

Section 8 – Making small-scale irrigation technology work for women

Sophie Theis, a former Senior Research Analyst at the International Food Policy Research Institute talks about gender issues in small-scale irrigation technology. Sophie is talking about gender challenges for small holder farmers in general but these points are equally valid for farmer-led development of irrigation.

Watch the PowerPoint from Sophie's presentation (<https://youtu.be/Hi5dghn3G7s>).

Presentation Transcript

In this presentation, I'm going to discuss how irrigation engineers and policy makers can develop and promote small-scale irrigation technology that works for women. I'll discuss why women currently do not have equal ability to adopt irrigation technology, why this is a problem and how we can change this. I'll be focusing on small-scale water lifting and application technologies such as motor solar tidal pumps and drip kits.

I'm drawing on experience gained in the 'Feed the Future' Innovation Laboratory for small-scale irrigation supported by the US Agency for International Development (USAID) as well as through the REACH program supported by Department for International Development (DFID). Links to papers that describe gender and irrigation in more detail are provided on the final slide of this presentation.

To begin with, why is small scale irrigation not working for women?

All available studies have found a gender gap in the adoption and use of irrigation technologies in developing countries. This means two things: first, men are more likely than women to practice irrigation; and, second, among those who do irrigate, men are more likely to use mechanised technologies to lift and apply water, technologies such as the diesel pump (shown in the presentation), while women are more likely to use labour-intensive manual methods such as buckets, shown in the picture on the right. This gender gap in the use of irrigation reflects the reality that women do not have the same opportunity to adopt and benefit from irrigation technology as men do.

Let's look now at why this gender gap in irrigation matters. Why do women need irrigation technologies? We'll think about all the benefits of irrigation. Women are also farmers and, in fact, make up about 43% of the on-farm labour force in developing countries – they may need irrigation for the same reasons men do. In addition, they shoulder a larger overall labour burden than men do because of their many unpaid household responsibilities – cooking, cleaning, caring for children, collecting fuel and water.

Thus women need irrigation technologies to improve their own agricultural production, reduce their drudgery, save time and produce nutritious food in the dry season. More specifically, irrigation technologies can support women farmers in the following ways. Such technologies can help them generate income through higher value produce, higher yields and an extended growing season. They can help women grow more nutritious crops that withstand weather variability and climate stresses. They can give them access to a water supply for multiple purposes in addition to crop growing, eg for drinking and cleaning, for livestock, and so on. They can improve family health and reduce the burden that falls on women of caring for the sick, as well as reducing women's own time and energy burden of collecting and using water.

Which kinds of women are we talking about here? Women farmers have different needs that vary by context and by other aspects of identity, such as education, wealth, class, ethnicity, land ownership status, and so on. In addition to these important categories, we need to distinguish between women in female-headed households and women in male-headed households. These two groups face different challenges and opportunities. As a result, different strategies for reaching them with irrigation technologies are required.

Female heads of household have no spouse or adult male living with them. They might be widows, divorcees or unmarried women. This group is often marginalised and has less access to resources and to labour. However, compared with women in male-headed households, they may have more decision-making power and mobility. So it might be less difficult for them to decide to adopt irrigation technology but more difficult to afford the technology or find the labour to apply it.

In contrast, women in male-headed households may have more access to resources and to labour but less decision-making power and autonomy than female heads of household. Often we think in terms of the household unit but decades of research have demonstrated that household members do not share all resources and income equally. This means that, if a male-headed household adopts irrigation, the wife in the household does not necessarily see the same benefits as her husband. For example, she may provide labour for irrigation but have no say over how the income generated is spent. Women's control over income matters for gender equity and also because research shows that, when women have control over income, they spend more on children's health and education.

So when we talk about reaching and benefiting women with irrigation technologies, we should be aware that strategies may need to be tailored to different kinds of women in the specific context where we are working. It is also important to note that comparing female with male heads of household is not adequate, because this leaves out the majority of women, who live in male-headed households. So we also need to look at dynamics within male-headed households. Given what we've discussed thus far about why women need irrigation technologies and how they have different needs depending on their identity and the household in which they live. What can we say about why there is a gender gap in the adoption of irrigation technologies?

The next part of this presentation will discuss how women face specific barriers to adopting irrigation technology. Of course, men also face barriers but women often face more and different kinds of barriers than men do simply by virtue of being born female. Men and women are treated differently, have different opportunities and face different social expectations about what they can and cannot do. The reason we do this research and give presentations like this one is to advance our understanding of what such gender-based barriers are, so that we can remove them and give women an equal chance to adopt these important technologies. And there are specific actions which irrigation engineers and policy makers can take to contribute to this goal.

One common mistake is to focus only on the act of technology adoption, say buying irrigation equipment. That single moment of purchasing or acquiring a technology, however, exists within a whole process of technology development, dissemination and use. When women are left behind, it might be at any point along this whole process, not just at the point of purchasing a technology.

In addition, we want to know what happens after new technology is adopted and how doing so affects men's and women's well-being.

If we imagine a situation one year after the purchase of a new technology, we can consider a process that includes technology design, dissemination, adoption and use; this will help us see more clearly where women might be left out and where there are opportunities to include women. So for each

stage we can ask the following questions. Starting with the design phase we can ask: do existing technologies meet women's needs and what are women's needs and preferences around the design of an irrigation technology? In the phase of disseminating or marketing it: what barriers do women face in learning about the technology and how do these differ from those facing men when adopting the technology? What other barriers do women face compared to men? And what barriers do they face after the technology has been adopted and is being used? How does this affect men and women differently? Who benefits and who bears the costs?

Let's look at how each phase here can better serve women, starting with the design phase. We're motivated to understand women's specific preferences as users of irrigation equipment so that they actually become customers and want to adopt the technology.

Design Phase

What are some of women's unique needs and preferences regarding the design of the technology? Well, these are going to be context-specific but technology designers and policy makers can ask where, when and for what purposes women want irrigation and water technologies. Some issues to investigate include whether they want the technology for multiple uses, like irrigating crops, domestic use and livestock watering; for this, the location or portability of the technology may matter. In addition, what is women's willingness to pay for the technology, to acquire it and to operate it? How much of the operational costs and what type of costs are women willing to take on? These would include the cost of fuel and maintenance and the human energy required to operate the technology. Policy makers should also consider women's preferences around financing options, including whether they prefer to purchase or rent technology individually or jointly with a husband or with a group. They can assist in making financing options available through subsidies or special credit lines for women. Finally, design should also consider whether women feel comfortable, given their social context and norms, operating certain technologies.

As an example, in the innovation lab for small-scale irrigation (ILSSI) research in Ethiopia, women expressed a preference for technologies that were labour saving, allowing them to use water for multiple purposes during multiple seasons and which were installed near the home so that they are suitable for home gardens. These are all considerations to explore in the specific setting where you are working to design appropriate technologies with and for women. Therefore once technology is designed that meets women's needs, we need to make sure information about the technology reaches women. So let's look at the phase of dissemination.

Dissemination

Note that traditional ways of reaching farmers with extension don't necessarily include women. For example, women may not have permission to attend or may not feel comfortable participating in farm or field schools trainings and demonstrations with producer groups, especially if it's mostly men that are attending and facilitating.

If producer groups, cell phones or extension agents are used to disseminate information about a new technology, women may very likely not receive the information, as they're often not members of male-dominated producer groups, are less likely to own cell phones and are less likely to interact with extension officers or irrigation equipment dealers. However, we can meet women where they are and, if we recognise that these channels are not reaching women, we can either adjust the channels or use new channels that tap into women's specific networks, such as women's savings groups, frontline health workers or recruiting lead farmers from among a group of women.

For any channel of disseminating information, we do need to make sure the women trust the information provider and feel comfortable asking questions, so that they can make an informed decision about adopting the technology. Next let's look at gender considerations in the moment of adopting technology. We'll look at what barriers women face compared to men in adopting the technology and what resources they need in order to purchase it.

Adoption

Most of the time when we're talking about technology adoption, this is through the purchase of irrigation equipment, although sometimes people will receive equipment through a project or will rent it. But let's say someone wants to buy irrigation technology and can afford it. What other resources does this person need? Research in Kenya found that men are more likely to buy irrigation pumps with loans and that women who bought pumps did so with cash. In many contexts this reflects the fact that access to credit is much more challenging for women than men. Women often need the consent of their husband to take out credit and can struggle with 'know your customer' requirements such as providing ID, a credit history or collateral in order to receive it. In addition, adopters of irrigation need to have access to complementary resources such as local land, water and labour to practise irrigation. Yet women are often strongly disadvantaged on these factors. Land ownership or drilling wells can be prohibitively expensive and other options like joining a water-user association and negotiating for water rights might not be open to women because of the social norms in these organisations. Furthermore, as we discussed earlier, women in male-headed households need to have the power within their family to make the purchase, and may need the consent and support of their husband.

Finally, irrigated agricultural production needs to be sufficiently profitable to pay back any credit that is taken out. Keeping in mind that, for more expensive equipment like motor pumps or solar pumps the payback period is often greater than a single season and repayment terms need to allow for this time, let's look at what happens after technology adoption, when a technology is being used. How are men and women affected differently, and do women actually benefit from the technology they adopt?

Use

First, men and women, even within the same household, may experience different costs and benefits associated with a new technology. For example, we can study how the workload changes around irrigation, considering all the tasks of irrigating and cultivating produce during the year. We can examine who within the household has the power to decide how the technology is used, on whose plots of land and who controls the income generated.

At the community level some instances of technology adoption may cause wage labourers to lose employment. In other cases, women and other less powerful actors may lose their rights to water and to land. So we also need to look at how different groups of people within a community are affected differently by technology adoption.

Further, if we want to support women in truly benefiting from technology, we need to help make it a profitable venture. The irrigator needs market access to buy inputs and sell the product, business skills, and access to agricultural information and financial services. However, we also need to ask: profitable for whom – do women have any control over the income that is generated by irrigation?

From the research conducted by ILSSI in Tanzania, two women described how they laboured with their husband cultivating irrigated produce over the year. But in the end their husbands ended up selling the rice they produced at a local warehouse. The women say that, “where ownership is concerned, it's a father or husband who claims it, because he signs for the sacks at the warehouse and even sells the produce. You won't even know of the amounts, whether he gives you a fake calculation. You just have to accept”. Another woman says. “You can't go daily to check them [the sacks] since you aren't the one who signed for it inside there. Because his fellow men will think of me oppositely, so I just remain at home.” This raises the point that if we want irrigation technology to benefit women, we need to be aware of risks, such as loss of control over income.

Some of the risks to keep in mind are thus that women do not necessarily have access to, and control over, the profits of irrigated production. Although there are things, that can be done to increase their chance of sharing in the control of irrigation profits with their husband.

Transferring technologies to women may not guarantee their control either. If men in the household are not supportive, they will take control instead. For instance, in a case study in Ghana pumps were distributed to women. But most respondents, both men and women, answered the question of ownership by saying that men were the owners of the pump, despite the project having specifically given the pumps to women.

We also need to be careful that any irrigation technology introduced does not increase women's time burden excessively. Finally, more powerful actors within the family or outside it may appropriate land, income streams or water sources from women after they make investments in irrigation that make their land or produce more valuable. Thus efforts to help women secure their land and water tenure and defend their rights to these resources are needed to ensure that the benefits of technology adoption accrue to women.

What can irrigation engineers and policy makers do to ensure that women have an equal chance of benefiting from irrigation? Here are several ideas. They can design technology with women to ensure it meets their needs, studying women's priorities and preferences. They can ensure marketing, dissemination and extension approaches actually reach women so that they learn about the irrigation technology and how it is used. They can support women's ability to purchase technology by providing access to finance, appropriate subsidies and groups. They can help secure women's access to and control over irrigable land and to water for irrigation and, importantly, they can monitor and evaluate gender-related outcomes after technology adoption, both within the household and within the community. In this way they will be able to see whether women are reached, helped and empowered by the technology.

Suggested further reading:

[Introduction to the Gender in Irrigation Learning and Improvement Tool](#)

Acknowledgements

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