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A Christian Response to Hunger

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Extension Approaches in the Promotion of Agricultural Innovation

What is extension?

Traditionally extension has been an approach where information from researchers has been transferred to farmers through extension personnel that work directly with farmers. The information flow in that case was top down and generally assumed a lack of knowledge by farmers and hence there was no feedback from the farmers. Over the years extension has evolved from such top-down approaches to more two-way approaches which include participatory extension, farmer field schools, etc. In some cases extension is now termed "communication for development" which emphasizes the importance of dialogue/ feedback.

Beatrice Acen, extension worker in Kotido Uganda, learns together with farmers in a Farmer Field School approach

Why is extension important?

Extension can help farmers adopt new technologies, markets, and farm management skills. Effective agriculture extension empowers farmers. However the success of extension, especially in introducing new technologies, depends on how well it addresses the farmer's needs, and to what extent the farmer participates in deciding their destiny. Thus, it is crucial that we review our extension approaches as we introduce new technologies to communities.

Participatory extension approaches used to promote agriculture innovations

With these methods, farmers are involved in problem identification, and the extension agent serves as a facilitator, guiding problem-solving strategies with farmers. Active farmer participation is encouraged from the design stage, through implementation and evaluation of an innovation. There are many variations of this approach, including farming systems research, participatory technology development, look and learn visits, participatory rural appraisal, farmer field schools, farmer to farmer extension, and lead farmer approaches. This article will focus on two participatory approaches that are most popular in the CFGB network: Farmer Field Schools and Farmer to Farmer approaches.

Farmer Field Schools

Farmer Field Schools (FFS) are adult experiential learning tools where farmers experiment with a particular technology topic (e.g. Conservation Agriculture). A farmer field school has four elements, a group of farmers with common interest, a field where the training is done, a curriculum to be followed, and a facilitator who can be an extension agent or an FFS graduate.

Farmers learn together on a particular topic with the assistance of an extension agent who plays a facilitator role. For more tools and guidance on FFS methodology, visit http://www.care.org/work/world-hunger/farmers-field-and-business-school-toolkit.

Farmer-to-farmer extension

This is a common strategy employed by many partners in the CFGB network. Farmers are selected as lead/model farmers to train other farmers. Lead farmers should not be chosen at the very beginning of a project. The best lead farmers to choose are those who have used the promoted technology on their own farms and have already begun showing their neighbours. The extension agent usually trains and works with lead farmers to disseminate information to up to 10 other farmers, usually in a group. The lead farmer may receive an allowance or may work on a voluntary basis. For more on Farmer to Farmer strategies visit (https://dl.dropboxusercontent.com/u/15810717/Technical%20Notes/MEAS%20TN%20Farmer%20to%20Farmer%20-%20Simpson%20et%20al%20-%20May%202015.pdf)

Farmer Field Schools and farmer-to-farmer extension systems are becoming increasingly important, especially in areas where public extension systems are weak. Rather than just promote technologies, they build the capacity of farmers to innovate and work together. Because of this, their impact is sustainable long after the end of a project.

Most projects have a limited lifespan, and extension agents need to adhere to what is in the project proposal and do what the donor needs. This often results in a lack of farmer involvement. Development agents need to balance the needs of the donor and of the farmer. How can we as development agents apply the principles of participatory extension without ignoring the requirements of the donor?

Green Manure/Cover Crops

The fertility and productivity of African soils is declining throughout the continent. In the time of our grandmothers, when a field stopped producing, it was allowed to lie fallow for several years. During this time, weedy plants and shrubs grew, and decomposed, rebuilding the soil with rich organic humus.

Today, the scarcity of land has made fallow periods difficult or impossible. Nonetheless, we can still rebuild soils by using green manure/cover crops (plants that improve soils by producing abundant organic matter and keeping soils covered like happens during a fallow period). The ideal cover crop is a species that can be planted together with a grain crop and produces food for humans and livestock as well as restoring soil health.

In maize production the ideal cover crop is a species that can be planted alongside a grain crop and produces food for humans and livestock as well as restoring the soil. All three of these crops can be planted with maize without competing unduly with the main crop. As the maize approaches maturity, the cover crop begins growing more vigorously, enriching the soil and eventually producing grain for human consumption. In order to maximize soil improvement, plant late-maturing varieties of these crops rather than early-maturing varieties that die off quickly.

Ntate Palamang Ranku (second from left) of Lelinyane, in Lesotho is encouraging other farmers in his area to practice CA

How Can We Make Extension Support Effective And Sustainable?

- **Involve farmers at all times- active participation and decision making is key**
- **Be a facilitator, not a teacher**
- **Appreciate indigenous knowledge**
- **Give farmers options, not prescriptions**
- **Encourage farmers to experiment**
- **Build the capacity of local farmers**
- **Follow up training with field visits**
- **Plan for an exit strategy**
- **Collaborate with other stakeholders**

Extension is no longer about knowledge transfer; it is about empowering farmers to solve their own problems and decide their destiny!

A Sustainable Green Manure/Cover Crop System Must:

- **Incur no cash costs**
- **Cause no appreciable increase in labor**
- **Provide benefits in addition to improving the soil**
- **Have no opportunity cost**
- **Cause no significant changes in the existing farming systems**

Adapted from Roland Bunch (to download Mr. Bunch's book on green manure/covercrops, go to http://foodgrainsbank.ca/uploads/Restoring%20the%20Soil.pdf)

For later-maturing crops, like cassava, millet or sorghum, the best cover crops are quick-growing, early-maturing legumes like early-maturing cowpea, common beans, and groundnut. These plants provide early-season ground cover, and some nitrogen fixation, but finish their growth cycle in time for the main crop to take over. Lablab and pigeon pea generally compete too much with late-maturing crops like cassava, however, we are currently experimenting with jackbean and bushy lablab varieties that may provide a good fit.

Other benefits of cover crops

As we visit conservation agriculture programs throughout Africa, the most common constraint we hear is the lack of material for soil cover. Dry mulch becomes more and more scarce as more farmers in a community begin practicing CA, and crop residues are often in short supply as they are needed for feeding animals. Without adequate soil cover (our goal is a minimum of 30% cover throughout the year) the full benefits of CA will not be realized.

Leguminous cover crops can produce abundant nitrogen to fertilize next year's grain crop. Lablab, for example, can produce the equivalent of up to 150 kg urea (300 kg CAN) per hectare. Since nitrogen is often the most limiting, and the most expensive, fertilizer element in grain production, cover crops can save farmers a significant amount of money on fertilizer costs.

Cover crops, such as lablab and pigeon pea produce high-quality animal forage, in fact their feed value is much higher than maize stover and other grain crop residues. By feeding these materials, farmers can keep their livestock healthy, while leaving crop residues for soil cover. Keep in mind, however, that whatever biomass you remove to feed animals will reduce the amount of nitrogen contributed to the following crop. One strategy is to remove the tops of the plants for animal feed, but to leave the roots and vines for the soil.

Which of these cover cropping systems do you think would be most beneficial in your farming system? Let us know if you would like more information on growing cover crops or obtaining seed.

Lablab grows underneath the maize canopy when it is young...

...but takes off after the maize is harvested, producing abundant soil cover and food for humans and livestock.

Discussions From the Network

Felix Ncube: In as much as we promote use of crop residues as mulching material for our CA plots, one needs to realize other uses of the residues that farmers consider very important… Crop residues are considered very helpful for farmers living in some dry parts of Zimbabwe where livestock herbage is very limited and thatching grass is not available… It is very difficult to attain even 5% ground cover, and for this reason it's wise to use cover crops. We are learning a lot from Kenya and Tanzania where they posted cereal crops intercropped with lablab and velvetbean proved that it's doing well. How can I effectively introduce one of these legume crops to farmers?

Vusa Moyo: Cowpeas will be fine for a start, until farmers realise the effectiveness of cover cropping, then other green manure cover crops can come in. The pic shows potential of cowpeas (CBC2, Zim) as cover crops, seen here 60cm in-row at 90cm rows.

Neil Miller: I saw lots of cowpea varieties in Kenya last week. Some they say can stay alive through the harsh, Kitui dry season. If this is the case, we need to collect and promote cowpea, not only for short-term cover and quick grain production, but also as a longer term cover crop.

The CA Technical Officers manage a Facebook Discussion Group from which the above conversations were copied. If you'd like to join the discussion, sign up at www.facebook/CAinAfrica.

Partner Profile: Africa Inland Church of Tanzania, Shinyanga Diocese Kishapu Food Security and Nutrition Project

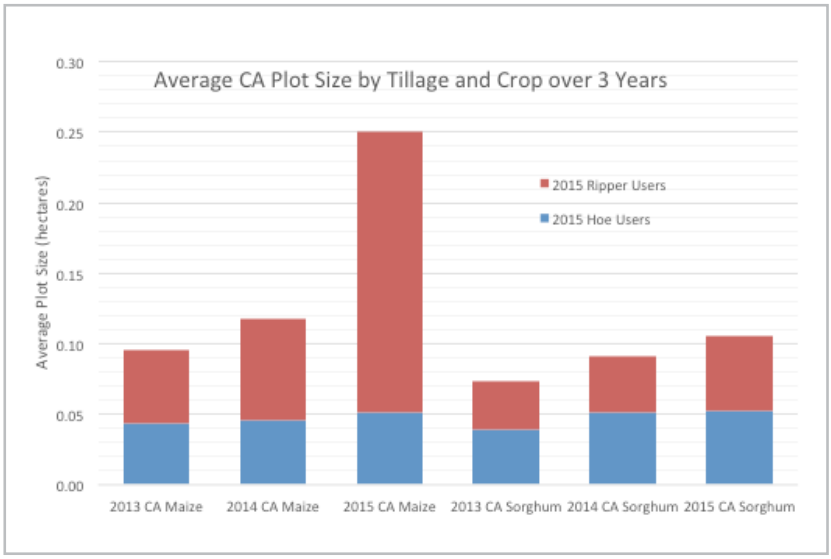
AICT Diocese of Shinyanga launched the Kishapu Food Security and Nutrition Project (KFSNP) in 2012, with the goal of reducing food insecurity by introducing Conservation Agriculture. Shinyanga is one of the most drought-prone areas of Tanzania, receiving only 400-800 mm annual rainfall. In response to a drought in 2011-2012, AICT, Presbyterian World Service & Development and Canadian Foodgrains Bank collaborated to provide food aid. Following this, a longer-term solution to food security was sought. Staff were trained in the Farming God's Way approach, and received further on-location training from Chrispin Mirambo of Mennonite Central Committee.

In the 2012-2013 season, 160 farmers were trained, and 142 farmers successfully planted CA maize and sorghum, while many of the rest had trouble finding mulch. CA yields were excellent (2.1 tons/ha maize and 2.2 tons/ha sorghum) despite limited rainfall. The 2013-2014 season was much wetter, and although CA maize yields increased to 2.7 tons/ha, all crops in the region produced much better than normal, and the comparative advantage over conventional crops was smaller.

In the third year of the KFSNP, project staff introduced ox drawn rippers and cover crops (lablab) in an effort to help farmers expand their CA. Plot sizes increased, especially for ripper users (see chart) but mulch was increasingly hard to source, especially for larger fields, and thus many of the plots lacked soil cover. February and March were extremely dry, and crops suffered, with conventional maize averaging 140 kg/ha and sorghum 200 kg/ha. CA yields were also low (800 kg/ha for maize and 670 kg/ha for sorghum), though they still significantly out-yielded conventional crops. Despite the drought, the lablab produced well, providing green vegetable (leaves) and beans when virtually all other crops failed.

Although two farmer-motivators were chosen from each village at the beginning of the project, their performance varied widely. However, according to the end-of-project survey, significant farmer-to-farmer training happened spontaneously with each KFSNP-trained farmer helping an average of 1.2 other farmers implement CA principles. While some of these spontaneous adopters did not implement all the principles of CA, their interest is evidence of the enthusiasm the project has engendered, and represents a ripe opportunity for further CA expansion.

Women, including Mary Ngassa, Hoka Jidete & Nyange Ngassa are among the most successful CA practitioners in the KFSNP.



CATO Schedule: Neil Rowe Miller

CATO Travel Schedule: Neil Rowe Miller

15-20 August
Bukavu, D.R. Congo
CA Training of Trainers for Partners of CBM, ERDO, MCC, and WRC

26-27 August
Limuru, Kenya
CA Systems Assessment Training

31 August - 1 September
Nairobi, Kenya
CA curriculum development writeshop

15-19 September
Rwanda
Partner visits and HG Buffet Foundation consulting

5-9 October
Mwanza, Tanzania
CA Systems Assessment Training

CATO Schedule: Putso Nyathi

24-25 August
Bulawayo, Zimbabwe
ERDO Partner Visit

26-28 August
Bulawayo, Zimbabwe
Ripper Training facilitated by ACT

7-11 September
Machanga, Mozambique
Non-CFGB CA project visit

28 September - 1 October
Chisamba, Zambia
Chipembi College (UCC) visit

5-9 October
Mwanza, Tanzania
CA Systems Assessment Training

27-28 October
Johannesburg, SA
Southern Africa CFGB CA Partners' workshop