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The U.S. Government's Global Hunger & Food Security Initiative



SCALING UP THE ADOPTION AND USE OF AGRICULTURAL TECHNOLOGIES

GLOBAL LEARNING AND EVIDENCE EXCHANGE (GLEE)
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Global Learning and Evidence Exchange (GLEE) Addis
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ACRONYMS

AGRA	Alliance for a Green Revolution in Africa
ATA	Agricultural Transformation Agency
BFS	Bureau of Food Security
CAADP	Comprehensive Africa Agriculture Development Programme
CBA	Cost Benefit Analysis
CGIAR	Consultative Group on International Agricultural Research
CIP	CGIAR Potato Center
CRP	CGIAR Consortium Research Program
CRS	Catholic Relief Services
GLEE	Global Learning Evidence Exchange
ILRI	International Livestock Research Institute
M&E	Monitoring and evaluation
NGO	Non-governmental organization
SSTP	Scaling Seeds and Technologies Partnership
USAID	United States Agency for International Development
USG	United States Government

Executive Summary

The United States Agency for International Development (USAID) has significantly expanded its investments in global agricultural programs since the creation of the Bureau for Food Security in 2010 to support increased investments in agriculture sector growth and leadership of the U.S. Government's (USG) Feed the Future initiative in 2010. As part of this effort, USAID has renewed its leadership within the development community and strengthened coordination with many other organizations – public, private, and community-based – with the goals of improving global agricultural productivity and nutrition.

Achieving greater agricultural development demands the innovative use of existing technologies and the adoption of new technologies – both inputs and practices – that increase land and labor productivity, use natural resources more efficiently, or enable farmers to tap markets that generate greater value and income, thus increasing the economic resilience of rural households. Ensuring that such innovations contribute to the Feed the Future goals of inclusive agricultural sector growth and improved nutritional status on a significant scale prompted USAID to hold two Global Learning Evidence Exchanges (GLEEs) on “scaling up the adoption and use of agricultural technologies.” The GLEEs were envisioned to:

- Build understanding of the current state of knowledge related to sustained, large-scale scaling up of technologies that transform agriculture and positively improve nutrition, empower women, and increase climate resilience;
- Explore proven methods, tools, and techniques to analyze potential scaling opportunities;
- Review experience-based approaches to overcome the constraints of scaling up ideas and projects and take advantage of opportunities to reach scaling targets;
- Address issues specifically related to the USAID mission context; and
- Identify the necessary next steps to enable scale-up of agricultural programs and interventions.

The Africa GLEE was held in Addis Ababa, Ethiopia on the campus of the International Livestock Research Institute (ILRI) from December 3-5, 2013. GLEE participants included nearly 100 individuals from 15 regional and country-based USAID missions in Africa as well as the Bureau for Food Security (BFS) in Washington; research centers supported by the Consultative Group on International Agricultural Research (CGIAR); U.S. universities engaged in Innovation Labs; and both for-profit and non-governmental organizations (NGOs) partnering with USAID to implement various Feed the Future programs across Africa. This diversity was intended to promote a final GLEE objective of building a learning community of practice among agricultural experts to take this work forward across USAID missions and beyond.

This report summarizes the presentations and discussions that took place in Addis Ababa. Some of the key lessons drawn from experience by presenters, discussants and participants are captured below. Four recommendations for further attention follow.

Videos, presentations, photos, and other resources from the Scaling GLEE events are available on Feed the Future's Agrilinks.org platform. Please visit the following link to access all post-event resources:

<http://agrilinks.org/events/feed-future-scaling-agricultural-technologies-gee-africa>

For additional information on scaling agricultural technologies, please visit:

<http://agrilinks.org/scaling>

Scaling Up: Lessons Learned

As lead-off speaker, Johannes Linn emphasized at the outset that an increasing number of development organizations are worrying about scaling up -- so USAID has plenty of company! Linn suggested factors underlying this emerging concern: ambitious Millennium Development Goals that require impact at a population – rather than a project – level, a challenge shared by Feed the Future; and obvious problems with design and implementation of development programs, among them: fragmentation of actors and projects engaged in development initiatives; high/rising costs of administration, especially for recipient governments; and failure to “connect the dots” and to reap the benefits of scale through learning, replication and partnership.

The “top ten” lessons of experience shared in Addis were:

Good design decisions must define the pathway from “good idea” to “impact at scale.”

There are lots of analytical tools out there. Cost-benefit analysis (CBA) may be the most broadly-useful tool for considering, *ex ante*, whether the introduction of a technology has the potential to go to scale. CBA can help to determine: whether the financial incentives for all actors are sufficient; whether the capacities of institutions involved are adequate (e.g., ability of lending institution to take risks, bankability of a cooperative); what kinds of externalities will be generated (e.g., pollution affecting downstream water users, women’s’ empowerment, reduced deforestation) and what their economic benefits/costs will be; what are the relative benefits that will be realized by different groups; and whether the array of risks likely to be encountered – climate and weather as well as macroeconomic – can be addressed.

Applying the value chain concept helps to integrate needed analyses.

A well-defined value chain should highlight all the actions, people, and institutions needed for transformation and scaling up of impact. Individual production technologies may not be unilaterally successful for farmers unless other factors – market demand, local leadership, public and private development partners – are also adding value.

“It’s all about execution; without it, we can’t get to scale.”

While we need to take a problem solving approach (i.e., identifying systemic problems and key bottlenecks, developing strategy documents that lay out the vision for solutions and the pathways to get there), it is critical that some entity be responsible for supporting implementation of those solutions, by deciding who is most well suited to perform individual tasks and providing support to those partnering organizations.

Timing, the role of the state, and market factors need to be right.

If they don’t come together, the plan for scaling up may need to be postponed, rethought, or restructured. Market opportunities are often the key driver for successful technological innovation, but a significant number of other “spaces” (or enabling factors) are essential for scaling up even when market demand is there. A good technical model (adapted to different sizes and capacities of producers) needs to be complemented by involvement of financing institutions as well as policy (and possibly infrastructure) support from the government. Business models that provide value to smallholders (and others in the value chain) are the essential complement to the effectiveness of the technology itself. Affordable financing, introduction of leasing options, partnerships with the “right kind” of people and organizations, new models for business organizations, and building up greater trust between the public sector (which sets

policy and regulates) and the private sector (trying to build the markets) are among the “spaces” that need to be addressed if markets are to define the key pathway for scaling up impact for both producers and consumers.

Data availability remains a constraint to developing effective plans for scaling up.

In particular, accurate data on culturally-important variables are often missing when a CBA is conducted. Quantitative information on women’s roles as producers, their responsibilities for both production and household nutrition, and their access to returns from production is often hard to find. The Women’s Empowerment in Agriculture Index (WEAI) tool may be helpful here. There is additional value in trying to pull such quantitative data together as it increases involvement with partners or potential partners. The value of engaging experts in different fields – and tapping into the tools they use – can also support the analysis and decision-making process.

Special approaches may be called for when family food availability (rather than markets) is anticipated to be the key driver for innovation and technology adoption.

Doubling the value of interventions (e.g., by using demonstration plots as certified seed production sites) and introducing new innovations over time (i.e., as the scale of technology use and impact grows) are among the strategies used. Production of a crop that is similar to, but more nutritious than, a traditional crop may not be difficult, but persuading farmers that switching varieties will improve the nutrition of their children takes additional education and a modified input value chain to make it happen. Non-market innovations may need to be more location-specific, more gender-aware, and more gradually introduced to match the expansion of interests and capacities.

Capacity development is important.

Every innovation requires that new information be shared; many innovations require different skills as well as a change of mindset or approach. Scaling up implies that these new capacities will be acquired by large numbers of people, so scaling up requires a long-term perspective, often at odds with the availability of short-term project resources. Partnerships are an important way to strengthen capacity in the short-term. Public resources need to be positioned effectively; private sector resources and know-how are strategic inputs.

New approaches to scale up awareness and interest of potential actors in the innovation process are emerging fast.

Although there is still a role for public extension services, use of ICT tools and distance learning methods are being actively explored as a means for cost-effectively scaling up the dissemination of information to thousands of farmers. Enabling farmers to self-test potential technologies that they think might fit into their production systems is another approach that works well when the menu of technologies offered is suited to their geographic zones. Organizational innovations that foster farmers learning from each other can also accelerate the innovation process. Underlying themes include the importance of: taking a systems approach; recognizing farmers’ preferences and choices, i.e., “real needs”; connecting research and extension to build feedback loops; and bringing in non-conventional partners.

Successful policies can leverage change.

Prioritization of research on crops important to smallholder farmers can lead to significantly greater numbers of such farmers benefiting in visible ways (a political criterion). Policies on trade, foreign investment, and private business operations can maximize the impact of scarce government resources (an efficiency criterion) and also focus the use of private sector resources (bringing in valuable know-how, additional finance) for sustainable innovation. Formulating policies to drive the scaling-up process is one thing; implementing them effectively is another. Details are important. Poorly-designed fertilizer

subsidy policies, for example, can lead to higher prices for poorer farmers. Inappropriate tax policies can disadvantage local producers and favor imports. Further, scaling up initiatives often encounter the classic public policy problem: how to realize the potential to achieve a large impact at the societal level with an intervention that generates a relatively small benefit to each individual farmer or agent in the value chain.

Tracking progress along the scaling-up pathway is key.

Monitoring and evaluation of activities intended to result in impact at scale is critical to ensuring that actions are still on the selected pathway (i.e., drivers are continuing to push in the right direction, obstacles both anticipated and unforeseen are being cleared, and the vision of results is attainable) and that those involved are accountable for their commitments. While Feed the Future has established a shared results framework for all programs, “custom” indicators may be needed for monitoring specific programs, facilitating learning while doing (e.g., are women being reached, are trade-offs being managed), and assessing impact in a specific geography. At the same time, several issues associated with M&E must be addressed: “baseline survey” fatigue; data availability and reliability; overlap of interventions muddying attribution of results; time needed to achieve impact; measuring spillover effects and unintended consequences; and development of indicators tuned to partners’ interests.

Recommendations

Spend the time necessary to do effective *ex ante* analyses before finalizing a plan for scaling up.

These analyses will help to: understand the institutions essential to making progress along the pathway selected; assess the costs and benefits of proposed approach; identify gender-related issues; and determine the potential for scaling up to population levels (perhaps through partnership with others, major policy change, or use of better geographic targeting). Consultations with stakeholders will help to define “the problem” more clearly and may lead to solution sets that leverage the individual interests of diverse stakeholders while contributing to systemic transformation. Thinking outside the box may identify new opportunities for intervention. Analysis will also help to address the common dilemma of trying to achieve multiple objectives in a single project or program.

Pay attention to the “elephant in the room,” that is, that the context for scaling up the adoption and use of new agricultural technologies involves integrating informal farm-based operations into formal institutions.

This means, for example, that formal markets for inputs and commodities need to be competitive, reliable, and efficient – and open and fair to informal smallholder farmers. Lending institutions need to provide short- and long-term financial services – and have the confidence that small farmers as borrowers will repay. Farm-based organizations, with independent smallholder farmers as members, need to be able to enter into legal contractual relationships for services and sales – and to ensure that those contracts are respected.

Partnerships are essential to scaling up the adoption and use of technologies – and sustaining the process of innovation over time.

The value chain concept helps to identify the range of partnerships that are critical, but there are many barriers to effective partnership – lack of trust, use of different languages, different interests, and different metrics. Finding the “right partners” is worth the effort. Who are they? Those who add value with special knowledge, are familiar with the area, have long-term relationships already in place. Those who can help to reduce risks, support innovation, clearly understand the strategy and are committed to action.

Women as well as men. Business owners as well as civil servants. “People are people; when they get together, they get energized.”

Take the long view.

Scaling up is rarely accomplished with one project or the introduction of one technology. A second project may be necessary to continue to expand services in a geographic area, and a third to replicate it in a similar, neighboring area. A fourth may be needed to develop the optimal bundle of technologies. A number of initiatives may be needed to accomplish vertical scaling up; they include mainstreaming the approach through policy, legal, or institutional reforms. And, as with any innovation process, new opportunities and new obstacles will emerge. Ways to engage in different functional areas – mobile banking, construction of fertilizer blending plants, strengthening of farmer-based organizations -- may need to be found.

I. OBJECTIVES OF THE GLEE

The United States Agency for International Development (USAID) has significantly expanded its investments in global agricultural programs since the creation of the USG Feed The Future initiative in 2010. According to the L’Aquila Pledge Tracker, total obligations for FTF globally were nearly \$4 billion as of December 31, 2012, with USAID responsible for \$2.5 billion of that amount. As part of this effort, USAID has renewed its leadership within the development community and aligned itself with many other organizations – public, private, and community-based – with the goal of boosting agricultural productivity and improving nutrition world-wide.

Achieving greater agricultural development demands the innovative use of existing technologies and the adoption of new technologies – both inputs and practices – that increase land and labor productivity, use natural resources more efficiently, or enable farmers to tap markets that generate greater value and income, thus increasing the economic resilience of rural households. Ensuring that such innovations contribute to the Feed the Future goals of inclusive agricultural sector growth and improved nutritional status on a significant scale prompted USAID to hold two Global Learning Evidence Exchanges (GLEEs) on “scaling up the adoption and use of agricultural technologies.” The GLEEs were envisioned to:

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In this spirit, this report summarizes the presentations and discussions that took place in Addis Ababa in an order that reflects the structure of the GLEE agenda. It will remind participants of some of the key points shared in fast-moving presentations and discussions.

II. DAY ONE – WHAT IS “SCALING UP?”

The first day of the GLEE was designed to explore what “scaling up” is all about, why it is a priority for USAID in its agriculture and food security programming, what is involved, how we can recognize opportunities for scaling up efforts and impact, and what needs to be considered while gathering evidence of what works and how it might be replicated or extended elsewhere. The day was structured around short presentations, generally followed by interactive group discussion.

Why this GLEE?

Julie Howard, Chief Scientist in the Bureau of Food Security, outlined the rationale and objectives for the GLEE in her opening remarks. “We have seen a return to agriculture over the past decade, with increased involvement of both the public and private sectors, within countries and at a global scale. It is important that we are holding this first GLEE on scaling up the adoption and use of agricultural technologies in Addis Ababa, the seat of the African Union. The 2003 Maputo Declaration first signaled the resurgence of commitments to agriculture as African heads of state pledged their political commitment to increasing agricultural growth to six percent per year and public investments in agriculture to 10% of their annual public budgets. This Declaration set the stage for Feed the Future to be a different kind of initiative, recognizing agriculture as a key engine of economic growth. We are supporting country-owned priorities, a watershed for USAID, as we align mission programs with country investment plans. Feed the Future consistently refers back to the Maputo commitments and is, by working within the Comprehensive Africa Agriculture Development Programme (CAADP) framework, a direct descendant of those commitments.



We all expect that this growth will be: broad-based, including smallholder farmers, women farmers as well as men; focused on improving nutrition as well as yields of crops in the field; and all the while shrinking the environmental footprint of agriculture. USAID has taken the leadership in implementing Feed the Future as a whole-of-government effort. We are doing business differently in other ways as well, collaborating with other donor-partners and the private sector. We are not considering only where and how we can invest USAID resources but also addressing the challenge of getting others' resources to join. These new approaches, however, are built on ways that USAID has operated for a long time, but they are more focused, involving fewer value chains, and concentrated in specific areas or 'zones of influence'.

In Feed the Future, USAID has embraced the idea of working in value chains, a concept that gained currency a decade or more ago. We understand the importance of innovating throughout the value chains: use of improved seeds, fertilizer; building markets; addressing consumer preferences; reducing costs so that food is more affordable and producers make a better profit on their sales. With Feed the Future now in its fourth year of implementation, we are beginning to see some impacts of this value chain focus. Our Progress Report documents some of the key statistics on farmers realizing increased yields on an expanding number of hectares -- but we are still largely seeing impacts at project level. It is not clear that we are on a track to achieve the larger, population-level, impacts that we are aiming for.

So that is the underlying challenge of this GLEE: what do we need to do to get there in the way of innovations and new technologies, how can we harvest our experience to learn what will work more effectively, how do we frame alternatives and opportunities, and what should we do to focus our effects for impact? What constraints must we address? Which are tractable and which are not? Can we move away from simply working away at a laundry list of constraints and to building focused partnerships that will facilitate solutions? How do we know what a feasible population-level impact looks like? How can we assess our progress toward that goal? How do we assess impact on poverty and nutrition?

The draft scaling plans that missions were asked to prepare in advance of GLEE will provide a great base for discussions here in Addis and over the next few weeks. Some are focused on a single technology, while others have identified whole systems of technologies and combined them with institutional innovations. These draft scaling plans have done what we wanted: enabled us to focus on proximate opportunities and raised important questions. Some of these questions we anticipate addressing with the expert help we have invited to join in this GLEE. We hope to work in a purposeful way, joining experts' advice with the evidence and experiences of Washington colleagues, development partners, and others.

If successful, we can create a community of practice around scaling so that when roadblocks are encountered and new questions arise, we can reach out to others for input.

We realize that there may be no single blueprint for scaling up the adoption and use of agricultural technologies, but we now have some ideas moving forward and we hope that, by the close of this GLEE, we will have many more.”

What Do We Know From Experience?

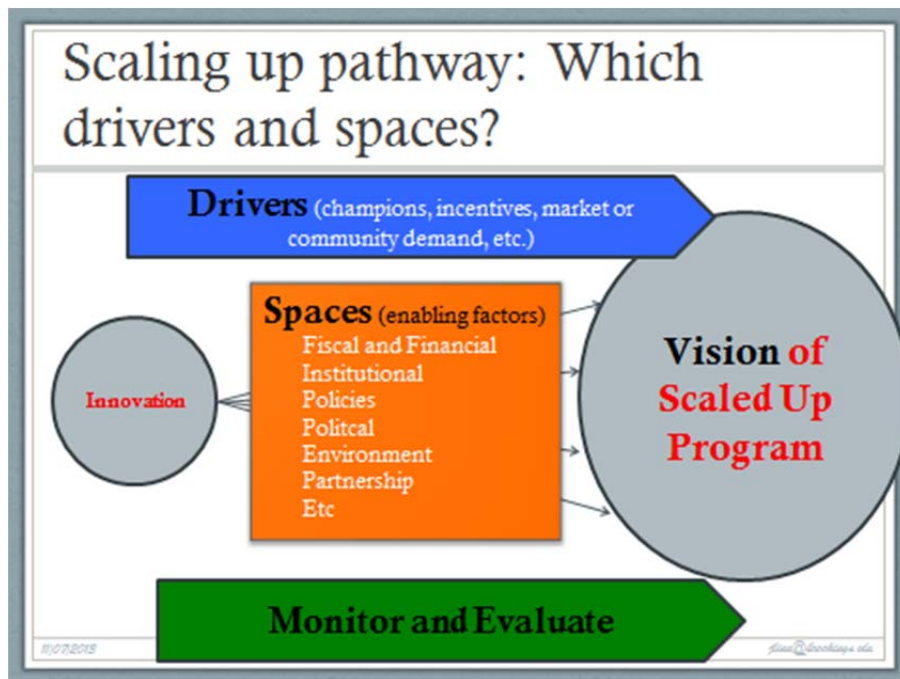
Johannes Linn of the Brookings Institution led off



by sharing the results of several years of analytical and consulting work on scaling up development initiatives for sustained impact. He first noted that the process of “scaling up” development interventions can take different forms (box). He then presented a framework for analysis of the scaling process and a language for discussing scaling up that proved to be useful throughout the GLEE. Starting with the vision or core ideas for scaling up, Linn outlined the roles that drivers, pathways, and spaces (or enabling conditions) play in successfully achieving that vision and anticipated impacts at scale.

TYPES OF SCALING UP

- Expansion of services to more people in a given geographical area (fill-in)
- Horizontal replication, from one geographic area to another (including across borders, i.e. South-South cooperation)
- Vertical scaling-up (policy, legal, institutional reform for mainstreaming an approach)
- Functional expansion, by adding additional functional areas of engagement



Johannes Linn offered several words of advice for donors:

- Support (don't hinder) scaling up
- Move from a project-by-project to a programmatic/scaling-up approach

- Plan for the long-term, watch continuity, stick with it; but prepare for eventual hand-off
- Develop potential pathways early on and take proactive steps to plan and prepare for scaling up (go beyond “exit strategies”)
- Explore especially the institutional, policy, fiscal, learning and partnership spaces that allow scaling up
- Keep it simple

Khalid Bomba, CEO of Ethiopia’s Agricultural Transformation Agency (ATA), provided insight both on the ongoing challenges and some early successes that the Agency has experienced in its efforts to catalyze the efforts of a wide variety of public sector organizations and development partners for greater impact in agricultural production. Bomba cited four key elements of the ATA approach: problem solving through consultations with partners; implementing actions to support solutions; coordinating with a diverse set of partners; and building capacity of others to continue the process as ATA is a time-bound organization.



Luis Pereira, from TechnoServe Mozambique, presented a benchmark case describing several years of effort to introduce profitable soybean production in Mozambique. Market demand for soybeans as animal feed is growing significantly, he said, and both smallholders and larger mechanized farmers can meet that demand through profitable farming operations. An earlier attempt suffered from bad timing (a war was on) and followed the wrong model for growth, with too much involvement of state farms. Now, donor support, financing from local banks and good farmgate prices are enabling a diverse group of private farmers to aim at doubling production in the coming years.



Regi George then shared the eight-year experience of Olam, an international agribusiness firm.

Working with the USAID-supported

(MARKETS) project in Nigeria, Olam at first sought to link smallholder farmers with a refurbished (formerly public sector) processing plant with the goal of supplying high-quality milled rice into a robust Nigerian consumer market. After five years, however, Olam’s business goals were not being met, so a different pathway was chosen. The company’s revised plans involved scaling-up their processing business with a newly-constructed and more efficient plant based principally on the production of a company-managed large-scale irrigated farm. This has led Olam into a significant private investment involving Greenfield development of both production and processing operations and the potential for additional scaling up as a strictly commercial enterprise.

How Do We Strengthen Our Ability to Scale Up Agricultural Technologies?

GLEE participants were then invited to consider what is involved with starting the process of scaling up technologies successfully. How might one gather and analyze evidence, build on experience and relationships, and define feasible pathways forward?

Cost-Benefit Analysis

Dan Swift, economist at USAID/Ethiopia, led off this session with a short presentation on cost-benefit analysis (CBA) as a useful tool for conducting an *ex ante* assessment of whether or not a specific set of interventions would be likely to have the impacts sought. He described four analyses that underpin the

cost-benefit analysis (financial, economic, beneficiary, and risk) and concluded that, in spite of the time and effort it takes to do a good cost-benefit analysis, its value lays in forcing you to consider important questions systematically and trying to calculate key variables.

- CBA is an important tool to support program design.
- Rigor must be applied, especially when considering how to integrate externalities, which can be difficult to capture.
- Externalities from a smallholder farmer perspective can include inflows, like seeds, and outflows, like wholesale purchase price.
- Institutional analysis, economic analysis, and incentives must also be considered.
- CBA can be disaggregated by different groups; risk analyses, for example, can vary depending on individual and can have a clear link to M&E.
- Evidence can move policy; it is important when using CBA to design programs to focus on maximizing positive externalities.
- Strong policy is needed to support lasting results and sustainable solutions.
- When using CBA to take program design to scale, consider cost control in criteria for proposal process.
- It is important also to consider a systems approach and cultural context.
- Example of gender integration/women farmers was discussed; information often is inadequate since women often provide labor but have less control over and access to income.
- It is important to consider that CBA is just one tool of many that can be adopted to address program design needs and social impact.
- More internal capacity building is needed to support successful implementation of CBAs.

Other Approaches and Issues

Three panel members brought other perspectives to the discussion:

Kathy Colverson, ILRI's gender specialist, emphasized taking gender into account. Even though data are often missing, cultural context is important and some tools, e.g., the Women's Empowerment in Agriculture Index or perhaps a beneficiary analysis conducted as part of a CBA should be used to address this context.

Maria Andrade, a scientist at the CGIAR International Potato Center (CIP) with long experience in introducing high pro-vitamin A orange-fleshed sweet potatoes to Africa's children, explained how this project has focused on achieving nutrition outcomes through the production of a new agricultural commodity.

Andy Levin, drawing on his prior experience in USAID/Zambia, shared the approach used by COMACO, a non-profit in Zambia that combines a focus on environmental conservation with actions to promote food security through commercial agriculture. He noted the importance of including positive environmental impacts in the project design.





Opportunities for small-group discussions and individual reflections enabled GLEE participants to share their own experiences and hear other perspectives throughout the day. The day concluded with a highly-interactive event. Several people were invited, using a “bus stop” format, to share useful analytical and assessment tools that could support the design of plans or pathways for scaling up.

Takeaways Regarding “What is Scaling Up?”

As Johannes Linn described it, scaling is a long-term process aimed at population-level impact, best approached by articulating a vision and defining an explicit pathway of actions, to be carried out by a range of people and institutions that will achieve that vision. Many participants found this definition to be useful and the language of “drivers” and “spaces” as well as pathways and visions proved helpful.

- Discussion of project examples and understanding how they worked out issues of feasibility is valuable; information sharing is critical. More evidence of what has already worked – and why – is always useful.
- In making scaling plans, good analysis is crucial. It is clear that there are many different analytical and planning tools available and needed. Some participants found that the need to address trade-offs posed difficulties: for example, how to maximize impacts on gender and the environment as well as productivity or profits? Through the bus stops as well as from panel presentations, it was evident that there were tools to address those questions and many others: how to target geo-spatially, how to define win-win solutions, how to build partnerships? But the constraint of time to do these analyses – and to bring in the right skills and data – was clearly posed.
- There was expanded recognition of the need to engage partners, especially from the private sector, in scaling. Coordination among partners can be challenging, however, because it takes good communication skills, a shared vision, and incentives for all partners to work toward the vision.
- We need to ask ourselves what success looks like, remind ourselves of this, and capture successes while also sharing lessons. Is the integration of the poorest farmers an important element of success for Feed The Future?
- There is a definite need to develop capacity to support this long-term vision to achieve results – not just at project level, but at a population level.

III. DAY TWO – HOW DO WE SCALE UP?

On the second day, GLEE participants turned to issues of implementation: how to create or tend to the enabling environments (or “spaces”) that are needed to support scaling-up efforts; how to engage with stakeholders to share the knowledge and skills necessary to support use of new technologies, especially when they involve significant changes in habits and behaviors; what models and approaches for involving private sector partners and investors are likely to be effective; and, finally, what are the roles of

government policies in supporting scaling up and how might USAID engage to change policies to better promote expanded use of key technologies. These challenges were addressed in three “theme” sessions. At the end of the day, 20 or so representatives of the many research and development organizations working in Ethiopia joined the GLEE participants to share their insights and experiences in an Agricultural Technology Marketplace.

The theme of partnership, highlighted again and again on Day One, was woven throughout the discussions on the second day of the GLEE.

Theme I: Changing Farmers’ Behaviors

The “extension” challenge – **changing farmers’ behaviors** with new knowledge, training, or other skills development -- was creatively addressed by a panel of experts.

Brent Simpson of Michigan State University (and USAID’s Monitoring Extension and Advisory Services, or MEAS, project) led off with a review of the history of new technologies getting out into the landscape (a multiyear process with innovators and early adopters leading the way, followed by the early majority, late majority and laggards) and the adoption process (started by awareness, leading to interest, then followed by evaluation, trials/adaptation and adoption). He drew attention to a number of lessons of experience: a variety of ways to provide new information and skills, chronic underinvestment in this process, and the importance of learning to the process of scaling. He echoed Julie Howard in concluding that there was no one best way, but, rather, a number of options.



Key Questions

- How do we *define* scale when thinking about the adoption of agricultural technologies and practices?
- How do we *design* for the potential of scaling the up-take of agricultural innovations?
- How do we *sustain* the momentum of scaling behavior change once it is initiated?



Vinay Kumar suggested, however, that the new approaches introduced by Digital Green -- using videos and impact-tracking on Facebook – are showing promise of being highly effective (and significantly more cost-effective than traditional extension methods) in scaling up use of new agricultural technologies. There are three components in the Digital Green model: (1) Partner with local NGOs or government agencies that have expertise in the subject area. (2) Identify 4-5 people for training in video production, going from topic identification, story boarding, shooting and editing 8-10 minute videos. (3) Disseminate the videos among the population, with farmers and subject matter specialists providing the “human mediation” to get the information out. Recently, a new Facebook platform – Farmerbook –has been developed to enable tracking of what farmers have seen, liked, and used. This tracking system is called

COCO, “Connect Online - Connect Offline.” The data is fed in to the system in an offline mode and then connected to the server, putting it online and making it available in real time.

David Wanjau of Farm Input Promotions (FIP) Africa Ltd. added his group’s experience with another approach – that of introducing many improved input technologies to whole villages of people for their own “on farm” trials. While the trial amounts are very small, they are sufficient to demonstrate potential. FIP then provides farmers the option to purchase those inputs from village-based agents when they are satisfied with the results.

Margaret Mwenya, of Catholic Relief Services (CRS) Zambia, shared the “5 skills” model that CRS is using to guide its work with farmers who are vulnerable-but-viable and entrepreneurial-and-thriving. The five skills are: innovation, financial management, natural resource management, marketing and group organization. Methods for building these skills are evolving, with a new distance learning tool (Go Course) showing some promise for scaling up.

Rob Bertram, from USAID/BFS, commented on the session: “The long time lag is humbling, but we can see that pluralistic extension approaches are really becoming reality.” Further, he stressed, it is important to recognize that, while state extension systems are still important, NGO partners are clearly adding value as they work with farmers – including poor farmers – to connect all farmers to research outputs and to markets. GLEE participants, when “buzzed” by facilitator Peter Ballantyne, offered their own reflections on the session. Among them:



- Keep the approach simple, but recognize that systems are important
- Involving farmers in the solutions enables information to be crowd-sourced – as in the Digital Green initiative – and boosts farmer familiarity with new technologies.
- Low-risk introductions of new technologies – as FIP Africa does – enable farmers to make their own choices. The approach demonstrates the importance of having something to offer! But it also provides an example of “going to scale” by “going deep,” i.e., touching all the people in a village.
- Coordination of partners as well as coordination of messages in one geographical space might have greater impact.
- There is need for farmer motivation so we have to focus on real needs.

Theme 2: Involving Private Sector Partners and Investors

Engagement of the private sector and the ability to tap into commercial approaches was the next theme on the agenda for implementation of scaling up plans.



Bob Rabatsky of Fintrac described his learning from managing the USAID-supported Partnering for Innovation project: first, have an innovative technology, and second, have a business proposition for getting the innovation out to buyers. He illustrated this with several cases. One involved a company in New Jersey building off their US experience to provide test kits for veterinary and human health scientists. The company devised a low-cost test kit for mastitis in Rwandan dairy herds. The “Udder Check” technology was innovative and effective in signaling the need for treatment before milk quality was affected, but getting the test kit operational in the field required project support from USAID and partnering with a private vet services company based in Kenya as well as milk collection centers in Rwanda.

Aline O’Connor of

AgriExperience emphasized the role of finance in enabling private companies to scale up their operations. She noted that, often, priority was given in Africa to farmer credit when it is really the agrodealers and seed supply companies that need financing first. Africa now has several “decent sized” seed companies, but the sector needs to grow if farmers are to use improved technologies (seeds!) at scale. Further, she emphasized the importance of paying attention to costs of borrowing which, in Africa, tend to be too high for profitable operations. Blending the local knowledge of local

financial institutions with the capital of external sources can be a way forward, she suggested, so long as the outside capital is not “vulture” venture capital.

Worede Woldemariam of Dupont Pioneer emphasized working in partnership so that the core competence of one’s own firm would be complemented by the skills and competencies of others. Provision of improved seed pays off when farmers have the ability to use those inputs effectively, markets are robust enough not to collapse when everyone experiences a good year, and complementary inputs (such as leased tractors) enable successful farmers to scale up.

Kinyua M’mbijjewe of Syngenta East Africa noted that, as a partner in the New Alliance for Food Security and Nutrition, his company had set a goal of scaling up its business in Sub-Saharan Africa to \$500 million over the next 10 years. Getting there, he said, would not be easy as it would require training, partnerships with the “right kinds” of partners (that is, who can add value, special knowledge, area familiarity, and are willing to build long-term relationships), an ability to reduce risks (e.g., through micro-insurance), and a new organizational model that emphasizes a responsibility for innovation, out-of-the-box thinking, and the development of new supply chains. Syngenta, he noted, is focusing on smallholder commercial farmers and “emergent” commercial farmers – not the vulnerable. Further, he underscored learning from earlier partnerships: that they take time for people to get to know each other, governments do not naturally trust industry, donor expectations need to be addressed as the private sector is not like NGOs, and there has to be a way to deal with disputes as they emerge.

A BRIEF QUESTION AND ANSWER SESSION

Question: What are other tools USAID can use to help meet seed enterprises’ needs? Is there a risk of keeping winners if interest rates would have to be subsidized?

Aline O’Connor: We would like to see a 7-11% range in interest. If seed enterprises do not have access to capital and are not part of the market, quality of the seeds goes down, and local farmers are abandoned. Not having capital is really disruptive. Potential option would be a warehouse space leasing and working with counter cyclical businesses that can provide space. Grant funding is a great incentive and lending vehicles for use is important to consider as well.

Question: Pioneering leasing guarantee. Outside equity doesn’t work well, that concerns me since there are a lot of donors and partners with funds. Why are they not responding well, what can they do differently?

Aline O’Connor: Biggest questions are about equity. The sense is that the equity model is not fit for Africa, business is about family. Businesses in Africa do not want to give a part of their business to strangers. It’s more risky for the farmer: time works against them.

Chris Ryder, of USAID's General Counsel's Office, tied up the session by describing a number of partnership options that USAID missions can use to engage the private sector: grants and programs such as the Partnering for Innovation project; the Development Credit Account that enables USAID to share risk with private financial institutions and facilitate their entry into new markets; the Global Development Alliance that supports public-private partnerships; and various approaches that facilitate the provision of technical assistance and training to local businesses. A lively Q&A wrapped up this session.

Theme 3: Policy

Seed and fertilizer policies were highlighted as critical areas for attention as they are so fundamental to increasing agricultural productivity and scaling up impacts.

Duncan Boughton of the Michigan State University Food Security Group led off by reviewing why poor policies limit the possibilities for scaling up agricultural technology adoption and use: they can drive up input costs, reduce supplies of inputs, and affect profitability. By contrast, he noted, it is possible to say what good policies are: Successful policies lead ultimately significantly greater numbers of smallholder farmers benefiting in visible ways from access to and use of high quality seed and fertilizer in ways that maximize the impact of scarce government resources and that maximize the use of the private sector for purposes of sustainability, innovation, and saving government resources. Policy analysis is needed to identify constraints and to determine which policy instruments are appropriate for different policy objectives. It is not possible, for example, to minimize the cost of access to inputs for the poorest producers by fixing prices below-market value and, at the same time, to expect that businesses will be able to operate profitably.

Group discussions surfaced other issues with regard to seed policies:

- Seed diversification problems: Root crops are rarely mentioned in discussions of seed policies, but, given their importance as staple crops, we need to think of a strategy for those crops.
- In many places, the seed certification system does not work: no budget, no staff, and no time. There has to be a collective voice on certification. One might also question certification as part of a monopoly policy on the part of government. It might be important to quantify what the impacts of inadequate certification policies are in order to demonstrate the numbers to the decision makers or satisfying some other constituency. What is the cost of having an institutional system like this? While experience in east and southern Africa shows that a regulatory agency may be critical to assure farmers that what they're purchasing is a good thing, that agency should also provide information on the yields the seeds will produce. However, in reality, a quality assurance system is time-consuming and expensive (as it involves packaging inspection, etc.).
- Different standards need to be available for different crops.
- The lack of institutional capacity to implement policy is bothersome. How do we learn from other examples? How can we show visibly that with a good policy we can make a difference and change the landscape?
- Ghana is at a point where they will legalize the seed and policy regulation.
- Harmonization of policies and regulations. This could result in releasing seeds in a few countries. There is limited capacity for seed production and this could make that capacity reach more customers.
- The role of the public sector in providing seeds should be clarified in policy and take into account the institutional capacities of public organizations involved (e.g., research organizations providing breeder seed, seed agencies producing foundation seed, etc.). Policies must be smart and focused on what will best serve the farmer. If public institutions cannot provide what farmers need, then other options (e.g., private systems) need to be considered. Otherwise, farmers will look for different sources of seeds and the quality will be at risk

Some recommendations for implementable actions include but are not limited to¹:

- Accelerate the availability of new varieties streamlining varietal testing could prove to be effective by reducing the amount of years, sites, even the criteria for testing.
- Make government certification optional.
- Relax international trade restrictions.
- Informal seed producers should be supported by the seed sector. They can be strengthened by cooperatives and local communities – farmers can be identified for multiplying seeds, then seed fairs can be established in order to sell and exchange different varieties.
- Seed certification agencies should be “independent of seed producing enterprises.”² This could avoid certification of low-quality seed being produced by a government enterprise.
- Government should focus on establishing a seed information system which could provide forecasts and estimates of demand and prices and provide farmers’ feedback among other resources.

IV. DAY THREE – MONITORING & EVALUATION, LEARNING, AND SUCCEEDING IN SCALING UP THROUGH VALUE CHAINS

The final day of the GLEE addressed the importance (and difficulties!) of learning through effective monitoring and Evaluation and the potential for integrating actions aimed at scaling up the adoption and use of agricultural technologies by facilitating more farmers’ participation in expanding value chains. Given participants’ greater appreciation of the need to plan for sequential actions to be carried out along a selected pathway over a long period of time, the challenge common to both themes was that of defining metrics that (i) enable accurate tracking of the effectiveness of interventions and (ii) suggest necessary adjustments for program success. Given the importance of value chains in USAID’s country strategies, presenters and panelists fielded a lot of questions:

How were the necessary actors engaged all along the value chain?

What was the consumer market response?

Who were the most important drivers (individuals or organizations) in the value chain initiative?

Which of the drivers (people, incentives, institutions) proved to be most critical in strengthening the value chain, and specifically promoting the scaling up of new technology adoption and use in various segments of the chain?

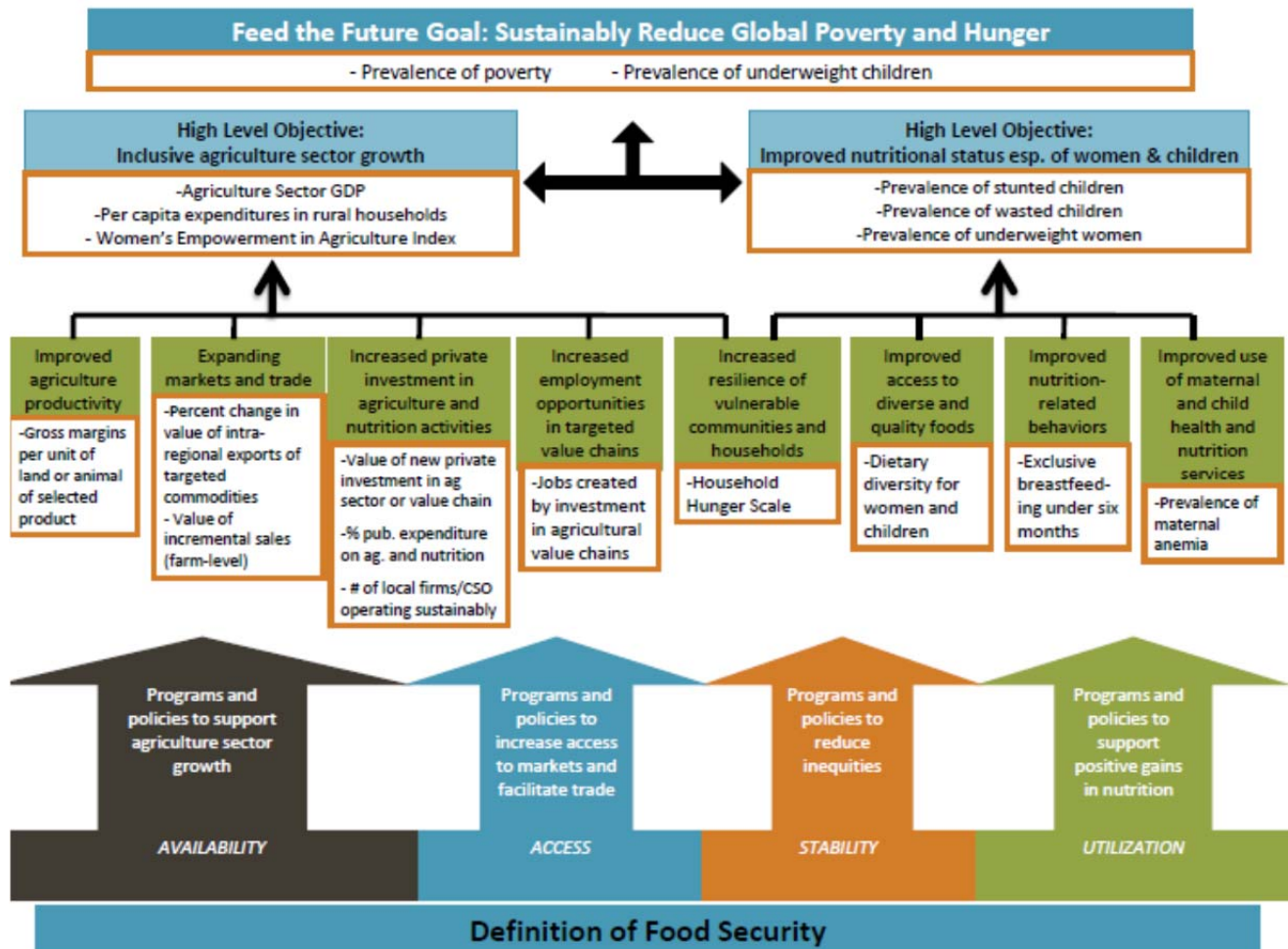
Theme I: Learning Through Monitoring & Evaluation

Emily Hogue, USAID/BFS, joined the GLEE by phone. She shared her thoughts on priorities for monitoring and evaluation (M&E) within the context of Feed the Future. The conceptual framework for Feed the Future lays the groundwork for all M&E, but the priorities we are trying to emphasize in carrying out the M&E work are: efficiency (standardization of indicators and alignment to permit them to tell a consistent story), accuracy (ensuring scientific rigor and precision) and sustainability (data quality

¹ Technical Convening on Seed and Fertilizer Policy in Africa, Addis Ethiopia Dec 5-7, 2013
http://agrilinks.org/sites/default/files/resource/files/Document_4_Summary_of_Presentations_0.pdf

² Ibid p. 4

and the capacity of donors and partners at both institutional and individual levels to be able to continue the efforts over time). The Feed the Future learning agenda is also important as it poses a set of questions that Feed the Future aims to answer through the M&E process. These questions address agricultural productivity, agricultural research and development, markets and trade, nutrition and dietary diversity, gender and women’s empowerment, and the resilience of vulnerable populations.



Suzanne Nelson of TANGO, a consulting group supporting USAID/BFS on M&E, deepened the discussion on M&E by reflecting on efforts to develop a handbook to achieve the standardization and alignment that Emily mentioned. She illustrated the difficulties encountered in defining farmers, direct and indirect beneficiaries, “first time” users of new technologies, technology packages, and other concepts. She noted the challenges of attribution and taking into account indirect beneficiaries, spread effects and zone-level results. The elements of the learning agenda related to scaling up agricultural technology adoption and use, however, were more clear and highly relevant to the GLEE discussions: what are the most binding constraints in promoting technology adoption and the most effective interventions for dealing with these constraints; what are the characteristics of effective, efficient, and sustainable vehicles for promoting adoption – especially by women, the poor, and the socially-marginalized; what have been the gender impacts of specific technologies; and what trade-offs have resulted from the increased use of a specific technology, e.g., with regard to labor allocations. She also noted some upcoming impact evaluations that are expected to address this agenda: of urea deep placement in Liberia, e-verification and effective marketing of agricultural inputs in Uganda, mobile money and farmer savings in Mozambique. Finally, Suzanne noted that scaling plans developed by missions may

need new M&E plans, custom indicators or other elements to be useful. She recommended that GLEE participants could get additional information on M&E relevant to Feed the Future by checking out: <http://agrilinks.org/library/feed-the-future-ag-indicators-guide>

Mulemia Maina, of the Alliance for a Green Revolution in Africa (AGRA), drew on her experience as a grants manager to suggest how the USAID-funded Scaling Seeds and Technologies Partnership (SSTP) activity being implemented by AGRA will tackle the challenge of M&E. She emphasized the centrality of M&E in the project cycle and AGRA’s interest in monitoring both for accountability and results using a number of different tools: standardized data collection, indicators suited to specific activities, and a quarterly dashboard that permits tracking of outputs. Already, she noted, SSTP/AGRA has encountered some new challenges: farmers are not eager to participate in yet another baseline study, available data is spotty and sometimes unreliable, there is so much activity in the seed technology space that it is not easy to see how scaling up is actually being done, spillover effects and unintended outcomes need to be captured, and the private sector partners require indicators in tune with their own interests (sales, profits, bottom line) and may not be interested in farm-level data associated with adoption. So AGRA is using a number of methods to address these challenges, including:

- constant field monitoring and data validation,
- learning from results to identify new opportunities,
- traceability studies, outcome panel data studies,
- impact evaluations,
- a Partnership Dashboard, and
- more careful efforts to identify direct beneficiaries and manage attribution of results to all partners.

With these approaches, AGRA and the SSTP implementation team will attempt to document and communicate success stories, with direct farmer input.

Theme 2: Scaling Up Through Value Chains

The final GLEE session for all participants attempted to bring the scaling-up framework and all the theme discussions into an integrated whole by focusing on scaling-up through value chains. Most USAID missions – and many other development organizations – are using the value chain concept as a way of coordinating their activities and scaling up impacts (often through what Johannes Linn referred to as either a “service expansion” approach – where services such as provision of improved seeds or blended fertilizers are extended to involve more people in a given area – or a “functional expansion” – where programs add additional functional areas of engagement, e.g., post-harvest handling or marketing to complement production-oriented interventions).

Jean-Michel Voisard, of Projet Croissance Economique (Economic Growth Project) in Senegal, led off by describing the approach used to successfully scale up adoption and use of Nerica rice varieties in the South Forest Zone of Senegal over the last five years or so. Scaling up the seed value chain was the initial vector for scaling up farmer adoption of the new varieties. With improved seed availability, three “drivers” accelerated plantings of Nerica rice varieties:

- yield potentials that were more than triple those being achieved before;
- the potential for greater household incomes – especially as the early adopters became seed suppliers to others;
- shorter meal preparation times than with the traditional millet staple, an important time-gain for women; and good nutritional value.

The project addressed several of the “spaces” or enabling conditions essential to facilitating sustainable scaling up of adoption:

- access to finance for the initial year,
- promotion of full seed certification for seed producers to enable them to build commercial markets for seeds and quality for financing from local rural banks thereafter;
- introduction of tracking databases at the local network level to enable the farmers themselves to monitor their performance;
- engagement of lots of public and private partners to provide services and information;
- working with rural banks;
- villagers discussing the yields and implications as well as causes and the data is shared with regional centers;
- specific attention to gender differences: answers differences, why in some areas women are the majority and in others it's the men; and
- a strategy for building up milling capacity as production capacities grow.

Luis Pereira, of TechnoServe Mozambique, added to the soybean story introduced earlier in the GLEE, emphasizing the importance of: having an expanding end-market in the value chain to ensure that new adopters of soybean production technologies could look forward to good farmgate prices; the policy environment (currently good because a more stable exchange rate introduced more certainty on imported input prices, but negative with regard to the imposition of VAT taxes on local animal feed producers but not on imported animal feeds); the advantages of having manageable input prices so that farmers' risks are moderated; and the benefits of having a diverse farm community that could offer opportunities to smallholders as well as to larger commercial farmers.

Richard Jones, Director of the SSTP program in AGRA, emphasized that, while the Scaling Seeds and Technologies Partnership activity is new and expected to deliver impact within three years, it is building on seven years of AGRA experience in seed systems, soil health, markets, partnerships for policies, and strengthening farmers' organizations. Many lessons have been learned as seed systems have been developed as value chains in their own right. The end-market for seeds has grown as small entrepreneurs have multiplied seed from the public sector and private sector agro-dealer networks have developed to ensure access to small farmers. While the Partnership will have to understand national priorities and the current landscape, AGRA/SSTP intends to trawl for new technologies, with IFPRI/HarvestChoice to help screen their relevance and applicability, and then to develop requests for proposals that will develop new agribusiness clusters. The strong focus on supporting local capacity is an AGRA competitive advantage. It may be necessary to expand spaces for market development though regulatory reform, however, as it is essential, in the value chain approach, to focus on demand, and not just to push supply.

Tom Randolph of ILRI and Director of the CGIAR Consortium Research Program (CRP) on Livestock and Fish, talked about integrating research in real time with the value chain as the integrating operational unit. The challenges that the CRP researchers have had to take into account are: understanding scaling up as a longer-term process, addressing all the essential enabling conditions or spaces needed to translate research into development impact, considering whether technology wags the value-chain dog or whether demand really drives innovation in the value chain, incorporating learning in our value chain, and determining what technologies make the most sense to invest in. Further, he concluded, in order to work with development partners at large scale and in real time, it is essential to partner with the private sector, not to simply rely on government organizations and parastatals.

Key elements of the CRP approach at the value chain level:

- Identify the problems and gear research to address those problems.

- Make it pro-poor, that is, generate products for poor producers and households that are not exported out of the local food markets.
- Recognize that there has to be research investment up front.
- Decided what is replicable about technologies (including improved practices) and what is not. The goal is to stimulate scaling-up of pro-poor value chains.

Louise Sperling of the Syngenta Foundation focused on the scaling up of seed value chains. Her work with the scaling seed systems study conducted for USAID showed that formal (i.e. for certified seeds sold by licensed dealers) and informal value chains for seeds (i.e., uncertified, perhaps even unidentified, seed sold in local markets) exist simultaneously. Local markets for seeds, however, were shown to be critical for more than half of the farmers surveyed; only 30 percent saved their own seed. She recommended that integration of the informal and formal seed value chains could potentially increase access to improved seeds and reach more buyers by working through existing structures that are already operating at scale.

V. CONCLUDING REMARKS AND TAKEAWAYS

A quick poll of GLEE participants, followed by concluding remarks by Julie Howard and Richard Greene from USAID/BFS, wrapped up the sessions. The key takeaways highlighted by participants were:

- Surprises/learning moments: Participants came in with different definitions of what scaling means, but we can now move forward together. We are all facing similar challenges regardless of sector, organization, or region. We now recognize that scaling requires development of effective plans with partners, especially in the private sector. In short, there is more to scaling up than we originally thought-- but there is a method in USAID's madness regarding its focus on the topic! There are examples out there – soy, teff – that we should draw from. We now have tools to understand different ways of moving.
- Actions participants might take: Providing guidance to implementers; learning how to use new tools; considering program development from a “big picture” sense – lifting our heads from the weeds of implementation from time to time; ensuring diversity around systems; and using innovative approaches (such as improvements to market adult cattle) to help improve and accelerate cash cycles.
- What USAID should do: USAID programs should include CBAs; consider timing and impacts of projects; diversify program work; be bolder; include a policy focus; create partnerships before scaling; and include guidance for better donor coordination over the long term for scaling. It is critical to keep Feed the Future topline indicators (reducing poverty and undernutrition) at top of mind, as well as the role of the private sector.
- Partnering: Keep in mind that private and public sector can have different work approaches and objectives; it is important to invest in dialogue on shared vision and supportive actions to achieve it. When introducing new innovations, look through the eyes of the person who is being asked to adopt and consider what information is needed to support or address questions/concerns.
- Value chains: Scaling represents a new paradigm that represents more than a value chain approach. Value chain concepts are useful, but consideration to bridging private sector, civil society, and partners toward a dedicated goal to improve outcomes is key.

In closing, **Julie Howard** emphasized keywords circled in her notes: catalytic, linchpin organization, unusual alliance, trawling for technologies. “We learned,” she said, “that the scaling idea starts at day one of a project.” The value chain concept has helped us a lot to explore partnerships, but “we need to go on steroids with partnerships!” She congratulated the GLEE participants for their active engagement,

being unafraid to ask questions, with “how do we make good decisions with multiple objectives – income, gender, climate – in mind” being an important one.

Richard Greene, Senior Deputy Assistant Administrator in USAID/BFS, concluded with a few reflections and clear advice: first, do a plan for scaling from the beginning – be careful about planning great pilots that cannot be scaled up; second, provide a context for results – what percentage of the population are we reaching, targeting in our vision; and third, remember that nutrition is an important outcome for Feed the Future and we need to scale up nutrition programs, including production of high-value commodities like orange-fleshed sweet potatoes and golden maize, across the zone. USAID will, Greene assured the group, take the ideas and learning generated in this GLEE forward. The plan is to continue to develop plans for scaling-up agricultural technologies for impact and strengthen implementation in 2014. Portfolio reviews will offer one opportunity; a worldwide conference on Feed the Future might be another possibility.



Recommendations

While participants as individuals acquired many ideas to guide their future actions in planning and implementing programs that could successfully scale up the adoption and use of agricultural technologies in Africa, four major recommendations emerged from the GLEE.

1. Spend the time necessary to do effective ex ante analyses before finalizing a plan for scaling up. These analyses will help to: understand the institutions essential to making progress along the pathway selected; assess the costs and benefits of proposed approach; identify gender-related issues; and determine the potential for scaling up to population levels (perhaps through partnership with others, major policy change, or use of better geographic targeting). Consultations with stakeholders will help to define “the problem” more clearly and may lead to solution sets that leverage the individual interests of diverse stakeholders while contributing to systemic transformation. Thinking outside the box may identify new opportunities for intervention. Analysis will also help to address the common dilemma of trying to achieve multiple objectives in a single project or program.
2. Pay attention to the “elephant in the room,” that is, that the context for scaling up the adoption and use of new agricultural technologies involves integrating informal farm-based operations into formal institutions. This means, for example, that markets for inputs and commodities need to be competitive, reliable, and efficient – and open and fair to smallholder farmers. Lending institutions need to provide short- and long-term financial services – and have the confidence that small farmers as borrowers will repay. Farm-based organizations, with independent smallholder farmers as members, need to be able to enter into legal contractual relationships for services and sales – and need to ensure that those contracts are respected.
3. Partnerships are essential to scaling up the adoption and use of technologies – and sustaining the process of innovation over time. The value chain concept helps to identify the range of partnerships that are critical, but there are many barriers to effective partnership – lack of trust, use of different languages, different interests, and different metrics. Finding the “right partners” is worth the effort. Who are they? They are people who add value with special knowledge, are familiar with the area, and already have long-term relationships in place. They are people who can help to reduce risks, support innovation, clearly understand the strategy and are committed to action. They are women as well as men, business owners as well as civil servants. “People are people; when they get together, they get energized.”
4. Take the long view. Scaling up is rarely accomplished with one project or the introduction of one technology. A second project may be necessary to continue to expand services in a geographic area, and a third to replicate it in a similar, neighboring area. A number of initiatives may be

needed to accomplish vertical scaling up, that is, mainstreaming the approach through policy, legal, or institutional reforms. And, as with innovation process, new opportunities and new obstacles will emerge and ways to engage in different functional areas may need to be found.

ANNEXES

Annex I – References

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