

Learning about and from Local Seed Systems

Summarized by Dawn Berkelaar

At ECHO's 2014 International Agriculture Conference, Dr. Laura Meitzner Yoder gave a plenary talk titled "Planting Connections: Learning from local seed systems and fostering community seed exchange

(<https://www.echocommunity.org/en/resources/89d1d849-93d2-45ae-9d61-37159a089c6d>)." The talk was based on collaborative work that was done by the following:

Rick Burnette, ECHO Asia founding director

Dr. Abram Bicksler, former ECHO Asia director

Dr. Ricky Bates, Penn State University

Dr. Tom Gill, Penn State University

Vincent Ricciardi, ECHO Asia research technician

Dr. Laura Meitzner Yoder, Wheaton College

Yongyooth Srigiofun, Maejo University.

Highlights from Dr. Meitzner Yoder's talk are summarized in this article.

 EDN143 Figure 1

Figure 1. Small lots of indigenous seeds in Southeast Asia. *Source:* ECHO Asia research team

Access to viable seed (Figure 1) is critical for successful farming. This is one reason our seed banks in Florida (USA), Thailand, and East Africa offer trial packets of seed to our network members. We have written about how to hold a seed fair (<http://edn.link/tn-80>), to enable people within a community to share and acquire seeds directly from each other. But what do we know about how seed normally flows throughout a small farming community?

Importance of smallholder agriculture for seed flow of diverse crops

Smallholder farmers make an enormous contribution to agriculture, producing and conserving biodiversity. In a recent study, Vincent Ricciardi and colleagues examined farmer surveys and census data from 55 countries. They found that farms under 2 ha produce 30-35% of the world's food, and have the greatest share of crop species diversity compared to other farm size classes (Ricciardi *et al.* 2018). On more than 500 million small farms worldwide, farmers grow food in small plots in variable ecosystems and microclimates, often close to forests and edges. Where farmers are able to periodically leave land fallow, local plant species regrow. Where the local diet includes wild foods, farmers continue the process of crop domestication when they collect and plant seeds of wild species.

Planting processes also contribute to biodiversity. Many smallholder farmers use little mechanization. Instead, they hand-sow small volumes of very diverse landraces or genetically diverse local varieties. They can be attentive to new characteristics or traits. Often, smallholder farmers save their own seed, in a labor-intensive process of selecting and harvesting seed by hand.

Importance of understanding seed flow

Understanding how seeds move through a community is incredibly important, for many reasons:

Helps with local resource assessment. You can find out, for example, what crops people are growing. This helps you learn how much genetic diversity is present, and where. Knowledge about what seeds are available can give information about the nutrition content of crops that are regularly grown and eaten.

Helps with new crop evaluation and promotion. If you want to test or introduce a new crop, you will first want to know how seeds and varieties move throughout a community, so that you can work within the already-existing system.

Enhances awareness of factors affecting change. Understanding the informal seed system can give insights into local social networks or hierarchies, internal/external changes in resources, access, marketing, etc.

Provides awareness of threats to:

Seed availability. Sometimes only one or two main people in a community save seed of a specific crop. Twenty years ago, Dr. Meitzner Yoder studied seed systems in the highlands of Honduras. She learned that in one region, while most farmers tended to save their own maize seed, they ate all their beans and then bought bean seeds at planting time. The bean seeds for a wide region were coming mostly from one man who grew a lot of beans in a distant village. In a situation like this, where few people save or distribute seed of a specific crop, the whole system would be in jeopardy if such “seed keepers” were to stop producing seed, or if they saved seeds of unreliable quality. But that same individual might be well placed to improve regional production through improved on-farm seed selection or by trying new species or varieties.

Genetic diversity. If the genetic diversity of a crop or variety is small, a disease could conceivably come through and wipe it out completely.

Seed performance. Seed that is being planted might be hybrid seed, introduced by development programs or through markets. If so, it will most likely give more and more variable results the more often seed is saved and replanted.

Helps in understanding factors affecting seed access. Finding out how seed flows through a community can give insight into the social components of access. Do all people have equal access to seed? What types of people share seed, and what social boundaries exist in seed exchange?

Provides insights into local seed saving dynamics. You can learn what criteria farmers use when they select plants from which to save seeds. These likely include “quality” factors—such as storage life, taste or palatability, and ease of cooking—in addition to yields.

Insights gleaned from research in Asia

Dr. Meitzner Yoder described a study coordinated by ECHO Asia in collaboration with Penn State University and Maejo University, done to learn about local seed systems in three indigenous village clusters in Thailand and Cambodia (12 villages in total). The team decided to investigate five aspects of seed flow within the communities, described below. Team members lived in each village for a month, interviewing households about what seeds they had and where they had gotten them.

1. **For which species did farmers save seed?** The team decided to ask about vegetable seeds in particular, but first had to figure out how to define a “vegetable” in their context. Dr. Meitzner Yoder commented that the term “vegetable” is a cultural and culinary concept; there are no universal criteria for describing whether or not a plant is a vegetable. For the purposes of the study, a vegetable was considered to be any plant used as a main ingredient in dishes served on the small round table during a typical northern Thai meal. ECHO Asia director Rick Burnette nominated a list of 210 indigenous vegetables, which the team narrowed down to 80 (50 perennials and 30 annuals; together, 30 plant families were represented). Some of the species were only semi-domesticated, and they were usually stored and planted in a mix that included up to a dozen different species.



Figure 2. Vegetable identification cards (such as the card shown on the left) were used in farmer discussions (photo on right) about seed systems in Asia. *Source:* ECHO Asia research team

2. **Sources and supply—from where did people get their seed?** To facilitate conversations with households, interviewers used an identifying card for each vegetable, showing photos of different plant parts. These cards (Figure 2) were used over and over, adapted as necessary in different locations to include photos of local varieties. The photo cards gave a common reference

point in a low literacy area with seven language groups represented. They were participatory and fun to use; they also made it easy to collect data, since each card was numbered and thus could be recorded very easily.

Participants made piles of the cards to answer questions: Have you seen this species before? Is this species present in your community? Did it used to be present? Do you save seed of this species? Do you buy seed of this species? Would you like more of this species?

In northern Thailand and Cambodia, trading small amounts of seed was common. Unlike in Honduras, this research did not indicate that there were designated "seed keepers." People did not pay for seeds, and did not expect any kind of repayment for sharing seeds. Seed sharing built relationships, and overcame ethnic conflicts; it was easier for farmers to ask farmers from other ethnicities for seed than to ask farmers from other socioeconomic classes. Buying commercial seed (most of it hybrid) was new, and many people viewed it as a marker of economic success.

Seed diversity in Cambodia was lower than in the varied microclimates and ethnicities of upland regions in Thailand, with mainly beans and pumpkins available. Farmers noted that the previous seed system in Cambodia was destroyed during the genocide, then replaced by hybrid commercial seed that development agencies introduced in the recovery period, resulting in a drastic loss of biodiversity.

3. **What was the quality of the seed?** Little data existed about the seed quality. ECHO Asia has tested many seeds' germination levels (Bicksler 2011; Gill *et al.* 2013; Lawrence *et al.* 2017). Legumes had the highest germination rates of the seeds that were tested.
4. **How were seeds processed and stored?** Participants were asked how seeds were dried (on the plant? in the sun?), how they were stored, and what kind of containers were used. Seed processing methods varied between countries. Mostly, seeds were dried on the plant or in the sun, and were stored in the kitchen.

Participants were also asked about the phases of the seed cycle, and about who (men, women, or both) was responsible for weeding, making planting decisions, harvesting and drying seeds, selling, purchasing, storing and sourcing seeds (Figure 3). The results, showing women's high level of involvement with nearly all stages of the seed cycle, were extremely surprising for some local extension workers, who asked that the exercise be repeated (the same results were found the second time). They learned to be sure to invite women when holding a training related to seeds!

5. **What were the local varieties, and what potential existed for improvement?** Interviewers asked people if they were doing any plant breeding or selection. Were farmers saving "better" fruits deliberately? Were seeds sorted before being stored (e.g. to remove small seeds, or those with holes in them)?

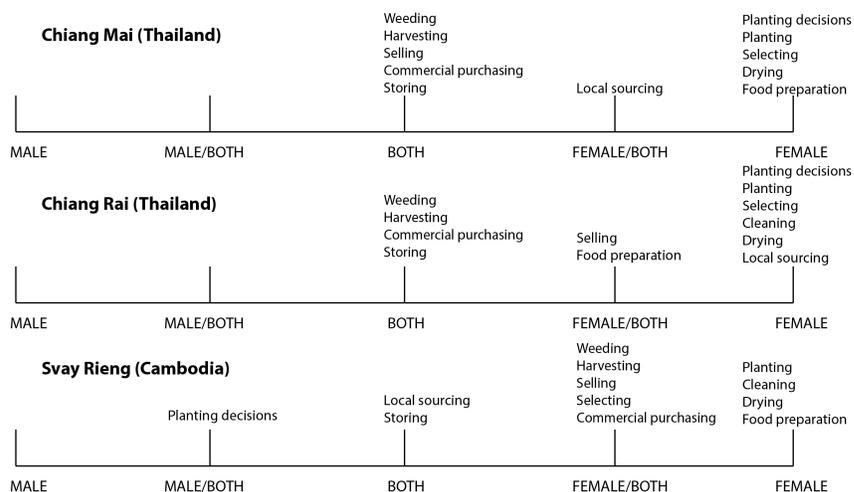


Figure 3. Gender roles in the informal seed system as identified by focus group participants in communities in Chiang Mai (Thailand) [top], Chiang Rai (Thailand) [middle], and Svay Rieng (Cambodia) [bottom]. From Gill *et al.* 2013 (content licenced as Creative Commons By 4.0).

Example of a seed fair to enhance seed flow

Dr. Meitzner Yoder concluded her talk by describing a seed fair that was held after the month of interviews, to foster community seed exchange. Families involved in the study were each given an invitation, along with ten small plastic zip top bags. Each family was invited to package and bring seeds of a vegetable that had a special characteristic. At the seed fair, each farmer was given an opportunity to discuss the seed varieties they brought, and why they liked them. The fair also included education about seed saving, and a time to answer questions about seed storage. At the end of the seed fair, participants were given time to discuss their plant varieties with each other, and to choose seed packets to take home.

Conclusion

When you understand the seed systems in a community, you can plan agriculture interventions that are sensible, purposeful, and effective. As you learn about existing seed systems, you can also help farmers understand how they can share and acquire seeds that they produce themselves or obtain from others. We hope this article helps you to do both!

Further Resources

Tshin, Ruth. 2013. How to facilitate seed exchanges during country meetings or as a single-day event (<http://edn.link/4nzwej>). *ECHO Asia Notes* 16.

Read more about the study described in this article here (<https://www.echocommunity.org/resources/1fd5c584-63f3-4cb9-bc16-cb008e6f6671>).

See TN #80 (<http://edn.link/tn-80>) for more information about planning and hosting a seed fair.

To learn more about the importance of small farms globally, check out this interactive “story map” website (<http://umn.maps.arcgis.com/apps/Cascade/index.html?appid=a48c26df4577490ba8b92d410df2e1fd>). Scroll down to view the interactive information.

References

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