for individual or joint purchase of technology, either through groups or with their family? • Do other household members support women in taking out credit? Do women access credit in support of other family members' purchase of technologies?
5. Do men and women have the means to generate sufficient revenue through the use of irrigation to make it economically viable?	<ul style="list-style-type: none"> • Do women expect to benefit from the technology and value these benefits? • Do women think they can control the proceeds generated from the technology? • Do women have access to markets to sell outputs from production?
6. How does labor availability affect technology adoption decisions?	<ul style="list-style-type: none"> • Does the head of household/primary decision maker value saving women's time/reducing women's work burden through adopting SSI technologies? • Do men and women have sufficient access to labor (own, family, or hired) to apply the technology? Does the project help women overcome labor constraints?

Source: Authors.

Continued Use

► **Key Risk:** Intrahousehold relations constrain women's ability to benefit from the use of the new technology.

Table 5 Key questions for investigating the risk of a gender gap in continued use of the technology

Key questions	Questions for projects
1. How is the technology used, by whom, on whose plots of land, and who makes decision over the technology?	<ul style="list-style-type: none"> • If men and women cultivate/manage separate plots of land, whose plots are included in the use of the technology? • Who physically operates the technology? Do men and women both know how to use it? • Who provides what type of labor to the application of the technology? How does this affect overall time burden and energy expenditure, for whom?
2. How are the benefits from the technology distributed within the household? Who controls the proceeds?	<ul style="list-style-type: none"> • Are men and women both informed about the revenues generated by use of the technology? • Who has decision-making power over how these revenues are used? Do women have a say over the proceeds from the use of the technology?
3. What resources are required to maintain the use of the technology?	<ul style="list-style-type: none"> • Do men and women have knowledge about how to maintain the technology or are they able to hire someone to fix it when broken? • Can women and men pay for the operation and maintenance of the technology?

Source: Authors.

PART 2: APPROACHES AND INDICATORS FOR MEASURING INCLUSION IN IRRIGATION PROJECTS

All M&E indicators collected should be disaggregated by sex and any other social differences deemed relevant for the given setting (such as age, marital status, ethnicity, religion, household structure, and socioeconomic status). Sex-disaggregated indicators can most accurately measure progress on closing gender gaps by comparing change in the indicators for men and women. If there are resource constraints, some indicators can be collected for men only or women only to measure absolute change in indicators by gender on a particular issue.

Table 6 Project approaches and illustrative indicators

Phase of technology adoption	Project approaches	Illustrative indicators
Awareness	<ul style="list-style-type: none"> Disseminate information about new technologies through men's and women's groups Enlist trusted people that regularly interact with men (e.g., extension agents, technology or agro-input dealers) and women (e.g., health workers) to share information Train women lead farmers to demonstrate to other women farmers the benefits of technology Promote events, trainings, and farmer field days that provide child care, at appropriate locations and times of day, and encourage women to attend Ensure that other household members are informed and supportive about women's participation in an event or activity Develop marketing campaigns targeting women Leverage platforms that women currently use to access information (e.g., radio, cell phones, social events, market days) 	<ul style="list-style-type: none"> Number of women exposed to demonstration or training about the technology Number of women aware of the technology Number of women lead farmers trained Number of women participating in training/events (with/without other household members) Number of women consulted on marketing/dissemination campaigns
Initial Adoption	<ul style="list-style-type: none"> Work with different women and women's organizations to understand their preferences regarding irrigation and water technologies design, pricing, individual vs. group ownership, marketing approaches, and training Support women producers to rent irrigated land through credit or subsidies; negotiate with village leaders to allocate land to women When women make irrigation investments on their land, ensure they have secure land tenure to avoid expropriation Support women's inclusion and leadership within water user associations; eliminate discriminatory membership provisions Enhance availability of credit for irrigation investments, including improving lending terms to allow for longer repayment window Provide subsidies for women to acquire technologies individually or jointly with husband or women's group 	<ul style="list-style-type: none"> Number of women consulted on technology preferences Extent to which women approve of the technology Number of women with joint or individual decision-making power over irrigated land % increase in women reporting enhanced tenure security over irrigated land % of water user association members and leaders who are women % of beneficiaries of water from collectively managed source who are women Change in water user association rules to better include women
Continued Use	<ul style="list-style-type: none"> Initiate household and community dialogues for men and women to reflect on distribution of labor and control over income generated from irrigation 	<ul style="list-style-type: none"> Changes in attitudes regarding women's control over income and use of SSI technology

- Enhance women producer groups' connection to markets and to market information to sell irrigated produce
- Train men and women on drilling wells and maintaining SSI technologies
- Register ownership of technologies in women's name
- Promote financial products and services that facilitate women's control over income (e.g., mobile money platforms)
- Support female heads of households and labor-poor women in finding and hiring labor
- % increase of women reporting control over income generated by irrigation
- Change in men and women's agricultural labor
- Number of women trained to maintain/repair technologies
- Number of women registered as owners
- % women in adopting households who know how to use the technology

Source: Authors.

Irrigation project managers who want to know how they can ensure that women benefit from SSI technologies and who want to mitigate risks women might face to examine gender differences in each phase of technology adoption. Women have distinct challenges and preferences around how to learn about, adopt, and benefit from irrigation technology. While ideally the SSI technology itself should be designed to meet women's needs, the technology alone is not enough – the social context around women's awareness, adoption, and use of the technology also needs to be considered. Whether projects are seeking to ensure they do no harm, empower women, and/or reach a new market segment, identifying such gender differences in the process of technology adoption is essential for developing inclusive irrigation.

Related Resources

Theis, S., N. Lefore, R. Meinzen-Dick, and E. Bryan. 2018. "[What Happens after Technology Adoption? Gendered Aspects of Small-Scale Irrigation in Ethiopia, Ghana, and Tanzania.](#)" *Agriculture and Human Values* 35, 3: 671–684. Doi: 10.1007/s10460-018-9862-8

Theis, S., N. Lefore, E. Bryan, C. Ringler, and R. Meinzen-Dick. 2017. "[Integrating Gender into Small-Scale Irrigation.](#)" Feed the Future Innovation Lab for Small-Scale Irrigation Project Note.

Theis, S. 2018. "[Can irrigation both empower and exclude women?](#)" Agrilinks blog.

Lefore, N. 2017. "[Ensuring women's access to irrigation in the household: Beyond quotas.](#)" Agrilinks blog.

[REACH programme](#) website and [Feed the Future Innovation Lab for Small Scale Irrigation](#) website

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