

From the Editors: The first two articles in this issue of EDN share different perspectives on small-scale farmers' access to markets. In the first article, Dick Tinsley argues that small-scale farmers often prefer private service providers to co-operatives. In the second article, David Headley shares his positive experience with co-operatives, including characteristics of a strong co-op and an explanation of some benefits that farmers have experienced as members of a co-op.

Private Service Providers: Preferred by Smallholders

by RL Tinsley, Professor Emeritus, Colorado State University

Introduction

Like all farmers, smallholder farmers require support services to provide production inputs, to market surplus production and to contribute other services like contract mechanization (for land preparation, post-harvest processing, initial value added), credit, etc. Within smallholder agriculture communities private service providers (PSPs) normally provide these essential support services that, if forced to be undertaken individually, would distract from the primary economic activity of crop and animal husbandry. These PSPs are part of the well-recognized and promoted Small & Medium Enterprise (SME) system. Frequently, they may be more accurately referred to as the Family Enterprise System (FES). Such PSPs are usually indigenous to the communities they serve, and often represent former farmers who have drifted out of farming to become supporting service providers to their neighbors. These businesses are frequently owned and operated by women (Fig. 1), and often have such a limited market volume they operate near the poverty level^{ii,iii}.

This article takes a closer look at the PSP as represented by the FES. How effective are they in providing the bulk of the business services needed by smallholder producers? Are they a competitive alternative to the highly promoted farmer co-operative model?

The FES represents a highly fragmented business model, with each enterprise having a limited market volume. The best example is the massive government managed Talad Thai fresh produce wholesale market outside Bangkok. It covers 54 ha (133 acres) and includes several huge "warehouses". However, on close examination, it is all divided into small family enterprise units of perhaps 10 x 20 m of marked-off floor space. Each family handles one or two pickup loads



Figure 1: Woman owner of a small agro-dealership in Malawi that sells fertilizer, seed, etc. It also buys grain from farmers (mostly women) who market small quantities for immediate cash.

of produce per day. Usually the women hold the money and spouses oversee the handling of the produce, also supervising any porters or other casual laborers.

Within the context of developing countries, small family enterprises often manage the bulk of the economy, particularly the smallholder agriculture sector. They are the main link between smallholder farmers and the large agro industries that process and deliver food to the end consumer or exporters, and distribute inputs both of domestic and foreign origin. However, small family enterprises are often viewed by the host government and development community (anxious to promote the farmer co-operative model) as predators on smallholder farmers. Such condemnation is often put forth as fact without any

supporting analysis or documentation. This includes project "Request for Proposals" as the primary justification for mandating the use of the farmer co-operative business model^{iv}.

In reality, given the underlying suppressed economic environment, the relationship between farmers and FES is likely more symbiotic than predator/prey. The FES was spontaneously developed in partnership with the service recipients as a convenient means of providing needed services. They were developed to be both financially competitive and convenient, particularly where immediate cash services are important as part of an overall financial management strategy for smallholder farmers. With this strategy, farmers retain goods, both crop and animal, in-kind

Featured in this EDN

- 1 Private Service Providers: Preferred by Smallholders
- 4 Farmer Co-operatives
- 5 Echoes from our Network: Conservation Agriculture in Areas with High Rainfall
- 6 Books, Web Sites and Other Resources
- 7 Upcoming Events

ECHO is a global Christian organization that equips people with agricultural resources and skills to reduce hunger and improve the lives of the poor.

ECHO

17391 Durrance Road
North Fort Myers, FL 33917 USA
p: 239-543-3246 | f: 239-543-5317
www.ECHOcommunity.org

Private Service Providers (PSPs) are non-government businesses operating within a country. They range from the small family enterprises mentioned below to large international corporations.

Small & Medium Enterprise (SME) is a term used by the development community to designate private enterprises working to assist smallholder farmers. They would include both the FES mentioned below as well as larger enterprises that would have several employees, including mid-level supervisors.

The Family Enterprise System (FES) represents a sub-division of the Small and Medium Enterprise designation (SME), but is owned and operated by a single family. This FES designation may comprise most of the SME in the financially suppressed economy of developing countries; for some reason most private enterprises have difficulty expanding beyond what one family can manage. This may be because in an impoverished society with wages on the margin of survival, the temptation for pilferage and other means of getting a small advantage are so great that all activities have to be closely monitored by someone with a direct financial interest in the organization, such as a family member.

as long as possible, then sell only what is needed to meet immediate cash needs^v.

When the FES are in direct competition for the same commodity, such as coffee or pineapples, with development facilitated farmer co-operatives, the FES will be the beneficiaries of any side selling and as such often corner a substantial majority of the market share, including that of project members circumventing their by-law obligation to market exclusively through the farmer co-operative. This could be as much as 90% of the market volume, as is the case in Thailand and for fair trade coffee in Ethiopia^v. Under such open competition, the heavily promoted and facilitated farmer co-operative model market share may represent little more than loan repayments, severely restricting a co-operative's potential impact on poverty alleviation.

Finally, FES are the default providers when development efforts prove unsustainable once facilitation funding ends (as happens too often). In my opinion, the farmer

co-operative model is highly promoted for its social desirability, and reports are aimed more at appeasing funding donors rather than objectively evaluating the limited interest and participation from the smallholder beneficiaries. Reports often fail to include many of the basic business parameters that would demonstrate the farmers' willingness to participate but more importantly the degree of reliance on the project for the service offered, vs. diverting the bulk of their business to the FES as the preferred providers^{vi,v}.

Financially Suppressed Economic Environment^{vii}

Perhaps the most common feature of countries that host development projects is a financially suppressed economic environment serving an impoverished public. In this environment, consumer food prices of most locally produced foods (particularly vegetables, fish and price-controlled staple grains) are 1/3rd to 1/5th those in developed countries such as the USA or the EU (Table 1)^{viii}, but wages are only about 1/12th. This forces people to spend more than 80% of their income to meet basic food requirements. It severely restricts the buying power of the public, which then limits what the FES can charge consumers, and in turn limits the amount they can pay to the smallholder producers. As a result, the underlying business model for food production and delivery has to be highly efficient, especially when fuel prices for transportation are at a premium. In some remote areas, the off-tarmac transport cost can be triple that of highway transport^{ix}—a cost borne by the remote farmers. This restricts profit margins for family enterprise systems; the primary way they generate profit is by reducing the cost of doing business, rather than raising consumer prices. The economic realities also make it

very difficult for alternative business models such as farmer co-operatives to compete, unless they, too, are very cost conscious (e.g. avoiding additional support services such as extension advice or health clinics that have to be financed from the overhead charges^x). The financially suppressed economic environment also limits the tax base upon which the government relies for revenue that is used to provide civil services including agriculture support, education and health care^{xi}.

Private Market Channel (Value Chain)

In the effort to promote alternative business models for assisting smallholder communities, it is difficult to find detailed market channel analysis of either PSPs or farmer co-operatives. However, the example found in Table 2, for marketing tomatoes in Nepal, is typical of an FES operation^{xii}. In Nepal, most such systems involve two related families: an accumulating family at the farm community level, buying from the farmers, and a distributing family in Kathmandu, selling to the retailers. Wholesale dealers might market around 20 crates of tomatoes per market day—so trucks making the trip to Kathmandu with some 228 crates of tomatoes will represent the consolidated market volume of up to 10 pairs of wholesalers.

The consumer price in Kathmandu can be triple the nominal price received by the farmer, but still only 1/6th the USA consumer price (Table 1). However, the marketing channel is fairly efficient, with a total marketing cost of approximately US\$4.00/100 kg (18.86 – 15.06 = 3.80). This tends to remain reasonably constant throughout the tomato season, with much of the variation in consumer costs actually going to the farmer. After adjusting for the

Table 1. Consumer Price Comparison

Host Country	Comodity											
	Rice (kg)	Maize (kg)	Sugar (kg)	Veg. Oil (L)	Eggs (ea.)	Chicken (kg)	Fish (kg)	Tomatoes (kg)	Onions (kg)	Eggplant (kg)	Cabbage (kg)	Diesel (L)
Thailand	0.88		1.18	1.35	0.09	2.37	2.94	0.56	0.76	0.53	0.56	0.76
Nepal	0.36		0.71	1.29	0.07	2.14	1.86	0.43	0.43	0.50	0.21	0.81
Tanzania	0.66	0.23	0.78	1.32		3.12	1.95	0.78	1.17	1.17	1.17	1.00
Ethiopia	0.82	0.41	3.03	3.33	0.16	6.89	14.03	0.55	0.27		0.38	1.09
Kenya	1.22	1.22	1.50	2.31	0.11	4.42	2.72	0.54	0.82	0.82	0.54	1.02
Bolivia	1.07		0.53	1.73	0.07	1.87	1.07	1.07	0.34		0.11	0.53
Ave. Host	0.84	0.62	1.29	1.89	0.10	3.47	4.10	0.66	0.63	0.76	0.50	0.87
Ave. USA	1.32	2.84	1.22	1.33	0.25	2.89	11.90	7.76	1.65	3.50	1.30	0.73
Ratio	0.63	0.22	1.05	1.43	0.41	1.20	0.34	0.08	0.38	0.22	0.38	1.19

Source: <http://smallholderagriculture.agsci.colostate.edu/consumer-price-comparisons-usa-vs-host-country/>

Table 2. Marketing Cost Analysis for Delivering 100 Kilograms of Tomatoes to the Consumer in Kathmandu

Item	Weight Needed (kg)	Unit Cost (US\$) ^a	No. Units ^b	Cost/ 100 kg Delivered (US\$)
Purchase Price	126	12.54/ 100 kg	1.26	15.06
7% weight adjustment for damages at local market	117			
Shipping container (crate)	117	0.035/crate	4.18	0.146
Packing Material	117	0.016/crate	4.18	0.068
Packing labor	117	0.032/crate	4.18	0.135
Loading charge	117	0.032/crate	4.18	0.135
Marketing Tax	117	0.0485/crate	4.18	0.203
Transportation Cost	117	0.436/crate	4.18	1.823
Unloading in Katmandu	117	0.0485/crate	4.18	0.203
Market tax in Katmandu	117	0.0485/crate	4.18	0.203
Misc. charges for road taxes, overload fines, etc.	117	0.032/crate	4.18	0.135
Weight adjustment for respiration (4.8%) and damages (6%)	105			
Porter fees to retail stall	105	0.009/kg	105	0.945
Weight adjustment for losses at stall	100			
Total cost				18.86

^aBased on Dec/Jan average prices. All dollar values were converted from Nepal Rupees at US\$ = 55.0 Rupees

^bAssumes a plastic crate will hold 28 kg.

26 kg losses during the marketing process, the farmers receive from US\$41 to \$12 per 100 kg of marketed tomatoes (64% of the consumer price in the early season, when there are limited tomatoes available, down to 32% of the consumer price in mid-season when a glut of tomatoes is available). Meanwhile, the wholesaler traders receive from US\$6 to \$10 per 100 kgs of marketed tomatoes (15 to 30% of the consumer price). This is mostly well below the 35% overhead costs associated with marketing through farmer owned co-operatives (according to the Central Growers Association of Zambia, which concentrates on tobacco where they have monopoly control of the auction floor; most members side sell their other produce to the PSP)^{xiii}.

The much-maligned FES middle men make modest monthly incomes of US\$232 to US\$580, divided between the two related families (US\$131 to US\$290 per family), and depending on the number of crates marketed. It is not an excessive income, considering the financial risk involved. Limited income for smallholder farmers should be mostly attributed to the overall suppressed economy that limits the consumers' buying power, rather than to excessive profits by private traders. The latter provide a service at reasonable cost with high transport costs (such as fuel and vehicle spare parts).

Summary

Before looking at alternative business models (such as farmer co-ops) to support smallholder producers, I suggest that a detailed analysis of the indigenous FES model be compared to a detailed analysis of the proposed model. While often maligned as predatory to smallholders, the FES may actually offer a highly competitive service. Most of the substantial mark-ups can be attributed to legitimate business expenses, while the overall suppressed economy severely limits the consumer price and thus the profit margins. The resulting modest incomes of the middlemen will be difficult to compete with.

Unfortunately, very few detailed comparisons exist between PSPs and highly promoted farmer co-operatives. A competitive advantage is usually assumed for the latter, but the envisioned competitive advantage could easily disappear through the higher overhead costs, some of which can be easily predicted and accounted for^{xiv}. When part of donor-assisted poverty alleviation projects, the farmer co-operative model requires continuous and extensive external facilitation, then usually falters once the facilitation effort ends.

Business comparisons should be mandated by donors. If the FES proves more competitive and advantageous to smallholder

farmers, projects ought to shift their focus, to assist the FES to better serve smallholder communities and to enhance the poverty alleviation effort. Unfortunately, the farmer co-operative model is too often mandated in project documents with no opportunity to consider alternatives. As a result, implementers need to spin the reporting to appease donors, further entrenching models that the beneficiaries largely avoid, and preventing future projects from evolving to better assist smallholder beneficiaries^{xv}.

Footnote Links

ⁱ<http://smallholderagriculture.agsci.colostate.edu/1st-value-added-clean-bag-of-grain/>

ⁱⁱ<http://smallholderagriculture.agsci.colostate.edu/lusaka-tomato-vendor/>

ⁱⁱⁱ<http://smallholderagriculture.agsci.colostate.edu/banana-trader-uganda/>

^{iv}<http://smallholderagriculture.agsci.colostate.edu/perpetuating-cooperatives-deceptivedis-honest-spin-reporting/>

^v<http://smallholderagriculture.agsci.colostate.edu/financial-management-strategy-retain-assets-in-kind/>

^{vi}<http://smallholderagriculture.agsci.colostate.edu/request-for-information-basic-business-parameters/>

^{vii}<http://smallholderagriculture.agsci.colostate.edu/financially-suppressed-economy/>

^{viii}<http://smallholderagriculture.agsci.colostate.edu/consumer-price-comparisons-usa-vs-host-country/>

^{ix}<http://webdoc.agsci.colostate.edu/smallholder-agriculture/Off-TarmacTransportCosts.pdf>

^xIn the context of this article "overhead costs" are the sustainable overhead costs representing the cost to sustain the project once external facilitation and subsidies end. It would be completely unfair to include the external facilitation costs in this accounting.

^{xi}<http://smallholderagriculture.agsci.colostate.edu/financially-stalled-governments/>

^{xii}<http://webdoc.agsci.colostate.edu/smallholder-agriculture/CH4-MarketingTomatoesNepal.pdf>

^{xiii}<http://webdoc.agsci.colostate.edu/smallholder-agriculture/SMC-RLT-Report.pdf>

^{xiv}<http://smallholderagriculture.agsci.colostate.edu/loss-of-competitive-advantage-areas-of-concern/>

^{xv}<http://smallholderagriculture.agsci.colostate.edu/project-development-process-who-represents-the-smallholders/>

Farmer Co-operatives

by David Headley, MBA

David Headley currently serves on the Vision Trust Food Security team commissioned to find sustainable feeding solutions for impoverished children in 16 countries. He has traveled to and/or worked on agriculture projects in over 70 countries, mainly in sub-Saharan Africa and Southeast Asia. Those opportunities have given him a unique perspective on global poverty and food insecurity, and he has seen the ripple effect on low-income small-scale farmers. David also works with trade team logistics for the Illinois Soybean Association. He is a graduate of North Carolina State University and the University of Illinois.

This article will focus on the benefits of co-ops operating by and for small-scale farmers in rural communities in Sub-Saharan Africa. The most basic definition of a co-op is local farmers pooling their resources to improve the means of acquiring products essential to farming, as well as expanding market opportunities. The objective of a co-op is to increase a farmer's net income through expanded access to new markets and credit. However, in order for this to be successful, the group of farmers must decide on several factors: governance (who the elected committee will be), ownership (how to manage the co-op), self-regulation (a set of rules agreed upon by members) and accountability (to other members).¹

In my work with co-ops in Sub-Saharan Africa, I have found that they enable greater access to large markets compared to individual farmers selling harvested grain. The bargaining power expands to the whole group, increasing market value of the harvested product. Farmers in a co-op also pay less for inputs since the co-op can buy larger quantities at a discount. Farmers who belong to the co-op experience a customized cost savings and more cash flow.

In my experience with co-ops, cost savings have continued over several cropping cycles enabling farmers to begin to upgrade farming methods. For example, in Uganda, old implements were replaced to better farm the land. This meant less down time due to maintenance and repairs and often resulted in faster work with less labor costs. Small-scale farmers that were members of the co-op benefitted as their rate of return enlarged and their products were marketed more quickly. The profit per harvest climbed, while the potential of post-

harvest loss or other issues due to time lost in the field was greatly reduced.

Before one particular co-op was formed in Uganda, the farmers would have to drive the harvest to Kenya—several days' journey away. The long, bumpy drive caused grain to be spilled from the trucks. This, combined with costs incurred by vehicle ownership and use, caused farmers to lose money before they even got their grain to market.

By contrast, when farmers joined the co-op, either suppliers would come to them to collect the harvest, or (if they delivered the product) the distance traveled was greatly reduced because the co-op was able to secure grain purchases from larger buyers. As a result, the farmers' efficiency increased because they could spend more time in the fields or in markets close to home, as opposed to driving and delivering products far away. An added benefit is that the price for the crop is negotiated and set before harvest, which allows the farmer to know ahead of time how much his crop is worth.

One major goal of a co-op is to create a pathway to improvements in agricultural production. Rural co-ops improve agriculture in three ways that lead to prosperity for the farmers. First, the co-op educates farmers about financial decisions to help them protect their assets. This is the first step in being able to generate profit. Without co-op assistance, small-scale farmers will most likely continue to face negative returns. Second, the co-op seeks to educate a farmer on all aspects of agriculture, from inputs to marketing. He is taught about relevant venues for his sales, and is educated on fair prices for his goods—before formal engagement with market suppliers. Third, once a farmer has proper market knowledge, he can use the delivery services offered by the co-op, which keeps him from possibly undercutting himself through lack of understanding of the markets. Ultimately, aside from harvests and crops, farmers themselves are cultivated. Their newly acquired marketing business skills allow them to be successful both in the fields and in the marketplace.

In rural communities, other co-ops serve as community-based savings groups. Such groups provide a safe place for farmers to borrow money based upon their agricultural yield. Farmers are able to acquire loans once the harvest is delivered to the agricultural co-op. After the grain is accounted for at the co-op, the farmer is given a receipt which can be used at the local savings group co-op. The amount of the receipt varies depending on the commodity and price scale. This receipt system has empowered farmers, increased income (because the co-op, which can sell in larger quantities, could guarantee a higher price for the harvest), raised standards of living and provided a ready market for their harvest. The agricultural co-op centers know how to properly handle agricultural commodities, reducing potential losses due to bad post-harvest handling methods. Furthermore, this kind of system ensures farmers will not



Figure 2: David Headley meets with farmer co-op members.
Photo by Larry Bradley

have to deal with middlemen, who often offer extremely low prices.

I would be remiss if I didn't include some potential pitfalls in dealing with co-ops. First, unsavory individuals might take advantage of a farmer, making it dangerous to go into any agreement without a valid contract. Before delivering any grain to a co-op, the farmer must obtain from the co-op a written contract which specifies: price; form of payment; expected delivery date; fertilizer and other agricultural inputs; and details of the cost to the farmer. Such contracts ensure a safety net for both the farmer and the co-op. Second, a farmer should consider risk management. Although I suggest that a farmer put a large percentage of his grain into a co-op, he should also diversify, not "putting all his eggs in one basket." If the co-op as a whole underperforms, the farmer will be at a disadvantage, because

each farmer depends on the performance of the co-op as a whole to be successful.

To sum up, the positive results of co-ops are: 1) Small-scale farmers see value in crops and invest in their production; 2) access to co-ops allow for the purchase of inputs (seeds and fertilizer) cheaper than individually; 3) more small-scale farmers see value and join the co-op (leading to more agricultural production); 4) local household

income increases; 5) farmers become empowered both financially and personally in the community; and 6) co-ops provide access to markets for farmers in rural communities, which will collectively provide a comparative advantage over individual farmers in the agricultural marketplace. For small-scale farmers in many rural communities around the world, the local co-op is an essential link in the agricultural value chain.

¹For people interested in exploring the feasibility of a co-op in their area, David suggests the following. First, find out what is the major cash crop being grown in the region by small scale farmers. Second, start conversations with those farmers to see if they are interested in working together. Third, start building coalitions with buyers, sellers, and banks.

ECHOES FROM OUR NETWORK

Conservation Agriculture in Areas with High Rainfall

We recently learned of correspondence among several network members on the topic of Conservation Agriculture (CA) in areas of heavy rain. The information seemed potentially helpful for others in ECHO's network, so we are sharing it here.

Challenges with planting stations in Mozambique and request for advice

Angela Boss with World Renew shared the initial problem. She wrote, "I am here in Mozambique enjoying time with farmers along the lakeshore. Farmers here, and in Malawi, have been farming with shifting ridges for generations, resulting in a hardpan at the ground level. When the heavy rains come, the water pools and runs in between the ridges.

"Now, farmers have been taught CA and are trying out the planting stations. One of the critiques has been that, during heavy rains, the pits flood and the maize is not doing well because it is sitting in water. My guess is that the pits have not been dug deep enough to break up the hard pan, [so] the water is not infiltrating the planting station but filling up and running off. This is also the first year that the stations were dug, so the fields don't have a lot of organic matter to soak up the heavy rains. The other aspect is that some of the fields are in lowlands near the lake, so traditional practice is either ridges or planting in mounds. [The farmers] do not use fertilizer, and they are not rotating or intercropping with legumes.

"I am wondering what other advice you may have for me regarding heavy rains and CA. The other method that seems to have promise, at least for the high rainfall areas of Malawi (based on a few examples we saw at permaculture farms) was permanent raised beds rather than permanent planting stations. These raised beds/rows were

high in organic matter, had maize down the edges and beans/peanuts inside the rows, and survived the heavy rains very well.

"This is certainly an example of where CA as promoted by Farming God's Way/FFF [Foundations for Farming] may not be the most appropriate planting method, but rather they need to think about how to apply the three CA principles adapted to this specific context. Your thoughts are most welcome."

Responses

Tom Post (also with World Renew) responded with a question. "I wonder: How long are the blades of the hoes that the people are using to dig the zai holes for the CA? I also saw very short bladed hoes being used by women farmers in northern Mozambique. Those would not break the hard pan. However, long bladed hoes can be made from vehicle leaf springs. I think the 'jua kali' businesses already do this in Kenya. I have one of those long bladed hoes."

Angela replied, "The hoes here are of the short variety. And in switching from shifting ridges to CA, I imagine that it would be helpful to plow or loosen the entire field in the first year to break up the hard pan, before putting down mulch and continuing with no till after that."

Erwin Kinsey, Director of ECHO's East Africa Regional Impact Center, commented, "There is no substitute for local experimentation/innovation, and we are finding more and more that no [one] size fits all. The Zam hoes have been tested in northern Tanzania and work, but uptake is hindered by not yet mobilizing a 'jua kali' industry which depends on a high demand - not yet there... the 'chicken or the egg' dilemma. Another factor is the soil make-up. A soil high in clay would not drain well, even with no hard pan. In that case, zai pits may not be the answer; instead, smaller planting holes could be

used that are leveled after planting to avoid excessive accumulation of water, letting the mulch conserve water by dispersion rather than accumulation...my guess!

"In Karamoja [Uganda], we would welcome more thoughts on dealing with termites in the extended dry season and where mulch at best is less than 10%."

Neil Miller is a Conservation Agriculture Technical Officer for the Canadian Foodgrains Bank. He shared with the group his recent response to a similar question from someone in Malawi:

"I have seen and heard of similar issues with water logging in CA elsewhere. In most of the areas where we work, drought is much more common than excess rain, so farmers recognize that the net long-term benefit of mulching is positive. On the other hand, if a project begins CA promotion in a wet year, that [reality] may be hard for [farmers] to appreciate since they don't have enough history to know CA's benefits in a normal or dry year.

"Over time, as tillage is eliminated, soil drainage will improve as soil structure includes more pore spaces that drain excess water. However, this also takes years to develop, so farmers won't experience it as they are beginning to use CA.

"In areas with abundant rainfall and/or poorly drained soils, CA approaches need to be adapted from the standard basin planting. For example, in northern Rwanda, we are combining mulching and minimum tillage with raised beds. This way, the excess moisture is drained off during the wet periods, but the benefits of mulch are there for the dry times. Dr. Tesfay Araya's derdero use a similar approach [for growing] small grains on the vertisols of northern Ethiopia (Fig. 3). I know ridging is a common practice in Malawi. Do you know if they were combining ridging with CA in the community where this happened? If

not, they should try this. The idea is to build permanent ridges which are retained from season to season rather than rebuilt anew each year. They can either be tied ridges which completely retain water, but keep the crops high enough that they don't suffer, or ridges with 1% slope which drain excess water off to a grassed waterway. I would be

happy to supply more information if they are interested."

ECHO Florida staff, Tim Motis and Bob Hargrave, speculated that deep-rooted cover crops might also help with water infiltration in hard-pan soils. Bob Hargrave shared an online extension publication

(<http://goo.gl/8v9sYd>) with information on deep-rooted radishes as a cover crop for improving soil structure. There may well be other locally-grown crops with deep fibrous roots or a strong tap root that could be tried.

Ways to contribute to the discussion

Neil mentioned, "We have a growing discussion group on Facebook where people are debating issues like this: <https://www.facebook.com/groups/CAinAfrica/>" If you are on Facebook and would like to participate in the discussion about CA in Africa, you are welcome to join the group.

We also invite you to share your thoughts and experiences on ECHOcommunity.org. To do this, join the Conservation Agriculture forum (see <http://members.echocommunity.org/members/group.aspx?code=ConservationAg> and find/click on "Join Group" link just below the forum title) and then post a comment in the "CA in Wet Areas" topic.



Figure 3: Traditional raised structures adapted as permanent beds in conservation agriculture. Left photo (Derdero in Ethiopia; photo credit Dr. Tesfay Araya). Right photo (Imbitabo in N. Rwanda; photo credit Matthew Gates).

BOOKS, WEB SITES AND OTHER RESOURCES

Forum Presentations on ECHOcommunity

A number of symposium presentations are posted on www.ECHOcommunity.org. On the home page, click on "Education and Events" to access presentations from all ECHO forums and conferences. These contain a wealth of information relevant to small-scale agriculture. A few from two recent forums are highlighted below:

WEST AFRICA FORUM 2015

The PowerPoint presentations from the [West Africa Francophone Forum 2015](#) are in French. Even if you do not speak French, the many photos help illustrate useful concepts. The topics below also reference related English sources.

Clay Pot Cooler

"[Movement Canari-Frigo](#)" is a presentation of a simple technology, using clay pots, for preserving foods in hot, dry climates. It is a good option to consider for extending the time over which vegetables can be stored and/or sold. One clay pot is put inside a larger clay pot, with moistened sand in the space between the two pots. Water evaporates towards the outside air, cooling the inside pot. Answers.practicalaction.org has several related publications including

Clay Pot Cooler in Burkina Faso. ECHO also has an article with more details, titled *Where There is No Refrigeration* and found on page 5 of [EDN 89](#).

Post-Harvest Storage

"[Reduction PP Recolte](#)" is a presentation by N. Gouba which expands on the concept of extended storage life of perishable foods by discussing ways to minimize post-harvest grain losses. It contains numerous close-up photos of insect pests, discusses natural insect control methods and explains harvesting principles and storage structure ideas for preventing spoilage. For further reading, we suggest [Storage of Agricultural Products](#) (Agrodok 31), published by Agromisa and CTA.

PLASA (Planting without Watering)

Well-illustrated with pictures, [this](#) technique was developed (by a local Malian, Jude Théra) as a way for farmers to plant trees during the dry season, when rainfall is scarce but farmers have more time. Each tree seedling is placed on a pyramid of soil/manure inside a hole, with rocks used to fill in empty spaces around the roots and mounded above the ground. The result is that the seedlings do not require frequent watering after planting, and early root growth is directed downward towards the water table. The PLASA method is also

described in an English document, [Volunteering with Peace Corps Development Initiatives in Zana Village, Mali](#).

Sustainable Agriculture Systems (SRI and Zai)

SRI consultant, Jean Apedoh, discusses the [System of Rice Intensification](#) (SRI) as he sees it being used in Togo. Along with interesting photos of how SRI is being practiced in West Africa, there is information on mechanization of the system. ECHO wrote about SRI in [EDN 70](#), with an update in [EDN 120](#) on the System of Crop Intensification (SRI practices used in growing crops other than rice). [Asia Note 21](#) included information on SRI innovations observed by ECHO staff in Asia. Cornell University maintains a website devoted to SRI (URL: <http://sri.ciifad.cornell.edu/>).

In a talk on sustainable agriculture, "[Agriculture Durable](#)", Dr. Sawadogo presents information on several farming practices including the use of zai pits and soil bunds. The combination of zai pits (planting basins dug approximately 30 cm wide by 20 cm deep; dimensions vary according to the crop) and soil bunds (rock barriers placed along land contours) is an effective water catchment strategy that reduces rainfall runoff and soil erosion while maximizing infiltration of rainwater into the soil (Fig 4). Dr. Sawadogo's presentation

also covers composting, irrigation and other topics. For more information on zai, see [ECHO Technical Note 78](#). A link from the West Africa Forum 2015 that reads "[AgriDurable MARHASA_DGADI](#)" brings up another PowerPoint focused on irrigation.



Figure 4: Zai pits and rock bunds for water catchment. Photo courtesy of Chris Reij.

EAST AFRICA FORUM 2015

Quite a number of presentations were featured in the [East Africa Forum 2015](#). A few of these are:

Enhancing Sweet Potato Technologies

Most people are familiar with sweet potato, but may not have thought about it in the context of conservation agriculture. [This](#) presentation points out that sweet potato serves to cover the soil, can be used in crop

rotations, and is grown for both human and animal consumption.

Mitigating Banana Diseases

Based on IITA (International Institute for Tropical Agriculture) work in Burundi, various options are presented for minimizing the spread of plant diseases that impact bananas. Mulching, clean propagation methods, the use of clean tools, and disease-resistant varieties are some of the management practices discussed in [this](#) presentation. For related information, see [EDN 99](#) for the article titled *Rapid Multiplication of Banana and Plantain Plants*.

Sustainable Agriculture Systems

As in West Africa, the East Africa forum featured SRI. Additionally, the East Africa forum included a talk by Tony Rinaudo on [Farmer Managed Natural Regeneration](#) (FMNR), a system in which forest cover and productive capacity of seemingly barren land is restored by allowing and managing regrowth from still-living tree stumps. Early results in East Africa are showing that the integration of FMNR with bee-keeping has increased farmer incomes and motivation to participate. [ECHO Technical Note 65](#) contains more information on FMNR.

Conservation agriculture was featured heavily at the 2015 East Africa Forum. [Cover Crops in Conservation](#) by Neil Miller

contains information on the use of lablab (*Lablab purpureus*), pigeon pea (*Cajanus cajan*), and other beans as cover crops in parts of east and southern Africa. [Legume Intercropping Strategies](#), by Joy Longfellow, summarizes ECHO research efforts in South Africa pertaining to the intercropping of tropical legumes with maize (grown in permanent planting stations) and moringa (grown in an alley-cropping system). For those interested in exploring larger-scale applications of conservation agriculture, look for the PowerPoints on [Scaling up Conservation Agriculture in Africa](#), [Farm Power and Conservation Agriculture](#) and [Large Scale Conservation Agriculture in East Africa](#).

Sand Dams

Sand can actually hold large amounts of water while minimizing water loss to evaporation. Concrete dams, built across seasonal rivers, hold both sand and associated stores of water. The photos and diagrams in [this](#) talk complement a write-up on sand dams in [EDN 111](#).

Other topics of interest: [Newcastle Disease Control](#); [Underground Grain Storage](#); [Temperate Fruit Trees in the Tropics](#)

UPCOMING EVENTS

TAD I

Our introductory Tropical Agricultural Development course will be held on the following dates:

June 1 - 5
July 27 - 31

TAD II

Tropical Agricultural Development II, Basic Gardening for the Tropics, will be held June 22 - 26. Another TAD II course on Appropriate Technology will be held August 17-21, 2015.

Further information on these events, including links for registration, are available at www.ECHOcommunity.org.

ECHO International Ag Conference (EIAC) 2015: Poster Session Announcement

We are pleased to announce that our next annual (2015) EIAC here in Florida will feature a poster session. This will provide conference attendees with another way, in addition to a talk or workshop, to share and exchange information. If you plan to attend the EIAC in November 2015 (see www.ECHOcommunity.org for dates, registration and cost information), please consider developing a poster for display at the hotel (Crowne Plaza) venue. Your poster can then be viewed by other conference delegates at their leisure, as well as during designated times for poster presenters and other conference attendees to interact. There will also be an opportunity, during an evening session, to give a five-minute oral

summary of your poster. Poster presentations will need to be in English.

Below are links to information on how to participate in the EIAC 2015 Poster Session:

Poster Categories and Guidelines: <http://www.echocommunity.org/en/pages/eiac-poster-presentation-guidelines>

Poster Submission Form: https://echocommunity.site-ym.com/?EIAC_Poster_Form

Sample Poster: http://c.ymcdn.com/sites/members.echocommunity.org/resource/resmgr/ASIA_RIC/Veg-SEA_Poster.pdf

Sample PowerPoint for Oral Poster Presentation: <http://www.echocommunity.org/resources/a4e9f1bc-d59e-460d-96b5-8fcb4000a764>

New ECHO/MEAS Publications Underway

There is often a critical gap between knowing what could be helpful and then making that information known so that it can be put into practice. Filling that gap is the specialty of an organization called Modernizing Extension and Advisory Services (MEAS; www.meas-extension.org/). Their publications are relevant to those looking for the best ways to transfer knowledge and skills to farmers coping with various challenges. MEAS has produced a wealth of informational materials focused on best strategies, tools and resources for strengthening the role that rural extension systems play in increasing food production and farm income.

With generous support from MEAS, ECHO has undertaken a project to extract,

summarize and disseminate key MEAS insights and lessons to our growing network of field-based practitioners. As they are completed, these summaries will be posted to ECHOcommunity.org. Our first two documents, *Climate Change and the Role of Development Workers in Helping Rural Communities Adapt* and *Gender Equality in Agriculture Extension*, are now available on ECHOcommunity. We are also developing content on topics including:

- Linking smallholder farmers to markets
- Participatory methods and tools in community development
- Information and communication technologies for agriculture extension in developing countries
- Workshops in agriculture extension

For those who wish to study a particular topic in greater depth, each summary will contain a list of references to related MEAS and ECHO publications. It is our hope that these summaries will help you be more effective in communicating hunger-related options among the farmers you serve.

.

This issue is copyrighted 2015. Selected material from EDN 1-100 is featured in the book *Agricultural Options for the Poor*, available from our bookstore (www.echobooks.org) at a cost of \$19.95 plus postage. Individual issues of EDN may be downloaded from our website (www.ECHOcommunity.org) as pdf documents in English (51-127), French (91-127) and Spanish (47-127). Recent issues (101-127) can be purchased as a group from our bookstore (www.echobooks.org). Earlier issues (1-51 in English) are compiled in the book, *Amaranth to Zai Holes*, also available on our website. ECHO is a non-profit, Christian organization that helps you help the poor to grow food.

PLEASE NOTE: At ECHO we are always striving to be more effective. Do you have ideas that could help others, or have you experimented with an idea you read about in EDN? What did or did not work for you? Please let us know the results!