

FEED THE FUTURE INNOVATION LABORATORY FOR SMALL SCALE IRRIGATION (FTF-ILSSI) PROJECT NOTES

II. Integrating Gender into Small-Scale Irrigation

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Small-Scale Irrigation (SSI) interventions, like other development interventions, need to take into account men's and women's context-specific roles in agriculture and their related gender-based preferences and challenges. Understanding gender differences related to SSI technologies can help us improve targeting and better anticipate and monitor the impact of technologies on different people. Gender analysis is relevant to any SSI program, whether it seeks to avoid harm to women, to serve both men and women, or to advance women's empowerment.

In Ethiopia, Ghana, and Tanzania, the Innovation Lab for Small Scale Irrigation (ILSSI) has conducted three streams of research related to gender aspects of SSI:

- Field tested packages of technologies and analyzed men and women's perceptions of technologies. Technologies ranged from manual (e.g., rope and washer) to solar pumps and also included irrigation scheduling tools.
- Collected and analyzed qualitative data on men's and women's roles related to different SSI technologies.¹
- Collected and analyzed baseline data using a modified Women's Empowerment in Agriculture Index (WEAI).

Based on these analyses, we find high potential for SSI to improve livelihoods for women and men farmers. But we also identify a lack of equal opportunity for women and men farmers to enter into irrigated production and benefit from it. Furthermore, adopting SSI will almost always affect gender roles and relations in some way, so SSI diffusion is not gender-neutral.

In this brief, we synthesize several lessons learned about promoting SSI uptake based on ILSSI gender research thus far. We organize these lessons around three phases of technology adoption:

- (1) becoming aware of the technology,
- (2) trying out the technology, and
- (3) continued adoption (wherein farmers use the technology and decide whether to keep using the technology, based on their direct experience).

ILSSI research shows that men and women face different constraints at each of these stages. SSI projects can mitigate these constraints with a better planning process, which should begin with understanding these constraints in the project context. In this brief, we suggest approaches to identify and address these constraints to guide inclusive diffusion of SSI in different contexts.

Ways to Address Identified Gendered Constraints to Awareness of Technology

- **Investigate how women and men learn about new technologies in different ways in order to reach both women and men.** Ensure invitations to trainings, meetings, and outreach events reach both women and men, acknowledging that reaching women may require different approaches and channels than reaching men. It is not safe to assume that men will tell their wives or family members about such events, so projects should make an effort to contact women through their existing social networks and/or encourage men to inform and include their wives. If invitations are being made by calling farmers, note that women might be less likely to own cell phones, and may not hear about the training from a household member who owns a cell phone.

¹ Theis, et al. 2017. [What happens after technology adoption? Gendered aspects of small-scale irrigation in Ethiopia, Ghana, and Tanzania.](#)



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- **Identify barriers to men's and women's participation in groups.** Understand who feels comfortable participating in training activities around the technology, based on where and when the meeting is held and who will be in attendance. It may be more appropriate for women to participate in public events if husbands and wives are encouraged to attend together, or if women attend single sex groups. Mixed-sex meetings may be appropriate in the same village but not in a distant location. If women-only groups or events are initiated, ensure that men have information about the purpose of these groups so that they support women's attendance or do not block it. Providing adequate information and answering questions in advance of the event, scheduling meetings in safe and convenient times and locations, assisting with transportation costs, and providing child care or allowing children wherever possible will reduce gender-based barriers to participation and allow more people to learn about the technology.

Ways to Address Constraints Around Try-Out of Technology

- **Investigate gender differences in preferences for the design and location of technology.** Technologies can have a range of benefits beyond profit and productivity, including time savings and providing an improved water source for domestic purposes. Men and women often prioritize different benefits and therefore have preferences for different technologies, which affect their willingness to invest in a specific SSI technology. ILSSI research suggests that men tend to prioritize profit and labor savings while women tend to prioritize profit and the potential for multiple uses of water, which also entails saving time and labor. Women particularly valued SSI technologies installed near the homestead that could be used for domestic as well as productive purposes, and they preferred to irrigate lumpier crops that could be harvested many times during the year and crops that were important for direct household consumption. SSI projects should not assume men and women value the same technology equally, for the same purposes and reasons. Offering technologies that are preferred by both men and women can increase try-out.

- **Make credit accessible to both men and women to invest in SSI.** International Water Management Institute research under ILSSI found that investing in SSI on credit could have a payback period of between 6 months to 2.5 years depending on technology, crop value, and access to markets. Lenders are generally unfamiliar with lending for irrigation investments in the typical African rainfed farming context but become interested in lending for irrigation as a risk management measure, reducing weather-related risk of crop failure.

However, women have much lower access to credit, due to constraints within and outside the household. Outside the household, women may lack requirements to get a formal loan, have limited financial literacy and numeracy or knowledge of how to take out a loan, and loans may not be structured to meet women's needs. At household level, how decisions are made about borrowing may prevent women from taking loans. Repayment periods should be compatible with the irrigated agricultural cycle (e.g., allow repayment to occur after harvest and sales and, given the relatively large technology cost, allow for gradual repayments over several seasons).

- **Investigate whether labor availability is a disincentive to adopting SSI technology.** The presence or absence of family labor can affect adoption decisions. Highly labor-constrained households, such as female-headed households, may not favor SSI given the cost of hiring laborers to irrigate. For other households with available family labor, primary decision makers may prefer to draw on "free" unpaid labor, rather than invest in costly but time-saving technologies. Increasing recognition of women's work burden may help to encourage decision makers in the household to value technologies that save women's time. Labor-constrained households may benefit from sharing irrigation labor. ILSSI field studies suggest that some women feel that male laborers do not respect them and thus do not do thorough work; in these instances, projects can take measures to help strengthen women's supervisory capacity over laborers.

- Help women secure access to and control over land and water resources to irrigate.** People need access to land and a water source in order to use SSI technologies, but land that is close to a canal, river, or shallow pond or already has a water source is often more expensive to purchase or rent, and investing in a new well on an existing plot of land can also be costly. Irrigation programs may end up excluding women and other vulnerable groups due to lack of access to adequate land and water resources. In addition, insecure land tenure may discourage investment in irrigation, given the risk of losing control over land, especially if irrigation increases its value. Some programs extend access to irrigated land to individual women or groups of women by facilitating fair rental or purchase through credit or subsidies.

Gendered Constraints Within the Household During Continued Adoption

- Be aware that transferring technologies to women will not necessarily ensure women control the technology.** Projects that aim to transfer SSI directly to women may give women ownership of the technology in name only. Given intrahousehold power dynamics, the “adopter” of technology does not necessarily hold all rights to the technology within a household, such as the ability to sell the technology or control the benefits from the technology (See Figure I below for how we define four intrahousehold rights to a technology in terms of use, management, fructus, and alienation). Conversely, all rights to a technology are not likely to be shared equally among household members. Some household members may use the technology while others may control the benefits.
- Investigate who within the household provides labor and who controls income from irrigated production and avoid conflating use of technology with control.** Identify which household members hold different rights to SSI technology to understand how SSI adoption alters

intrahousehold roles and relations. Women often play a “helper” role in using SSI technology without having a say over how it is used (management rights), control over its outputs (fructus rights), or ability to sell, give away, or lease out (alienation rights). The use of a technology may reflect women’s knowledge of a technology and ability to operate it. However, the use alone of a technology does not guarantee other rights, and may simply represent greater labor burden in the absence of other rights.

- Ensure that women benefit from the proceeds of irrigated production.** While household relations vary from family to family, women are generally less likely to have control over the income from irrigated produce, even if they contribute their labor to its production. While women value household-level income, they also strongly value their own control over income. Fructus rights need to be systematically highlighted as both a gendered impact of technology adoption and a factor affecting motivation to try a new technology. Women’s fructus rights can be negatively affected by information asymmetry over the sales of produce, the prioritization of irrigation on men’s plots of land, and non-cooperative household relations.

To fortify weak or eroding fructus rights, encourage shifts in intrahousehold relations for more cooperative decision making over income (for example, through household dialogues/whole-family approaches); increase women’s access to markets, information on prices and sales, and financial services that allow for individual control over revenues; and/or work outside the household (for example, through women’s groups renting irrigated land or SSI technologies). Be aware that crops that women traditionally manage may be appropriated by men when they become profitable under irrigation.

- Ensure that SSI technologies reduce women’s time burden.** SSI technologies can offer multiple benefits. Proximity to the homestead of SSI technologies, especially in combination with a new

water source (e.g., well) or water storage (e.g., shallow pond) can reduce overall labor required for collecting and transporting water for multiple uses and smooth seasonal variation in water availability. Furthermore, homestead water points can facilitate the irrigation of homestead gardens, which women mostly manage and may use to generate their own earnings. Projects could partner with water supply efforts focused on water, supply, sanitation, and hygiene (WASH) and offer SSI technologies and training to users when a new water point is installed. WASH self-supply initiatives could also be leveraged for multiple use by offering SSI technologies as add-ons.

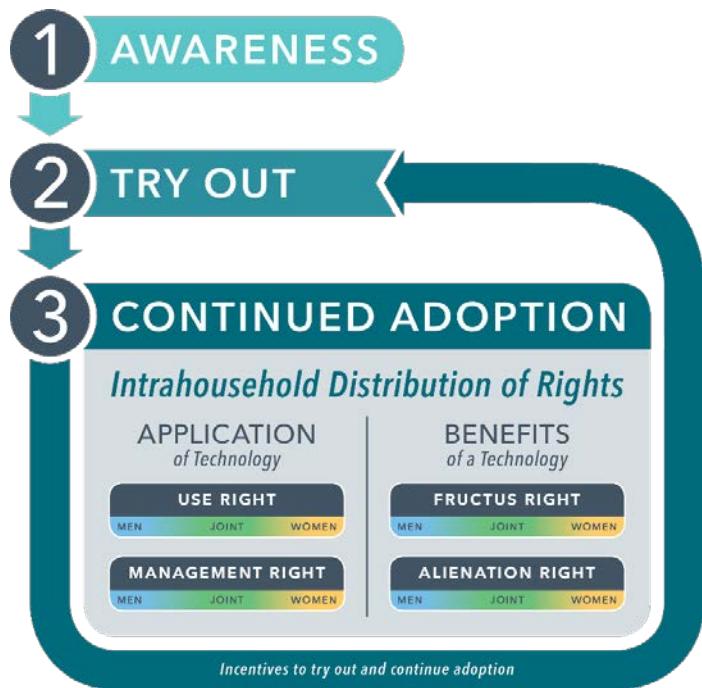
Intrahousehold Rights to Technology

The ILSSI gender and technology adoption conceptual framework shows three phases of technology adoption: awareness, try-out, and continued adoption.

The framework unpacks the **continued adoption phase**, when farmers are using a technology and deciding whether the benefits are worth the costs. Costs and benefits from technology adoption are not equally distributed within the household. Many projects suffer from “dis-adoption,” especially when donors or implementing organizations leave, so to achieve sustained benefits and reinvestment by stakeholders, continued adoption of a technology is

critical. In many cases, a technology may be more likely to be used if all household members value the technology and believe it is worth continuing.

The framework highlights four rights to a technology. If we look at who in the household holds which of these rights, this helps us understand who is bearing the costs and who is claiming the benefits of the technology, rather than assuming they are shared equally or exclusively by one person.



Right	Definition	Example
Use	The right to use/physically operate the asset	Carry and lay out the pipes of the pump, operate the motor, secure the water source
Management	The right to make decisions about how, when, and where to apply the technology	Decide to use the irrigation pump on family and women-managed plots of land
Fructus	The right to control outputs and profits from irrigated production	Control the proceeds from sales of the irrigated crop
Alienation	The right to sell, lease, or give away the technology	Lease out the pump to a neighbor for revenue without needing to ask for permission

The intrahousehold distribution of rights influences the impacts of SSI technologies. In addition, expectations about how these rights will be distributed may also affect women's (and potentially men's) incentives to adopt technology. For example, anticipating that they will struggle to claim fructus rights may discourage women from participating in a new project, or keep them in low-productivity activities that allow them to retain unchallenged fructus rights. In the framework figure, we have an arrow leading from continued adoption to try-out to illustrate this.

Further promotion and research into so-called female-friendly technologies should consider not only technological design that facilitates women's use of the

technology, but also modes of introducing technologies that enhance their claims to other rights as well. Women not only want technologies that they can use, but also technologies that generate benefits they can control.

References

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