

## CHANGING AGRICULTURAL AID THROUGH UNDERSTANDING FARMER SEED SYSTEMS

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AUDIO TRANSCRIPT

OCTOBER 09, 2014

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## PRESENTERS

Robert Bertram (moderator), USAID Bureau for Food Security

Julie March, USAID Office of US Foreign Disaster Assistance

Louise Sperling, Catholic Relief Services

## PRESENTATION

*Zachary Baquet:*

Good morning, and welcome, everyone. My name is Zachary Baquet. I'm a knowledge management specialist for the Bureau for Food Security, who is sponsoring today's event. I'd also like to thank the support we're getting from the Knowledge-Driven Agricultural Development Project to bring you this event today.

So just some quick house rules. Please, if you've got a cell phone – ha ha, you know, everyone does – please put it on silent or vibrate for the rest of the presentation. Also, please save your questions until the Q&A sections in between presentations. When asking a question, please introduce yourself and tell us your organization. We'll be going between our in person audience and our online audience, which is – also, welcome, our online audience, which is now around 80 or so participants from around the globe. We've got folks from India, Mauritania, Italy, Tanzania, Austria, as well as across the United States, Arkansas, South Carolina, Indiana, Oregon, and the like. So quite a global presence.

So with that, I'd like to bring your attention to a couple of upcoming Agrilinks events. First, on the October 22nd is our next Ag Sector Council. It's going to be "From Smallholders to Shareholders: Optimizing Private Sector Partnerships for Smallholder Impact." On November 18th through the 20th is our online forum, Ag Exchange, will be taking place on Agrilinks. It's "Feeding the World in 2050: How Human and Institutional Capacity Development Can Support Agricultural Innovations Systems."

And with that, I will introduce our moderator for today's event is Rob Bertram, chief scientist for USAID's Bureau for Food Security, and he will do introductions. Thanks.

*Robert Bertram:*

Well, good morning, everyone. Thank you, Zachary. I'm really delighted to be here and to see all of you here. The topic we're going to talk about today has been right at the center of the whole agricultural development concept and implementation, really since the beginning of time, but most recently, since the beginning of say the green revolution, where seeds were a key vehicle for delivering a set of technologies. Not the only vehicle, because there needed to be a lot that went along with that. But it was a critical piece of it.

And despite the fact that seed has been so central to the agricultural development enterprise and the agricultural relief enterprise, the food security relief enterprise, it – the whole concept of seed system has remained somewhat elusive, and a real bottleneck.

If you stop and think about how much donors like USAID invest in the CGIAR systems, breeding programs, or in our Feed the Future Innovation Labs, our US university programs that are developing crop varieties, it almost begs the question of, well, why aren't we doing more to make sure that that last stage of actually getting the product of that research and development work to the farmer through whatever means, why aren't we able to really make that function better?

And there's been, as I would say, two investment streams, one on – as I mentioned, on the emergency side, and this actually goes back for my thinking to, well, the – after the Cambodian genocide there was a major effort in Cambodia around rice and other crops, and then there was anticipation of the need for this associated with the great concern about a drought in Southern Africa in the late 1980s, and that was – I can remember aid mission directors saying, we need to prepare for this. We need to be multiplying seed off season, and so forth.

And then I think the – but the world really saw how this works in the context of the Rwandan genocide, and Louise Sperling, who is going to be one of our speakers, was somebody who lived through that and who was firsthand witness to how the community, the agricultural development community, but more importantly, the agricultural relief community, stepped up to try to ensure that Rwanda's farmers could rebuild based on appropriate varieties of seed.

Then we have on the other side more formal systems approaches with especially emphasizing the private sector. And I think in a very simplistic way, we could say that both of these avenues are critical, and they both intersect, and probably they both have potential to undermine each other if not done correctly. And this is why I think the topic of this morning's discussion, where we're really going to think and learn about best practices, because we've learned a lot over these 25 years, and I'm very pleased to say that USAID has been at the forefront of this, and our other speaker, Julie March from the Democracy, Conflict, and Humanitarian Assistance Bureau, has been the leader in our agency for many years now in shaping these emergency relief programs so that they dovetail and support and somehow enable the next step towards development intervention.

So it's a matter of really meshing both streams, both of which are critical, and both of which I think support complementary aspects of seed systems as they exist on the ground in many countries in which we work.

So a few key concepts. One, we don't want to do harm, and again, we've – I think we've learned a lot, and we're going to hear about that. The – I think we can also think about this going forward as we answer Administrator Shaw's call for us to focus on technology scaling. He says we're investing all of this work in research and development. How are we going to get this out to the farmer?

Well, here's a lot we can learn from the NGOs that have worked in this area, Catholic Relief Services, which I was going to mention before I knew that Louise

was actually with them now, Mercy Corps, World Vision. There's many others that have learned a great deal.

And so as we talk about scaling seeds, which is – if you've been in the Bureau for Food Security over the last year, or in the Feed the Future context, there's been a great deal of discussion of this. We need to learn from those examples.

So we have partnerships with AGRA on seed systems development, another critical partner here going forward. And in some cases, we're talking about say drought tolerant maize, so a lot of private sector involvement. But in other cases, we're talking about things like cowpeas. So you really have to understand how these systems are distinct from one another and how they coexist and how they can work off one another.

Finally, I – and I wanted to also just flag in terms of that more formal approach the work that our colleague from the Markets Partnerships and Innovation Office in the Bureau for Food Security, Mark Huisenga, is doing on that side, and also the policy dimension, which our policy team and Dave Atwood, who is with us this morning, is also bringing. So it's a matter of pulling together these pieces, and I would also add that we all know that we're on the hook not just for production outcomes, but also for outcomes around gender, outcomes around nutrition.

So the information piece that can be part of this outreach, whatever it looks like, through the various kinds of innovative partnerships that we are developing, has to be considered as well. So again, it's just a real pleasure to have both Louise and Julie here this morning. Louise is really I think probably the person most identified with the whole issue of emergency seed relief in the CGIAR system, in the NGO community, and beyond, going back many, many years, so it's a great pleasure, having known Louise for really all of those years. So we're – it's great to have her here.

And Julie also having really picked up the mantle that I want to say – I want to credit Administrator Natsios, too, for those who remember. He really saw the connection here between the opportunity embodied in a seed and the role of our efforts to prevent, mitigate, or otherwise forestall, ward off famine, crop failure, and other kinds of disasters that have always unfortunately been part of the landscape.

So with no further ado, I am delighted – who is – Julie is speaking first. Thanks. So I'll turn it over to you, Julie.

*Julie March:*

Oh, thank you. Okay. Many thanks for that thoughtful introduction, Rob, and a special thanks to everybody coming out this morning. It's nice to see some new faces and old faces as well. And thank you as well to KDAD and Agrilinks for doing all the logistics for this process. Excuse me.

Today, our topic is one that, as Rob mentioned, I've been thinking about and watching evolve over the past decade, changing agricultural aid by better understanding farmer seed systems. It's something that is important to those of us on the emergency side, as well as the development side. By designing better programs and strategies as a result of this understanding, we can really start to benefit all parts of global agricultural programming, from relief to development.

So we're fortunate today to have Louise Sperling with us. As Rob mentioned, she's been in this challenge with us for the past decade at least, and was there well before we got here. And between the two of us, we plan to cover the following key points, and at the end, we hope this stimulates a very lively discussion. We want to hear your thoughts on this, and feedback as well.

We're going to kick off with a discussion of how humanitarian responses for agriculture have changed, and consider what the driving forces were of those changes. Then I'll briefly highlight how OFDA, USAID's Office of US Foreign Disaster Assistance, has supported evidence and assessment-based response and tool development.

From then, we'll move over to Louise's presentation, where she'll be highlighting some of the tools that have been created, and offer real life examples of where these tools and assessments have changed the course of emergency responses. So we intended to go one way, the assessment said something else, and we completely changed the plan for the better.

And finally, we'll look at how we can apply those models to programs that do have more developmental objectives, because I think it's a worthwhile endeavor for both sides of the house.

So I spent a good part of last week looking at OFDA annual reports dating back to 2002, and the thing that struck me the most was just how much our agricultural responses in emergencies have changed. They've greatly expanded. In 2002, there were a couple of complex emergencies, but those were really limited compared to the number of acute emergency responses that we did where seeds and tools were the method of providing agricultural support.

For those of you not familiar with the terminology, an acute event would be something like an earthquake, a flood. We have all kinds of acute responses, a volcano eruption, where people really just have a disruption in their ability to access seed for that year. We provide the seed and the problem's solved.

In recent years, though, we've shifted to support a larger number of more complex emergency responses, and these last a lot longer and differ greatly from an acute emergency response. And one thing that was interesting to me was that looking at the 2002 report, we were supporting food insecurity in Somalia in 2002, and a drought response in Kenya in 2002, which are things that, for those of you who

have been around for a while, have seen come up again and again. These are things that don't easily get solved with a bag of seed.

Okay. So because of that, because of the duration of these events and the length of programming required, what we do in emergency response really does matter. They're not what we like to call one-offs, where you send the seed, problem solved, farmers move on to agricultural production. And over time, implementation of programs that are based without a good understanding of the systems, agricultural systems and market systems, can really have negative consequences on enabling transition out of the emergency phase towards the development phase.

So I included this photo. It's of a market garden project we supported in an IDP camp in Darfur, so internally displaced persons. And I haven't fact checked it, but it's my guess that these people are still in this camp and are still struggling with issues related to seed availability and access. And largely, that's because the issues surrounding this event are not easily fixed with a bag of seed. They're issues related to poor market development, conflict, limited road and market infrastructure, and protection concerns. And so I just highlight this, that there's a lot more to a farmer's ability to farm and be food secure than providing seed.

This is a slide from our 2012 annual report. These are all online, if anybody wants to go through them. It's actually an interesting read, to see how they've changed over time. But I put this up there for a couple of reasons. One, just to highlight the number of disasters that OFDA is involved in, and I think we reflect as well the general global humanitarian community.

In the bottom left, I'm not sure if you can see it, but right here, this slide of the pie is the amount of the resources within that entire amount that's dedicated to agriculture and food security. And so I wanted to just show you that although every year, all the sectors kind of wait to see who comes up first, we're usually numbers between one to three after WASH and health interventions. So ag and food security is a large component of the funds spent on emergency response.

Talking about how we've expanded, in 2002, OFDA programmed about \$260 million. In 2013, we were up to \$883 million, and of that, \$72 million was just for ag and food security.

Now in a lot of sectors and a lot of programs, \$72 million does not seem like a lot of money. I mean, I've heard programs that along are \$50 million. But when you in terms of seeds, \$72 million worth of seeds is quite a lot of seeds, so it's something to really think about.

So I share these numbers largely just to emphasize my conviction that I've had for years that for our beneficiaries and for the proper use of US government funds, we really need to make sure that we're doing this the right way. Seventy-two million

worth of emergency ag programming is a big deal, especially when you're looking forward to developing ag markets and seed markets.

So with this general understanding that there's a great potential to get things wrong and there's a great potential to repeat these wrongdoings year after year, and in emergencies that just don't seem to go away, the global humanitarian community for about a decade has been talking about the need for better evaluation and better tools for evaluation of seed programs. Cool. There you go.

People that have been talking include our NGO partners, US government, other donors, FAO, all the UN organizations as well, have been quite involved in this discussion.

And the discussions center around a couple of main questions. The first is was seed need accurately described with the tools in use? For a long time, the tools being used to assess seed need weren't specific to tools, but really looked at agricultural production or household food security.

And the second question that we've been pondering for a long time is whether the – whether seed was the actual cure for the real problem. So was throwing a bag of seed going to solve the problem, or was it a chronic issue, as I mentioned in Darfur? Is it related to poor market infrastructure, poor road access, and a whole host of other issues? Without understanding the root of the problem, I feel that it's virtually impossible to treat and solve the problem.

So a lot of people that have known me for a long time have been I think amazed at how excited and frustrated I can get about seeds, because they say, what's the big deal? It's just seeds, right? And then they see me start to use hands and get all flustered. But the real question is, are we doing no harm with our interventions? And that's a key point for us as humanitarians, and thinking long term.

I also think it's important in light of our competition for limited resources. So looking at the global scope of need, does providing seed make sense, and is that the route to solving some of the problems and underlying issues?

There's also the age-old concern over dependency and creating dependency within our beneficiary population by providing free goods to farmers. So for a long time, the standard methodology of seed provision was direct seed distribution, without a lot of thought given to farmer preference, market development, different varieties.

And so my next point, the big concern is are we limiting access to new varieties? And I put that in there because the old model of providing seed was a one size fits all, this is what you get. Farmers didn't have a lot of say. Fortunately, we know better now, and I think our partners are doing a lot better in being creative about the ways we address seed distribution. But there is the concern that we're not letting

farmers make the choice by providing free seed. And we also have the potential to disrupt local markets, both informal and commercial.

And finally, ag interventions that aren't based on a understanding of the system can really limit farmers' own capacity to manage their risk and to reduce their risk of shock, and to adapt to the changing environmental and market conditions. So when a farmer has access to a thriving seed market, they have the ability to make decisions that can change how they respond to chronic and acute events.

So OFDA has placed a strong emphasis on assessment-based evaluations and tools that look at systems. In the economic sector, we have supported the EMMA, which is the Emergency Market and Mapping Analysis tool. And within the ag sector, we worked with CRS and CIAT to support the creation of seed system security assessment methods and tools, and Louise has been the driver for all of this.

The really important thing about these tools is that they allow us to evaluate rather than assume need. We're able to pull out chronic versus acute issues, and we can help respond – help design responses that really target the actual problem, not the assumed problem.

These tools also allow us to track trends, so when we do an assessment in an area that's not in a state of crisis, it gives us a baseline to look at later on and see what happens when there is a crisis.

These tools also really encourage multi-stakeholder participation. Every assessment that's been done has included a wide range of actors, and I think that collectively, this allows a more strategic and focused strategy and approach within the sector.

And finally, ensuring that emergency activities support rather than undermine markets allows us to increase the likelihood that transitioning to market-based activities is more likely to be sustainable and have a greater shot at happening.

And then just to end, I want to share with you something that Louise will also talk about, but this is a site that holds all of the assessment tools that have been developed. It's a wealth of information. There are all of the past assessments that have been done, some guidance briefs for practitioners and people who are just interested in seed, and I hope you all visit it and take a look at it. So thank you.

*[Applause]*

*Zachary Baquet:*

So we wanted to take five minutes for any clarifying questions if anyone has any. We've got about 108 people online, and a little over probably 40 to 50 people here in person. So any questions?

*Male Audience:* Hi. This is Ravi Nayak with IRG Engility, and just a quick question. With the quick need for response for the seeds, how do you conduct the assessment quick enough to understand the market system to then be able to distribute the right amount of seeds or the right variety of seeds that's needed by the beneficiaries?

*Julie March:* That's a great question, and one that we've contemplated – did you want to take – okay. One that we've contemplated in supporting the development of this assessment tool. The assessments can be done incredibly quickly. They're real time. There's capacity to generate data on the spot. And that helps shape the direction that the interventions will go. So they're actually not very cumbersome in terms of turnaround. We're talking a week or less. And if it's a real sudden onset, we're able to adapt to that.

*Female Audience:* My name's Diane DeBernardo. I'm a nutrition advisor in the Bureau for Food Security, and I used to work with Julie at OFDA. I was curious, in the development side, we've been looking more and more at also responding to nutrition security through agriculture. I know the context in emergencies is quite different, but do you think there are opportunities to do that, especially during a more acute emergency, to actually address nutrient density as well as food security more broadly?

*Julie March:* Absolutely. That's a great question, and something that we have been thinking about, and Louise is also working on. I think there are tons of opportunities to look at providing a greater diversity of seeds when we respond, which will then, paired with nutrition education, hopefully lead to greater dietary diversity, better nutrient density. So it's definitely something we're moving towards.

And to do production just for the sake of production doesn't really get us anywhere, so both income generation and nutrition improvement have been two streams of thought for us on this.

*Zachary Baquet:* Any other clarifying questions? If not, we'll move on to Louise.

*Louise Sperling:* So I think the mic is on. Is that correct?

*Robert Bertram:* Yes.

*Louise Sperling:* Good. Well, good morning. It's a real pleasure to be here. We are going to focus on seed systems, but from the start, I want to say our focus is on smallholder seed

systems. We will be looking at stress periods, but please know we're also looking at normal developmental opportunities.

Okay. Why is seed a strategic issue? And it's not an end of the line issue. Okay. Why do we have to think about seed right now? Well, first, seed is the entry point for vulnerable populations just after disaster. This data has been kindly shared by FAO. What you see in a six year period from '97 to 2003 is that FAO in the emergency side increased their portfolio sevenfold. In 2008, in response to the food crisis, FAO had seed plants for 48 countries. These are the most figures from FAO. It's not all seed, but a good chunk is, and it's \$750 million US. So seed and the vulnerable are also linked, often linked. Whoops. There you go.

Second, I don't know if you know about seed and commercial development, how big it really is. These are the latest figures. Two thousand fourteen, the commercial seed sector is \$45 billion a year. GM alone is \$15 billion a year. So seed is big business.

Finally, seed is the vehicle for new varieties. Anyone in plant breeding, anyone in agricultural development, if you don't have seed systems, your varieties don't go out.

Now across Africa, seed systems new varieties, especially for maize, for horticultural seed, sometimes for groundnut, but not much else.

So why is seed strategic? It's linked to the vulnerable. It's linked to big dollars, and it's linked to developmental impacts, so I'm really glad we're talking about it today.

Just introduction on terminology. Farmers generally use two types of seed systems, okay? Let's see if I can get this to work, and it doesn't. Okay. Good. There it goes.

There's a formal system, and for you online, that's kind of the red outline, which is modern varieties and certified seed. It comes from government, commercial sector, or sometimes relief. And then on the inside here, there's an informal system, traditional system, farmer system. It's all the same. That is seed from own stocks, exchange, or here, from local markets.

Studies worldwide now show that 90 percent, or to be exact, 91 percent of the seed that smallholder farmers use comes from this informal, local traditional system. So absolutely we have to work on both the formal and the informal to have impacts.

Other point on terminology. We're going to talk about markets a lot in this talk. I'm sure most of you know these agri-dealers markets, formal markets. They're well-known. Equally, there are local markets where farmers get seed. Just to be very up front, not all grain can be sown from these local markets, but there is a subset of grain that might be the right variety and that's pretty good quality. And increasingly, technically we're calling this potential seed.

Okay. I'm going to move forward now. My talk's going to be in two parts, just so you know. The first part is on emergency, and then we'll have a short video from Zambia, and the second part is on development impacts, and how we're going to move forward, how we're going to scale up. It's a real opportunity to be able to talk about emergency and development in one talk, and increasingly, I hope we do that in action. So this is a great opportunity today, and it's very unusual.

Okay. What happens to seed assistance during a disaster? We have a body of evidence, empirical studies, that dates about 20 years. I'm just going to give a few examples.

This is Rwanda. Rob talked a bit about Rwanda and the genocide. As you know, the genocide hit right in the middle of the growing season. Two million people were on the move. Thirty different agencies were giving seed in a country the size of Switzerland or Vermont.

Where did the seed come that farmer's actually sowed? I mean, some real surprises. So what you see, and this is a few – a few months after the genocide, the first column, 45 percent came from own stocks. A quarter came from the market. A bit over a quarter came from relief aid.

You know what? I'm just going to stand here.

Okay. The second season after the genocide, 40 percent from own stock, half from market, so over 90 percent from local channels, even though aid was being given.

Now this didn't mean that farmers didn't have problems, and this is a huge sample size for a disaster. You see it's 883. So we asked farmers, okay, you have seed, but have you lost key varieties? Most of them said no. A third said yes. But they said, listen, you're asking the wrong question. We've lost varieties, but we know where they are. They're available. The problem is not availability. The problem is money. The problems are our neighbors won't share them.

Second disaster, new crop, new disaster, new country. This is a drought in Kenya. Nineteen ninety-seven, the government is getting hybrid maize. Where did the maize come from that farmers actually sowed? Okay? Fifty percent here came from the market, 30 percent came from local stocks. Seed aid had a minimal presence.

Haiti. New country, new disaster. I suspect that many of you were involved in Haiti. And this one we've done across crops, okay? So this is a wide range of crops. Where did the seed come that farmers sowed? In Haiti, 75 percent from markets. This is our seed aid. Four percent.

Okay. So from a large number of cases, and we have many, many cases, we're getting, gosh, a general set of scientific findings. Local systems are relatively durable.

It's surprising us. The common problem for farmers is access. It's not availability. And for some crops, local grain markets are the core of stability.

Now we also look long term. You know, we're not stopgap people. This is an example from Kenya. We followed seed acquisition tendencies \_\_\_\_\_, so 1992 to '97, that's nine seasons, ten seasons. What you see in ten seasons is that there are farmers who have received seed ten times. So we're treating the problem as acute, give seed, give seed, give seed, give seed, when indeed the problem is chronic, poor soils, disease buildup, very little land.

So this observation that we're giving an acute response in a chronic context is having us to rethink about seed security. And in a normal time – this is seed security threshold. In a normal time, and this is the normal, there's a part of the population that is seed secure, and then there's a fairly small part, mainly the very poor, who are in insecurity.

In a crisis, two things happen. First, the whole line goes down. People are stressed. But a large portion of the population potentially can enter seed insecurity unless we respond well.

So yes, in a crisis, we have to look at the immediate effect, maybe give seed, maybe, but equally, in chronic stress areas, acute interventions are not being shown to be effective. So even in a crisis, we have to start to think longer term.

Now despite this, this is our current practice. There are many countries, many in Africa in which we're giving seed again and again. I think Burundi it's 28 seasons in a row. Julie mentioned in DRC it's now ten seasons in a row. I think Ethiopia has the record, 34 years straight.

Okay. Seed security, matching response to specific problems. Thinking about disasters has helped us to conceptualize a framework, and this very much parallels the food security framework. Seed has to be available. That is, there has to be sufficient quantity of seed of appropriate crops available within proximity.

Seed has to be accessible. People have to have adequate income to get it. And seed has to be of the right quality. And for seed, there's two aspects of quality that are important. It has to be healthy and the variety has to be adapted.

Super easy framework. But how does the framework guide our response, and start to think about the ranges of response. And I think this framework is just as important for developmental seed sector development as it is for emergency.

So if seed is not available in the short term, we give seed, but this rarely happens. If seed is not available in the long term, I think farmers should leave farming. It means it's an unsustainable system. Here, the problem is only with new varieties. Okay?

If farmers don't have access in the short term, you give them vouchers and cash. But if farmers have access problems again and again, you don't do vouchers and vouchers and vouchers and vouchers. You move. You move to income generation, agro-enterprise, value chain.

Okay. Is seed is a poor quality, if that's the problem you find, well, you can do things in the short term. You know, you can give high quality seed stopgap. But the real trust has to be on long term enhancing of quality with seed companies, on farms, local markets.

Then, of course, if you don't have the right varieties in the short term, not much you can do, but in the long term, you work on breeding. Okay?

So depending on the seed problem, there are different kinds of responses. But equally what we're finding is that you have to have a goal for seed sector development, and not all the goals are the same. So is your goal for commercial crops? Is your goal to move a basket of crops? Is your goal to address nutritional issues? Is your goal to get seed systems for drought-prone areas? The goal is going to shape your intervention. Very few of us articulate the goal.

Finally, just on this conceptual piece, seed systems are moving quickly. Increasingly, there's a subset of NGOs who are working on seed systems for nutrition. Just so you know, in the short term, there are new responses that are developing. I don't know if you have heard of DiNERS, Diversity and Nutrition Fairs for Environmental Resilience. So even short term, when you have a week to act, you can think about nutrition, and in the long term, you should be thinking about vegetable seed enterprises.

And once again – whoops – OFDA has taken the lead, and we've just issued a set of technical briefs on vegetable seed, vegetable seed in crisis, vegetable seed in chronic stress.

Okay. Moving forward, seed security. Food security and seed security have only recently been distinguished. Now they are related, but they're not the same. So look at these phrases here. Think. Think about your own experience. Households can have enough seed to sow a plot, but little to eat. Is that true? Great. It's true.

Households can have adequate food, but lack access to the seed to make their plots productive. True. We all know that. Okay? Well, if that's true, why is our track record abysmal? Okay. So what did we do before 2005? Well, before 2005, we had three types of options. We did no assessment, and we gave seed. We, second, sometimes did food need, and then we assumed seed need. No one's ever done that in this room? Yeah. Third, there was a production drop and we assumed seed need.

So for much of our history of doing aid, assumptions, not facts, have been guiding our response. And I just want to take this third on here on production drop and

show you why it's wrong. I don't know if there agronomists in the room. Any agronomists in this room? My colleagues here can do this on the back of an envelope. But these are some basic agronomic facts that were in place in Ethiopia, which is a drought-prone zone. Okay?

In Yaso, which is near Harar/Gey, farmers have three-quarters of a hectare. Sorghum, to sow that sorghum, they need 11 to 12 kilos. In a good year, they'll get 1,600 kilos. In a bad year, they get 260 kilos. Okay?

So 11 to 12 kilos. In a bad year, you get 260 kilos. You only need five percent of your harvest for seed. Right? So you can have a food problem, but you need a minimal part of your harvest for seed. So a production shortfall is not equal to a seed shortfall. Any of you who get a drought proposal and someone tells you you need seed, make them do the calculations.

Okay. Methods for seed system security assessment. It's OFDA and it's USAID together who have really been the pioneers in funding these assessments, so thank you. And much of this work has been done in the last five years, so it's relatively new.

In a seed system security assessment – let's be very clear. We're not calculating seed needs. Okay? When you calculate seed needs, you always need seed. What we're doing is we're looking at the functioning of seed systems. We're assessing if there's a problem. And then we're matching the problem to the response.

And I want to show you again, in this method, we can look at acute problems and chronic problems, but we're also using it to look at developmental opportunities.

Here again, this diagram, what seed systems look like. This is what we're looking at, all the components. But also, to get practical, seed systems, the importance of seed systems differ by crop. This is just a theoretical example from East Africa. What you see for beans, generally, the two channels which are important are home stocks and local markets.

For cassava, it's different channels that are important. Social networks, own stocks. Now what this means is if there's a crisis and local markets break down, beans are affected, but cassava isn't affected. If commercial markets break down, maize is affected, but to be honest, beans and cassava might not be affected.

So how do we think about stress and which channels are going to be affected? It's not that hard, but it takes some understanding of seed systems. Okay. We've done the last four years these seed system security assessments in a range of countries, mostly in Africa. In addition, in Timor, \_\_\_\_\_, and Haiti. Just so you know, many of these sites are repeated stress. South Sudan, Eastern Kenya, Eastern DRC, Southern Malawi, even Northern Mali, these are places that we're intervening again

and again. So we can use these baselines to shape our current response. So these aren't just quick inventories. These are also baselines.

Let me just give you a quick example how one of these assessments changed practice. We're looking at practice for both emergency and recovery and also for chronic stress. Okay? This is Zimbabwe 2009. I don't know if on the web anyone was here in 2009, Zimbabwe, which was really very unique. So we were on the ground, field teams, many different field teams.

Okay, in 2008, the international community gave \$150 million of seed and fertilizer, mostly maize. Two thousand nine, we're in the field, and the same plans are being projected, \$150 million of hybrid maize mostly, and seed.

Now the rationale, it made sense, I guess. The rationale is that the currency at that point in time was worth less, and there had been a bit of a drought before, so there was this assumption, high stress, no seed. And just for the fun, I don't know if we \_\_\_\_ remember – the guys remember the 50 trillion dollar Zimbabwe note. The currently really was worthless.

What did we find on the ground? Well, the harvest had been fairly good. There was 160 percent over the other season, season prior. Social networks were strong. Forty percent, 18 to 40 percent, 38 percent was coming from social networks. Even though there was no formal currency, there was an incredible alternative market for hybrid maize. Specialized seed producers had surpluses. And agro-dealers were just opening up. Okay? Lots of seed.

So the real problem was that there was no currency circulating. There was low purchasing power. The direct aid which was being proposed, \$150 million, was not only not needed, but it was going to damage the functioning channels. It was going to damage the opening of the agro-dealers. So basically, sorry, the donors very quickly moved to voucher market subsidies and tools. Sorry, market and subsidy tools.

And I want to say that the US in particular very quickly changed course, and the EU came in and others followed. But it just takes one courageous donor to say, okay, this doesn't make sense. Let's change course.

Again, all these tools, Julie's mentioned this is on this new site. I want to highlight that the action plans are there, but also, there are state of the art I would say thinking pieces by many people about relationships between seed security, integrated seed systems, how to move new varieties, so you can use this website, yes for emergency, yes for chronic stress, yes for development, but also for academic purposes.

Okay. It has these briefs. You've seen these. They're in French, English, and Portuguese. It has about 90,000 downloads. You've seen this guide. That's it. Lots of resources.

So in summary, on the emergency side, what are we learning? And it's really surprising many, many of us. First, seed systems are relatively resilient. Earthquake, drought, flood, genocide, civil war, we're surprised. Access is the main problem. It's rarely availability. But there are select cases which technically we can discuss later.

This one's quite important. Seed response has to be tailored to the goal. If you're going for a nutrition response, it's not the same as moving commercial maize. It's a different seed system approach.

Food security is not equal to seed security. Don't ever accept a food assessment alone, and that methods exist which can now sharpen response. And they really exist. They're usable. They're quick to use. We even have automated the data loops. So people who are even not good with quantitative data, you can do these assessments and get evidence-based quantitative results.

That's it for the introduction on the emergency side, but I'd like to bring in at this point before questions a colleague from the field. He's just going to talk about for three, four minutes how a certain organization used seed system security assessment.

Now this is in Zambia, and Zambia's quite unique because they've done two assessments so far. They're thinking of doing a third assessment in a third region so that they can create a national seed security strategy out of these assessments. Okay? So these assessments are not just localized. These assessments can create national strategies.

*[Video, no audio at beginning]*

*Geoffrey Heinrich:*

– so the senior technical advisor for agriculture, based in our Southern Africa Regional Office in Zambia.

I'd like to share with you our experience with the seed system security assessment. We did the assessment recently in the drought prone area of Eastern Zambia. The area has an average rainfall of about 500 millimeters a year, and its typical production system is just maize after maize. Human stunting rates are around 45 percent, which is really high, so it's an area with high stress and repeated stress.

We did the assessment because our partners have been giving different kinds of aid in this area for years, and honestly, had been doing it again and again. Direct seed distributions have been particularly common. And we decided it would be better to

take a step back, to try and understand the root causes of the problem, in addition to the periodic emergency constraints that occur.

We also needed to focus specifically on seed security, so that we could develop refined responses to the problems. In regards to the process for implementing the seed system security assessment, it was relatively fast. It just took only two weeks from initial training to formal public feedback sessions, and it only took three to four days per site. So this meant that even busy professionals could join us, and so, for example, we had the head of the seed certification service who participated.

We looked at all the different seed systems that farmers used to see if they were functioning well, and these included their own stocks, stocks from agro-dealers, and even seed from local markets. We aimed to be non-biased, and though the assessment was fast, it was also very rigorous. It was evidence-based.

There was an interesting innovation in this assessment, in that we had an automatic data analysis loop. The data went into Excel spreadsheets, and the field finally jumped out immediately, seconds later, in formatted tables, which was great.

In terms of the findings, there were lots of important surprises, even for experienced staff. There were also a number of key points for action. One of the major findings was that 95 percent of the seed sown for major crops was just for maize, cotton, and groundnuts, and the lack of diversification was really astounding.

So to address this, we immediately put in place a set of programs aimed at diversification, and these were linked also with enhanced nutrition. As a first step, we introduced what we call our diner fairs, which are fairs to promote diversity for nutrition and enhanced resilience.

There was also some good news on varieties. Overall, 72 percent of farmers had accessed a new variety within the last five years. However, with a closer look, we could see that most accessions, over 80 percent, were either maize or groundnut, and no one had gotten a new varieties of beans or cowpeas or pigeon peas.

So we started a program to encourage commercial seed companies to sell a range of legumes, but to sell them in small packs, very small packs, so the farmers could afford them. The program in the area continues to be influenced by the seed system security assessment. In October of this year, 2014, a meeting has been called in the provincial capital to discuss the problem of groundnut seed supply, and starting with the lack of foundation seed for seed production.

Addressing this lack of foundation seed had emerged as one of our key recommendations from the assessment. So the seed system security assessment was quick, but it was smart, and practically, it really brought in our seed sector program options. It was all very worthwhile, it was very important, and very useful.

Hi. My name is Geoff Heinrich, and I work for CRS as a senior technical advisor for agricultural based in our Southern Africa regional office in Zambia. I'd like to share with you our experience with the seed system security assessment.

We did the assessment recently in a drought-prone area of Eastern Zambia, the area –

*[End video]*

*Louise Sperling:*

\_\_\_\_ smallholder farmers access the seed they actually plant. Thanks to USAID, we now have the largest data set in the world on seed systems. This analysis that I'm going to share with you is from six countries, five in Africa and Haiti. There are three countries where the data has not yet been entered, just to let you know, but this data set right now is 10,120 observations, all collected in the same way, but by 25 or more different partners.

So rigorous, but we think totally non-biased. Where does the seed come that farmers plant? Well, real surprise. Fifty-one percent comes from the local market. A third comes from home saved seed, and this really challenges the stereotype that farmers no matter what save their seed. They save their seed, but not to the degree we thought.

Then I want you to look here at this two percent. This two percent is formal sector and agro-dealers. This two percent is where we've been investing for the last 30 years.

This is the same data, but across countries, so we've just disaggregated it, just to say we have a lot of data here. We'll soon be publishing it. This is just a snapshot. And I particularly want to thank my colleague at University of East Anglia, Sean McGuire, who's managing these data sets.

So what you see is the same trends across countries. Local markets and own stocks are most important. In Haiti, Haiti is an outlier for absolutely everything, but Haiti, 75 percent comes from local markets, which is very scary. Zimbabwe, this is a currency breakdown, so local markets were not as functional.

Listen, in all these slides, there are scary things and there are positive things, so just look at them closely. Just to be clear about seed in local markets, these are the 30 types of crops we found so far. It's legumes. It's maize. It's the cereals, you know, millet, sorghum. It's the vegetatively propagated crops. It's the vegetable seed. It's an array. For those of you who are interested in resilience and giving farmers access to large range of crops, you might want to think harder about local markets.

This is the same filtered by legumes, and again, look at the size of the data set. So legumes – by that, we mean cowpea, pigeon pea, groundnut, faba beans. Legumes

are the core of nutrition for many smallholder households. I don't want to say legumes are the meat, because there's people who don't eat meat, but legumes are the protein.

What you see in this data set is that across the board, 30 to 80 percent of the legumes are accessed from markets. If you're interested in nutrition, if you're doing a nutritional project, if you're interested in health, we have to get these local markets to work.

Now we have looked at maize. Maize is incredibly important, particularly in Africa. And what we did to try to get the best insights is we focused on the two countries which are most maize-centered, okay? Then we focused on the two countries where the agro-dealers and the formal sector works best.

What does this diagram show us? Well, both local markets and agro-dealers are important, local markets more so, local markets providing for smallholders 30 percent, agro-dealers providing 25 percent, both good. But when we started to look at gender, there's something to be discussed. Local markets are much more used by women. Agro-dealers are much more used by male-headed households. Something to think about.

We've looked at wealth and use of channels. We've used land area as a proxy for wealth. It's not perfect, but it partially works. What you see is that this is conceptual. The lower the land area, the higher the use of markets. As land area goes up, own stocks become more important. And then here, these are actual figures. We're very data driven. So just to show you, the smallest landholdings, less than a hectare, half a hectare, 54 percent reliance on local markets. Bigger land holdings, 18 percent. So it goes down as it goes up.

Okay. The last slide I'm going to show you just today, this is how do farmers get new varieties. This is a shocker. Okay? It's a fairly large – right? Sixty-eight percent of the accessions, the way farmers got new varieties was NGO or government assistance, once-off, free, non-sustainable, non-repetitive. Fourteen percent came from markets, seven percent from agro-dealers? Okay? So there are channels we can build on which are sustainable.

Okay. This is just a snapshot of the state \_\_\_\_\_, but what does it say to us generally? To strengthen seed systems, yes, we do need to look at markets, and we need to look at two different types of markets. At this point in time, local markets provide the heart of the seed supply, crisis periods and the poor. They can ensure a tailored response, a greater range of crops. They're especially important for the nutrition-linked crops, and some of the innovation is going in through new varieties through a local market.

But equally, I think we need to intensify our thrust on formal markets. At this point in time, they're incredibly important mostly for maize.

Okay. Moving forward. So we have all these seed system insights, across countries, across stress, smallholder. What are the impact points for intervention? What are the impact points by which we can now scale?

We do have some experience. I want to say this is not business as usual. Business as usual has not gotten us far enough or fast enough.

Okay. I'm going to suggest my teams, very big teams, five action points. Okay. Agro-dealers are important. We know agro-dealers are important. But the geographic proximity of agro-dealers is really something to be remarked. This is a GIS map from Kenya, it's a place called Kwale. What you see is that only 23 percent of farmers are in one hour of an agro-dealer outlet.

Action point number one, we have to expand the proximity of agro-dealer networks, of agro-dealer outlets. There are many ways to do that. How are we going to do that cost effectively?

Point number two, think beyond agro-dealers. Let us go where farmers go. Let us go where farmers get seed. Two models that are being tested many places is to license mom and pop stores to sell seed. So those stores that sell kerosene, sugar, Fanta, chewing tobacco, these stores can be trained to also sell seed. Mercy Corps has done some pioneering work here, particularly in East Timor.

Second, you know, sell seed in public venues. Sell seed in supermarkets. They do it in Malawi. Sell seed in open markets. Let us go where farmers go.

Third, design delivery mechanisms towards the smallholder. What does that mean? You know, the smallholder is not the same as the large-scale commercial farmer. One model that's been particularly interesting is to sell in small packs of seed. So to sell in 200 grams, 500 grams, like this, small packs that farmers can afford, this has been particularly pioneered by TL2, Tropical Legumes 2, a project by Gates, and I see one of my colleagues here in the room. I hope others are online.

But a single project in a single year sold in 2012 950 packets of seed. They did not give the seed free. They sold. Six crops, 13 countries. I know that the USAID administrator has also endorsed this kind of approach.

So what does design mean for the smallholder? Fourth, we need much better information systems and strategic information systems. We now have mobile phones and texts. How are we going to empower smallholder farmers to have choice, to know what varieties are where, what seed source is where, and how they can seed back? So any of you who are doing seed projects, factor in as an output strategic information component.

Finally, five, we invest a lot at the front end. We invest on seed production, seed deliver, familiarization, popularization. We need also now to invest at the back end, help farmers keep the seed they get, keep the varieties they get. This is not a low level investment. This has to be in the future a driving investment. Okay?

All these five points are already started at some scale. In some cases, they've been scaled up. They are doable in one to three seasons, so there's no reason to move forward.

Okay. Final action point. If we're really going to get seed system catalytic change, we're going to have to start to explore new frontiers. The data is just overwhelming. If that many farmers continually access their seed from local markets, we have to leverage the local markets. Traders already move new varieties. How can we systematically link traders to new varieties and new information?

Traders already, if given incentives, will sharpen seed quality. They'll keep varieties separate. They'll build storage warehouses. They'll put products on the seeds to keep the rats away. How do we engage traders in seed quality management? And finally, traders, of course, are great information sources. They move information much faster than we do.

Okay. So the closing slide here, what have we learned from studying systems in emergency, in normal times? First, there are many catalytic opportunities which we now can build on. You know, we can expand outlets. We can design delivery for smallholders. We can develop strategic information. Okay?

Second point, don't ignore the elephant in the room. The informal sector is this elephant. Ninety-one percent overall, 51 percent from markets. We have to think about what to do to improve it. And finally, number three, if we're going to invest, let's invest at scale. Let's invest in what's sustainable.

So this group here and this group on the web, we want to move far and we want to move fast, and there's nothing but opportunity. Thank you.

*[Applause]*

*[Background voices]*

*Robert Bertram:*

Okay. Thank you very much, Louise, for that really terrific presentation, and also Julie for a really good retrospective on how USAID has been involved in this. I know we're going to have lots of questions, and I'm just – I want to start it off with just asking Louise a quick clarifying question. Local markets. You emphasized the importance of those. Are people buying potential seed at local markets, or are they buying something that's being sold as seed, or is it being sold as grain, or both? Just a quick clarification question, and then we'll open it up.

*Louise Sperling:* In some cases you can get certified seed in local markets, but only in vegetable packs. So what they're buying is potential seed, but you see a price difference. If it's the right variety and it's well-sorted, you can get a ten percent difference. So they're buying potential seed.

Now just to be totally fair, in some cases, and – sorry, and traders response to this price markup. So you will find traders who are moving potential seed. They move from one agro-ecological region which is adapted to another. And then, of course, there are the cases where farmers buy grain and then they sort it out to make it better seed. So there are different processes going on.

*Robert Bertram:* Okay. Questions? There in the back? Remember to please identify yourself.

*Male Audience:* Okay. Dick Tinsley, Colorado State University, here in DC for grandparenting duty. My question is, if most of the maize is planted to market seed, should be working with hybrids or composite varieties? And if a hybrid variety gets into the local market system, is that not a disservice to the farmers?

*Louise Sperling:* First of all, just to be clear about the sources for maize, I was just showing the market data comparing two markets. There is also own saved seed and other sources. I think you asked several different types of questions. One is on hybrids, if hybrids go into markets, is that a disservice. There are people in the room who can answer that also, but I think farmers, if given information, make smart choices.

Hybrids are going into markets. Maybe they're planted once or twice again and yield and then they don't yield, so farmers learn. It's just a fact that maize goes in – hybrid maize can go into markets, and others people in the room can comment. But the other thing that you're asking is if maize seed comes from markets, should we restrict – should we limit the types of varieties we put in offer? I think my teams would say farmers have a right to choice, whether it's OPV, whether it's local land raises, and then they make informed choices and buy themselves from markets. I don't think it's our role to limit that choice.

*Robert Bertram:* Okay. Let's go to our virtual room, and then we'll come back to this room.

*Female Moderator:* Okay. This should be better. So we've had a very active conversation on our webinar, lots of people talking to each other and asking questions. This was a question that came out a little bit earlier in the presentation, and I think might be directed to you, Julie, but kind of has broader implications. This is from Lourdes Martinez in Washington, DC, and it was a question about how OFDA works with

different governments, and then other participants were chiming in just in terms of what is the role of different sort of USAID organizations with different governments, and also research organizations, like CGIAR.

*Julie March:*

Good question. We work very closely with government, so when we're planning a response, we certainly would go and talk to the Ministry of Agriculture, all the different aspects of the government in country. We have regional advisors who are based in the field. Certainly any intervention that we would support is based on feedback from the field. And we actually can't intervene unless our assistance is requested, which I think is an important component. We just don't go in and hand out seed. But it is a very involved and cooperative process that involves farmers as well. I mean, we go out to the field. I spend a lot of time today under a tree talking to farmers about their priorities and their choices, and I think that's the way to do it well.

*Robert Bertram:*

\_\_\_\_\_ gentleman in the back.

*Male Audience:*

Yes, thank you both for incredibly thought-provoking presentations this morning. My name is Mike Godfrey. I work for Abt Associates. I'm the senior technical advisor to the food agribusiness and rural markets program, USAID, South Sudan, and I'm just back from South Sudan, and I talked to both of your teams about the following problem.

How do you consider developing a reasonable internal national seed – multiplication seed markets in the context of both the humanitarian and very much a developing context in South Sudan? We've been using imported open pollinated variety hybrids of maize, \_\_\_\_\_, and a particularly well-thought-of variety of bean.

We talked with the CRS teams there about letting them procure seeds through our participants. We work in the equatorial states. So I just wanted to get your – both opinions on how do you integrate this – what you put on the screen, the humanitarian and the development side in the South Sudan context? Thank you.

*Robert Bertram:*

Great question.

*Julie March:*

We could be here all day for that one. I think that's a great question, and it's something that we've thought a lot about. The beginning I think is moving people away from the old model of direct free seed distribution, and figuring out what the willingness to pay for certain characteristics and qualities of particular seeds are.

So really understanding farmer preferences is one, and I think really understanding local market constraints and challenges is another, and we can do that either through market assessment or through seed assessment. I think that's paving the way. I think another model that's been tried quite a bit has been farmer level production of seed, which then goes to market, but again, market assessment is a critical component of that. If we're producing just to sell back to the NGOs to distribute for free, we're really not sustainably creating a system.

So it's something we certainly haven't figured out yet, but we talk about quite a bit, and are looking at all different options and aspects.

*Robert Bertram:* Okay. Let's go back to our virtual room.

*Female Moderator:* Great. This question is from Dennis, one of our online participants, and he was asking what strategies are in place to make seed systems resilient to climate change, especially for crops like cassava and sweet potato?

*Louise Sperling:* Well, there's a growing set of people who look just at seed systems and climate change, and I would refer to – encourage this Dennis to search that literature. Obviously, the things that come up all the time are things like breeding crops to deal with stress, whether it's moisture stress or heat. That is a thrust. But in addition, what climate change means is variability, so it means giving farmers access to a truly varied portfolio from which they can draw when they need it, a portfolio of crops, a portfolio of varieties.

And with that comes also information, so an incredibly refined information system which is twinned with this portfolio. This is a big change from normal seed sector development. Our seed sector development today means a select group of crops, two or three commercial varieties per crop, so anticipating resilience is going to be game-changing for seed sector development.

*Robert Bertram:* Okay. I think there were some up front here. This gentleman?

*Male Audience:* Hello. Brian Bartle from USAID Foreign Agricultural Service. And I was just wondering about the public-private partnerships, if that existed within the seed system assessments. And also, a follow-up question – I'll stand up – on Zimbabwe. I'm just very interested in the black market. What is the black market I guess within the seed system? Is that seed coming in from say Zimbabwe, or is that – I guess I'd like to hear more about that. Thank you.

*Robert Bertram:* \_\_\_\_\_ you, Louise.

*Louise Sperling:* Yeah. First of all, on a seed system assessment, public sector, private sector are equally central. So we look at seed companies, look at their stocks, look at their outreach, look at which crops. We're trying to create – a term I didn't use – we're trying to create integrated seed systems. And just too much jargon in all of these talks. You have to say when am I going to stop introducing new terminology?

But basically, what – a seed system security assessment is moving forward towards integrated seed systems, which they're catalytic points, so you use both. Any – I find – we find the private sector in some ways some of the more innovative in saying, okay, how are you going to reach this farmer in the middle of nowhere? What do we have to do?

*Robert Bertram:* And the black market?

*Louise Sperling:* I don't think I'm allowed to use the word black publicly. The alternative market is one of cross – across the border. Zimbabwe is very near to South Africa, and it's very easy to move supplies by demand. In some cases, alternative currencies were used, whether it's the rand and the dollar. In other cases, barter. How many goats equals how many bags of maize? So how many chickens, how much labor? So there were alternative markets in currency and alternative markets in goods, and there was absolutely no problem with supply.

*Robert Bertram:* Back to our extended audience.

*Female Moderator:* A couple of questions came in specifically about agrovets. One of the questions was from your experience, how to maintain quality at agrovets, and then another one sort of builds off of the previous question about alternative markets. And somebody asked the question about how can we make sure with agrovets that we get seeds from reliable sources?

*Louise Sperling:* There's some important initiatives looking at just the formal sector and agro-dealers and agrovets. USAID is funding some important work here. Obviously, AGRA, the Alliance for the Green Revolution in Africa, is focused exclusively on this formal sector. So I would encourage you to look at their work. On their website, training dealers, looking at their placement, looking at their stocks. It's a huge thrust and a very important one.

Equally, particularly you know this with maize, or what the Americans call corn, fake seed is a huge problem, so you should know that there are a series of new initiatives – I don't know about USAID, but certainly by the Gates Foundation, just to look at fake seed. How do we start to deal with that?

Now what's interesting to all of us is that fake seed right now has been localized to maize, because that's what's really valuable, so you color it green or pink. But if we start to go in small packs with the legumes, fake seed on a policy level and practical level is going to be another new headache. So let's deal with it now.

*Robert Bertram:* This is another area where I think information technologies in terms of barcoding and such to ensure quality delivery, both in seed and fertilizer, I think people are looking into.

*Louise Sperling:* Yeah, and just so you know that on barcodes, which Rob mentioned, this isn't a northern paradigm. Even in Mali right now there's seed experiments selling packs with barcodes.

*Robert Bertram:* Back in this room, Ahmed Kablan?

*Male Audience:* Hi. I'm Achmed Kaplan, Bureau for Food Security. Thank you for this interesting conversation and discussion. The question for Louise regarding the example that you showed, and I agree with you, I hate assumption as much as you do, but in the example that you showed, you also had several assumptions there when you looked at the low – the bad year when the household produced 460 kilograms, and they only need 5 percent of their seeds to save for the next year.

You had the assumption that the amount they produce is enough to feed them and their livestock and others. You have the assumption that they had saved from the year before maybe enough, more, and they did not sell it to use it for other \_\_\_\_\_, such as health, education, and others.

So just if you are looking at it from the numbers they saved, your example is valid, but if you are building in it \_\_\_\_\_, how much they produce, how much they need per household or per person in the household, then your example might not be correct in that \_\_\_\_\_ seed they might still need seed to supplement their feed and to supplement for their agriculture.

*Louise Sperling:* You're 100 percent right. These are just thinking tools, and the first cut is that there should be enough seed, but then you have to factor in reality. What is the time between seasons? Is it two seasons a year or one season a year? Absolutely right.

*Robert Bertram:*

So I've been told we're out of time, but I'm not going to let that stop me from offering a few observations. First of all, I want to just underscore for everybody how important social science has been in this whole endeavor. I think we – this is a case – we talk about it. This is a case we really can see it, and it's very important that we build this into our programs I think across the board, but it's just been so essential to this whole effort.

The question of seed system evolution I think is really out there, and I think, Louise, you used that term integrated systems, and you flagged a lot of things. You flagged the quality seed issue. You flagged the opportunity that these systems afford for actually introducing innovations in terms of the genetics, for example, that we're trying to develop. And I see new opportunities and challenges on the horizon. We have a new seed – soy innovation lab, and Dr. Kaplan is managing that, and soy seed has special issues associated with it because it doesn't last very long, and it's – low quality is a real concern.

So again, to really achieve what it is we're trying to achieve by putting small holders at the center of the soy and livestock revolution in Africa, we really need to solve that seed problem.

The scaling issue. I mentioned that at the outside, and Dr. McMurdy is here. He's leading the scaling team in the Office of Agriculture Research and Policy. One of the big efforts we're doing, not just here in Washington, but in our missions as well, is around vegetable seed. So I think, John, we've got to talk, and we've got to make sure we're working with the World Vegetable Center, a longstanding partner, but we need to be talking with Julie and with Louise and other colleagues about how we can try to learn from what they have been looking at on their side of the house.

Also, this whole – we mentioned information and communication technologies. We have a lead now in the bureau, Judy Payne, on this whole issue of using communication technologies. I wonder if we don't need to give another thought to that in terms of seeds.

And finally, I think this really begs the question this morning of whether we really need to step back, maybe with partners like the Gates Foundation, like the World Bank, and really look hard at how we are going to take advantage of the whole seed system that's out there, from the commercial end – I mean, you heard our speakers emphasize the role of both the commercial and the informal and the connections between them.

And I think this is a gap. I'm sorry Mark Hisinga isn't here, because I know Mark has given more thought to this than anybody else in our bureau, most likely. But I hope as we do this, we can work with you, Julie, and with you, Louise, and with others, to really take a look and see, because our missions, and I hope that we have a

number of mission colleagues on the line, many of our missions are investing in seed systems now.

This is a real change with Feed the Future. For a long time, we didn't have the field-based programs investing in institutions and programs on the ground. Now we do. We also have our regional missions in West Africa and East Africa looking at policy issues around seed systems. So I think the time is ripe, and I hope we can – this is something that we can do as a whole of agency and beyond.

And so thanks again to fantastic presentations from our speakers, and thanks for everybody, both here in the room and in the virtual world.

*[Applause]*

*Zachary Baquet:*

Just before everyone goes, there are evaluations on your chairs. If you would, take a moment to fill those out. We greatly appreciate that. The recorded event will be available on Agrilinks. If you registered for the event, we will send you an email letting you know when it goes online, but otherwise, please take a look and check it out. You'll find it there. Thank you again for joining us today and have an excellent time.

*[End of Audio]*