Section 7 – Practical interactions between engineers and farmers

Our job is to learn from each other and find more innovative irrigation system – Mohammed Nouri, Assistant Professor, Water Resource Management

In this section you'll learn about:

- how you communicate your role to farmers;
- how you can learn from farmers;

The Farmer versus the Irrigation Engineer

Consider these attributes often assigned to farmers and engineers. Do you agree with these labels?

Farmer	**Irrigation Engineer**
Informal	Formal
Inefficient	Efficient
Traditional	Modern

Do we as practitioners feel that to move to the more professional model farmers must learn from us? Or is the learning mutual?

Scholars in the 1970s promoted linear models of thinking and often said that public irrigation schemes failed because of the farmers' lack of knowledge, or because farmers don't follow instructions. In these instances, the farmer is to blame when something goes wrong.

However, we should ask ourselves how the farmers see the technologies promoted to them. How do they imagine the reaction between water and soil or different technologies?

If we think like an engineer, we have technical descriptions for describing the various aspects of our work. People working on farms have the same experience as us of irrigation and agricultural concepts but will use a different terminology.

We may assume a farmer's lack of knowledge, but it's our own specific jargon that limits understanding. We must learn to listen and communicate with farmers to benefit from their empirical knowledge.

Working between farmers & engineers with Louise Sibusiso Nkomo

Hear Louise Sibusiso Nkomo, a project leader in water management in Zimbabwe, describe the challenges she sees in her role working between farmers and engineers.

Watch the video: https://www.youtube.com/watch?v=CP1TkxLVnkE

Video transcript:

Successful irrigation has always been an interaction between the engineers and the farmers. Now the common, most visible problem is that the engineering side of the technology side has always advanced way faster than what the communities themselves can adapt to or can use. So this is where the challenge lies: what is required or what is wanted is for us to eliminate the myth that traditional or former irrigation practices are inevitably not efficient or effective. Instead, farmers working together with engineers can always come up with ideas or systems that are and can be used by the farmers themselves.

Mohamed Naouri on being an expert in the field

Mohamed Naouri, Assistant Professor at the Department of Agronomy at Université Mohamed El Bachir El Ibrahimi de Bordj Bou Arréridj, Algeria, gives an example of when he went into the field as an 'expert' and attempted to impose his understanding on smallholder farmers.

As an irrigation engineer in the field, and with experience of working for a public Algerian company, I was used to a linear model of innovation and of thinking how best to bring new technologies to farmers.

At the time I was studying towards my PhD and on my first day in the field I entered a greenhouse and saw a young man using technology like in the image below:

Naouri, Mohamed. Greenhouse. Arusha, 2019

When I saw this I thought, "I'm an engineer, they are already using this technology, it will be an easy thesis. I will only need one and a half years instead of three."

I asked the farmer "What kind of irrigation system are you using and how do you manage it?" He replied, "As you can see, we are using drip irrigation.". As an irrigation engineer, I imagined a drip irrigation system and had a picture of the basin or container, a pumping station, filters, the central fertigation unit and a distribution network. So I asked him to show me the water basin or the container. I also expected to see fertigation units and filters.

In reality, what I saw was this…

Naouri, Mohamed. Irrigation System. Arusha, 2019

I asked again "What system are you using. Is it really drip irrigation you are using?" He replied "Yes.". So I asked to see the water basin or the container for the water. And he said "We don't have a container or basin, we don't really need it.". So I asked, "When you take the water from the tube well, where do you put it? Where does it go?" He took me outside and showed me this,

Naouri, Mohamed. Water column/tower. Arusha, 2019

"The water goes in this water column," he said. I replied "What's a water column and how do you use it?" And he said, "Are you sure you're an irrigation engineer?".
I then asked to see the filters. He said "We don't use those, we threw them away. The irrigation engineers at the time brought them to us but they are not useful in our area." Since this time I have seen numerous irrigation systems like the one I saw that day.
Then I said, "Okay. You don't have basins and you don't have filters but you really need a fertigation unit.". He said "Yes, but this is what we use…" and he held up two jerry (watering) cans.
I thought it would be an easy thesis but it took me more than 3 years to understand all of this. I told the farmer "I am going to stop thinking like an irrigation engineer" and I asked him to draw me his irrigation system.
Farmer-led irrigation systems may look very different from text book examples, but engineers and researchers should respect this and try to understand the ingenuity of local farmers. Unorthodox irrigation systems that have been adapted to suit local contexts can be extremely effective.

Ensuring farmers are engaged in irrigation developments with Miguel Tafula

Miguel Tafula is an irrigation engineer in Mozambique. He talks about a project he is working on and how he ensures farmers are actively engaged in irrigation developments.

Watch the video: https://youtu.be/YTSEKWOWK2c

Video transcript

It's very important to identify farmer champions because they are the ones who have the ability to influence other farmers and can also help in terms of integrating the farmers into our activities.

We don't elect a champion farmer – we consider a farmer who is knowledgeable but is self-motivated and emerges naturally. We identify the champion by seeing the motivated farmer who also has the ability to influence other farmers and also to explain what we are doing in the local perspective.

So a champion leader is a very important factor during the implementation of new technologies, new innovation platforms. Also they are the one who influence the other farmers and motivate them to participate in each activity we are developing.

They're the ones who are responsible for demonstrating the new techniques that we want to implement and also they are the ones who coordinate all fields of activities. We don't do it by ourselves – we make them understand that they are leading the different activities that we want to promote in the field. We are just facilitators to introduce the new technologies. But it is the farmers who lead and who coordinate the introduction of new technologies and it is the champion who is responsible for demonstrating the new technologies to them.

Translation tips

Mohammed Nouri explains the importance of ensuring farmers understand the new technology.

How? You demonstrate.

Photo by Steve Johnson on Flikr

"When I was in the field the first thing i did is explained to farmers how groundwater works, using a container with water in it and a sponge. When I put the sponge into the water it was demonstrating this (container) is the reservoir, this is what is happening under the ground, and the sponge is the soil.

This is the water we can use. But we can't use all the water we have here, because when you take the sponge out of it, only the water that drops can you take from the groundwater. The water that stays in the sponge we can't really use it."

A tip for better communicating with farmers is to provide short information for them to consider.

For example, telling farmers that only 1% of water stays in the plants, and that most of the water goes into the air and the soil is shocking information that helps them think about how and when they bring water to plants.

Key messages:

- Failure of irrigation schemes should not be assumed to be due to a lack of farmers' knowledge. Such an assumption would overlook farmers' experience and engineers' inability to communicate due to their frequent use of inaccessible, technical terminology.
- Successful irrigation depends on interaction between engineers and farmers. Engineers and farmers need to learn from one another and collaborate to find more innovation irrigation systems.
- Effective communication with farmers should provide concise information for them to consider, with visual props and examples.

Suggested further reading:

Small-scale farmer innovation systems:
https://quno.org/sites/default/files/resources/SSF%20Innovation%20Systems%20-%20Literature%20Review.pdf

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