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## New Fish Feed Technology Changes Production in Sierra Leone

In Sierra Leone women fish farmers collect the ingredients for fish feed, mold the mixture into balls, and toss them into ponds. This is food for tilapia, a fish integral to their livelihoods, and they are using a new fish feed formulation introduced by World Fish. The women are responsible for daily care of the fish, but they have limited control over how resources are used; easier access to quality fish feed could open economic opportunities.

This technology is new to Sierra Leone and is geared at increasing agricultural productivity and incomes. However, we must look deeper to understand potential ripple effects on men's and women's lives. Do both men and women have access to technologies like these? How do women farmers benefit from them? Do innovative technologies allow both men and women to increase their incomes?

As part of the Integrating Gender and Nutrition within Agricultural Extension Services (INGENAES) project, Cultural Practice, LLC (CP) developed a methodology to explore the relationship between agricultural technologies and gender issues as a means of understanding the

potentially different ways that men and women benefit from innovations. CP also has been providing training to researchers and practitioners on how to apply the methodology. From the inland valley swamps in Sierra Leone to the terraced hilltops of Nepal, researchers and practitioners used the methodology to examine the ways technologies can respond to men's and women's different needs and lead to higher incomes and healthier outcomes for men and women.

In January 2017, student researchers from Njala University and University of Illinois conducted a series of interviews with men and women fish farmers, agro-input dealers, and extension officers as part of a technology assessment of improved fish feed. WorldFish is now using the findings

*"I learned the design of technologies does not always take into consideration context and how technologies will be used by people, both men and women."*  
- Colby Silvert, training participant and WorldFish Extension Coordinator in Sierra Leone

from the assessment to address gender issues in the project. For example, student researchers identified that women farmers in Tonkolili District were unable to purchase fish feed ingredients because of the distance to input dealers and lack of affordable transportation. Using this finding, WorldFish, under its Scaling up Aquaculture Production Project, is mapping the geographical locations of fish feed input dealers to identify viable transport options for women to overcome this constraint.

While a technology can be designed to easily maneuver a terraced terrain, it might not fit the preferences of men and women. Student researchers from Nepal's Master in International Cooperation and Development program (MICD) learned that women farmers in Kavre District, Nepal, were not using a small mechanized plow, called a mini-tiller, instead preferring to group together to till the land by hand or pay men to operate the mini-tiller. Women, even with a shortage of men due to migration, were not operating the mini-tiller because of beliefs that women should not plow or were unable to plow as easily as men. With fewer men on farms this meant women's increasingly busy days and tight budgets were further constrained by a time-intensive or costly options for tilling.

MICD students using the technology assessment methodology developed ideas to encourage women to use mini-tillers that would make sense in those communities. Sumana Parui, a consultant and engineer working with the International Maize and Wheat Improvement Center to disseminate and train farmers to use the mini-tiller, said the issues raised through the assessment are a "stepping stone for studying the involvement of women with technology ... not only in the rural hilly areas of Nepal but also in other developing countries."

The technology assessment methodology provides a framework that can be applied to understand the potential or emerging opportunities and constraints to men and women benefitting from investments in agricultural technologies. The new "Assessing how Agricultural Technologies can change Gender Dynamics and Food Security Outcomes: A toolkit" developed under INGENAES by CP outlines a process for understanding how agricultural technologies can be designed and disseminated to reach both men and women farmers. It focuses on three areas of

inquiry where agricultural development, technology, and gender issues intersect: time and labor, food availability, and income and assets. The toolkit is a resource that can be used by researchers, project implementers and extension officers to enhance their work and ensure that men and women farmers benefit from higher incomes and healthier outcomes through adoption of agricultural technologies.



Aunty Gladis demonstrating how to make fish feed in Aquaculture Fish Pond in Tonkolilli district. © INGENAES, Rastogi 2016

The assessment methodology was piloted in Bangladesh, Zambia, Nepal, and Sierra Leone between 2015 and 2017. The pilot consisted of two components: 1) Design and delivery of training materials and 2) Production of technology profiles. Four workshops were delivered with practitioners and university students (graduate and undergraduate; from both developing countries and the United States) to test the methodology. The workshops also offered insights into the framing and content of this toolkit. During the pilot phase, eleven technology profiles were produced either in conjunction with the workshop or as a separate activity, describing the gender dimensions of technologies such as beehives and digital fat testers to mini-tillers and treadle pumps as well as integrated farming practices related to fish ponds and gardening.

Learn more about the toolkit and technology profiles here: <http://ingenaes.illinois.edu/technology-toolkit>

Cover photo: Aunty Gladis demonstrating how to make fish feed in Aquaculture Fish Pond in Tonkolilli district. © INGENAES, taken by Rastogi in Jan. 2017

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