

# MARKET-BASED AGRICULTURAL TECHNOLOGY SCALING IN FRAGMENTED MARKET SETTINGS: THREE CASES

---

## PRESENTATION AUDIO TRANSCRIPT

**JUNE 10, 2020**

### PRESENTERS

*Julie March, USAID Office of Foreign Disaster Assistance*

*Joseph Dever, USAID Office of Foreign Disaster Assistance*

*Brett Rierson, Africa Harvest Ventures*

*Jean-Baptiste De La Salle Tignegre, World Vegetable Center*

*Nicole Lefore, Feed the Future Innovation Lab for Small Scale Irrigation*

*Suzan Bishop, Livestock Emergency Guidelines and Standards*

### MODERATOR

*Adam Ahmed, Agrilinks*

Adam Ahmed:

Greetings everyone on behalf of Agrilinks and USAID Office of Foreign Disaster Assistance, this is Adam Ahmed, and we will have a presentation today on market pace, agricultural technology, scaling, and fragmented market settings and we will give three cases. Please communicate with us using the chat pod today, and we will take your questions during the Q&A portions of this webinar. I would now like to hand it over to Julie March with USAID Office of Foreign Disaster Assistance. Julie, take it away.

Julie March:

Thank you. Thank you all for participating, especially to our speakers, who my colleague will introduce more thoroughly in a moment. But I'm thrilled to see such a great gathering of people. I think you'll agree that the very notion of market-based agricultural technology scaling and challenging or fragmented contexts reflects a gradual shift of approach to humanitarian response and recovery programming. 10 years or so ago, the use of the market system to support response and build pathways to recovery for vulnerable populations was just beginning to be written into guidelines, experimented with on a wide scale and identified as a best practice when looking at long-term market system health.

Julie March:

I'm sure you're all familiar with the old way of doing things which was direct provision of goods and services, top-down directives and support that gradually over time has been replaced by expanded choice and capacity building for informed and responsive choice at the household level, by the people affected by different types of crisis and context. Many of us remember and still see support that's short-lived and poorly targeted. Thinking about free and adapted seeds, free vaccinations that undermine other commercial enterprises and items like this.

Julie March:

As we look for more ways to support vulnerable populations, by giving them access to what they need to make informed and real-time decisions related to agriculture and livestock production, now more than ever the use of market-based options to reach the last mile are critical. Today we're going to hear about three experiences, market-based mechanisms for scaling hermetic post-harvest grain storage technologies. We'll be looking at assessing opportunities for irrigated seed production, to not only improve nutrition and help with climate risks and water insecurity. We'll also be looking at provision of privatized community-based animal health systems particularly for agro-pastoral and pastoral areas.

Julie March:

I hope that these topics and these speakers are going to encourage even broader conversation and discussion. I think we've made the tremendous amount of change over the last decade or so. I think

we're seeing even more evidence that this is a path to a more sustainable market led future. I'm going to hand it over now to my colleague, Joe Dever, to introduce our speakers. Thank you.

Joe Dever:

Good morning, everyone and thanks for joining us. Our first two speakers are teaming up to talk about irrigated seed production in seed markets. Nicole Lefore of the Feed the Future Innovation Lab for Small Scale Irrigation and Jean-Baptiste Tignegre, World Vegetable Center. As director of the Feed the Future Innovation Lab for small scale irrigation at Texas A&M University, Nicole leads a global interdisciplinary research team to identify ways to scale to agriculture, water management, and small scale irrigation to strengthen nutrition and improve livelihoods.

Joe Dever:

Dr. Tingere is the allium breeding program at the world vegetable center in Mali, where he works on the development of short-day onion varieties, with adaptation to humid and dry seasons. Prior to joining the World Vegetable Center in 2014, he worked for 26 years at the Environmental and Agricultural Research Institute in Burkina Faso as a grain, legume and molecular breeder. Our second presentation today is on private sector, animal health service provision, is Suzan Bishop project and technical officer at the Livestock Emergency Guidelines and Standards Organization, widely known as LEGS.

Joe Dever:

Suzan has over 25 years experience in development and emergency response related to livestock and livelihoods, including 17 years working in the horn in East Africa, where she focused on areas affected by drought and complex emergencies. Suzan has a particular interest in primary animal health systems and community based animal health services. Our final speaker addressing private sector scaling of hermetic storage technologies is Brett Rierson, Managing Director of Harvest Innovations Limited, a social enterprise based in Kampala, Uganda.

Joe Dever:

The mission of Harvest Innovations is to drastically reduce post-harvest losses for Africa's 200 million smallholder families, with the goal of at least 50 million families using hermetic storage at home by 2030. Prior to starting Harvest Innovations led the World Food Programs, Global Post-harvest Knowledge and Operation Center KNOC, which was responsible for bringing the World Food Program success and leadership in eradicating post-harvest losses to smallholder farmers around the world. That's our lineup of exciting speakers. I will now hand it over to Nicole who will make our first presentation on irrigated seed production.

Nicole Lefore:

Yeah, thank you. The presentation I'll do today is on a research study that is in progress. I do have to say that to begin with, because there are some things that we have on pause, let's say while we can't be in the field, but we're presenting what we can as of today. A little bit of context, this project is focused in Mali. What we have, what we are looking at is the lack of nutrient dense foods and how that affects the nutrition of households. Since the 1990s the import of fruit and vegetables has increased tenfold.

Nicole Lefore:

It suggests a high demand for vegetables and fruits, but we also are seeing a lack of seed to be able to produce that domestically. What we're looking at in more detail is how that need and that demand that it continues to grow, could be met through irrigated production. However, this is within a context of weak market conditions. There is a low density market for irrigation equipment, so it's hard for farmers to get it. There's a fragmented seed market between formal and informal markets and production, and therefore reliance on imports.

Nicole Lefore:

There's been a lot of disruption to markets related to insecurity, which can be both periodic in specific geographical areas. Then there are additional agronomic challenges, which can be then affected by the markets for inputs as well as for finance, which is often disconnected. We've done an initial study and this was led by IFPRE based on existing data in Mali. What we found is that, irrigating households consume more nutrient rich food groups, so the nutrition improves through own consumption. They also benefit from higher agricultural income. That's the income pathway to improve nutrition.

Nicole Lefore:

They usually irrigate rice. There's very few that irrigate vegetables, and they find low access to seed and affordable irrigation specifically for vegetables, but also other commodities. In terms of the factors that affect their ability to adopt irrigation, we find education on farm income, participation in farmer's groups and market access, which is a big focus of our study. Currently only about 4% of plots of farmers are irrigated. Our irrigation focuses on household level irrigation. This is what farmers can invest in themselves as opposed to large infrastructure schemes supported by donors, or development partners or government.

Nicole Lefore:

This is just a visual on the pathway to sustainable irrigation scaling. You can see it's a very complex ecosystem. We're focusing largely around the market systems, which is in the bottom left-hand side, but we also recognize that the institutional policy and regulatory context, heavily influences whether that market system becomes more dense and more integrated or whether it remains fragmented. Currently the finance system, the equipment supply chain for irrigation and the value chains themselves, so things

like the inputs, the seeds as well as the output markets, those are all fragmented and it makes it very difficult for farmers as well as other companies to be able to succeed in the vegetable markets.

Nicole Lefore:

There are some other constraints to scaling and a little bit more detail. As I've mentioned, there are localized and national crises, and sometimes that is security, but oftentimes it's also climate driven. It's the lack of water that's regular, reliable, not just during the rainy season, but also through a long dry season. There's also a focus in the formal seed companies, which in itself is quite limited, but it focuses on particular what they call exotic vegetables. They're not necessarily nutrition dense vegetables that are traditional to the area. There's also an informal seed sector that provides seed for the traditional vegetables.

Nicole Lefore:

My colleague from the World Vegetable Center will talk more about that. There's as I mentioned, also a reliance on imported vegetables and vegetable seed, and the reliance on the importation reduces a resilience within the local market, and it increases the vulnerability to conflict and market disruptions. The seed producing cooperatives, which are largely responsible for seed production, do face constraints related to the unreliable rainy season, which is one of the reasons why we're focusing on opportunities for irrigation?

Nicole Lefore:

The focus of this particular study is on the seed system, because seed is such a constraint to vegetable production. We are also looking at this within the context of food security and the food system. We're very interested in how seed and vegetable production affects nutrition, but we also integrate a lens for wash and gender empowerment, because those are quite interrelated to the nutritional outcomes. The study will be assessing formal seed sector, particularly, but also in relation to the informal seed sector. Five priority vegetables that we'll be looking at is the African eggplant, onion, shallot, tomato and pepper.

Nicole Lefore:

Even if in some cases the pathway to nutrition is not through own consumption, because households may only be able to consume so much pepper or onion, we do find in our research that there is a strong pathway through income, and these vegetables do provide those households with a strong income pathway to improve nutrition and livelihoods. The seed sector analysis is doing a situational analysis of the market and how that operates and what that policy regulatory environment is as well, as that currently fragmented system for the market.

Nicole Lefore:

We're looking at where the potential is for irrigation to strengthen the seed supply in particular. We are focusing on where the entry points could be to strengthen that market system, and to have more integration. At this point, I would like to hand over to my colleague from World Vegetable Center who's leading this study in Mali, so Jean-Baptiste I'll hand over to you.

Jean-Baptiste:

Thank you. Vegetable production in Mali. Irrigated vegetable is high performing across seasons. [inaudible 00:13:26] vegetable under dry season irrigation are mostly tomato, African eggplant, hot pepper, shallots, onion, potato and leafy vegetables, vegetable production under irrigation is an alternative to water shortage at critical production phases of vegetable crops. However, vegetable production is affected by low access to seeds, water, markets, losses during post-harvest, storage, lack of information. Vegetable production in my Mali, the role of irrigation in that slide, we just want to show you that within the four months of more than 30 [inaudible 00:14:40] can be achieved on the farmer's field for tomato, when good agricultural practices are coupled with access to water for dry season irrigation.

Jean-Baptiste:

This data was pulled from Africa Rising Projects, USAID funded project implemented in Mali together with [inaudible 00:15:06] and local partners. This picture show some of the irrigation option drip and [inaudible 00:15:25] systems proposed to farmers involved in the best practice hub in [inaudible 00:15:32] region in Mali under USAID Mali scaling projects that ended in 2019. The best practice hub has technology packs equipped with vegetable production facilities to facilitate learning and linkages across the vegetable value chain in Mali.

Jean-Baptiste:

Vegetable seed sector, [inaudible 00:16:08] system exist in Mali and in the ECOWAS region. There is a strong informal system where traditional seed production and supply is conducted, with seeds produced without compliance with seed regulation. Seeds are traded directly to hand or sold in local markets. Next to this system, to this informal seed system, you also have a weak formal seed system. Seed regulation law exists at national and regional level. Recently, effort were made towards harmonizing both regulation systems, or more synergistic action in the region.

Jean-Baptiste:

With this picture without going to details, this picture depicts the general structure of the formal seed system in Mali, showing the capabilities of actual [inaudible 00:17:38] and their roles. There are firstly, [inaudible 00:17:43] including [inaudible 00:17:45], the National Research System and World Vegetable Center, which provided [inaudible 00:17:55] partners. Then we have the regulation [inaudible 00:17:59] represented by the National Seed Service offered by the Ministry of Agriculture. Their role is to train and

also provide seed certification service, and lastly we have production [inaudible 00:18:18] that comprise farmers, [inaudible 00:18:21], individual seed farmers, seed [inaudible 00:18:25] and other actors and also international seed companies.

Joe Dever:

Jean-Baptiste, I'm sorry to interrupt you. Can you just speak up a little bit louder so the audience can hear you?

Jean-Baptiste:

Okay. Very sorry. The issue with seed quality, the major issues affecting seed quality are firstly, lack of knowledgeable vegetable seed experts, breeders, seed regulation, seed regulators, seed [inaudible 00:19:03] et cetera to support quality seed production. Secondly, seed system of vegetable is weak as compared to that of cereals. As you may know, there is no seed company that stays in the region, but starting seeds enterprises funded by AGRA. AGRA is the Alliance for Green Revolution in Africa. There is no quality control for improved vegetable seed by regulators, sorry for ...

Jean-Baptiste:

Excuse me, there is no quality control for import of vegetable seeds by regulator, which sometimes results in safe seed distribution by [inaudible 00:19:53]. Finally, farmers lose out because there's no compensation [inaudible 00:19:58] from low quality seeds. This is a picture taken during a follow-up visit of [inaudible 00:20:14] irrigated [inaudible 00:20:15] led by [inaudible 00:20:17], a dynamic farmer for [inaudible 00:20:20] in West Mali. This cooperative produce more than [inaudible 00:20:29] of certified onion seed per year. They also own onion seed conditioning and packaging facilities. Having said that, I would like to hand over to Dr. Nicole for the conclusion.

Nicole Lefore:

Thank you Jean-Baptiste. I think just in summary, the point is to say that, irrigation actually improves household nutrition through multiple pathways. But that looking at the fragmentation of the market, we see the limitations and how those, that lack of integration in the market decreases resilience and increases vulnerability, but also limits the ability of people to irrigate vegetables and therefore also produce seed for vegetables. One of the things that we are going to be looking at with some private sector companies is, increasing access to both the irrigation equipment and seed.

Nicole Lefore:

I do want to just mention, because there are some questions related to it and I'll mention this very briefly, which is to say that there is a water availability component to this, where we use remote sensing, water accounting modeling and on the ground household level validation of water availability, and those water availability studies consider also factors around markets and infrastructure. We do

suitability mapping related to where water is available for irrigated production. We look at specific crops. We also look at things like agronomic cycle temperature and those types of factors.

Nicole Lefore:

As we move forward, we're identifying specific entry points to support that market integration, by linking with private sector equipment suppliers and farmers. We do that all within a framework for sustainability, both economically and in terms of water availability, so that we don't reduce the water security of households and watershed and basin level. With that, I'll stop there and we can go on to questions or at least, I'll hand over to the facilitators to direct us here.

Adam Ahmed:

Thank you Nicole and Jean-Baptiste. It's fascinating a study that's moving forward and it'll be really exciting to see what the end results of that were. Yes, we do have a couple of questions that have come in. Maybe I'll give one for Nicole and one for Jean-Baptiste. There was a question related to the irrigation canal for Jean-Baptiste. I think it was related to whether that's something that the farmers themselves can achieve or whether that had to be supported with outside funding.

Jean-Baptiste:

I would like to [inaudible 00:24:04]. Let's say that farmers are probably struggling to [inaudible 00:24:13], cannot depend on the rain, because rain, dam waters, rivers, water is available [inaudible 00:24:29] collectively to have irrigation facilities. Like getting low cost water pumps to ease gravity irrigation, or in some places using wells, shallow wells. There are shallow wells that [inaudible 00:24:51] get at least one or two farmers from vegetable production, and they'll they have to stop because the water schedule [inaudible 00:25:05]. What we need to do is to, according to me is to help them with what I call durable production facilities like, instead of using fuel motor pumps based on consumption of fuel, you could help them with systems that use solar power.

Jean-Baptiste:

I think that this kind of system is more durable for them than buying fuel for motor pumps, and other systems where they have deep wells and they have to struggle a lot to get water for the portable water for the [inaudible 00:25:59] and then irrigate their fields, [inaudible 00:26:06] answer to this question.

Jan:

Jean-Baptiste, if you could please speak up a lot louder, the audience is having trouble hearing you.

Jean-Baptiste:

Sorry. Okay.

Adam Ahmed:

Okay. Thank you John Baptist. Now maybe we have one question for Nicole. There was a question from [inaudible 00:26:32], what besides identifying issues and limitations did the Mali project do? It's a multi question here. What are the market based mechanisms for scaling that were undertaken? Is this just a scoping project to define the issues and entry points? Thank you.

Nicole Lefore:

Yes. We're actually in the middle of the project, so this is a little bit premature for us to even be presenting, but essentially what is in progress right now is understanding, first of all the water availability and ensuring that water is available, where the markets are and understanding the crop cycle in relation to water availability. We always do that prior to market intervention so that we don't risk water security. Then the other thing to mention is in terms of the scaling, what we're doing is we will catch up in Mali with the other countries we're working in the region.

Nicole Lefore:

We work with solar pump suppliers who use market based mechanisms. We work with them in terms of developing instruments and tools for them to work directly with farmers, to ensure the suitability of equipment. We look at facilitating linkages to markets. We look at mechanisms such as crop cycles and planting schedules, so that there isn't [inaudible 00:28:02] markets. Basically we try to address some of the market failures by working directly with companies in the context. We also set up platforms where the different, basically linking those different fragments of that market, so that there's better sharing of information and that they can harmonize their tools and approaches in particular geographic areas.

Nicole Lefore:

That is our approach in Mali. It's just that it has, as I mentioned, been paused because of not being able to be in the field at the current moment. Hopefully, we'll be able to get into the field with the companies and directly with the producers soon. We focused here mostly on the scoping and showing where the opportunities are, and what some of those constraints in the seed system market are. Then we'll be working directly in the field with different market actors to try to address some of those issues.

Adam Ahmed:

Thank you very much, Nicole. Okay, maybe now we'll move over to our next speaker Suzan Bishop from LEGS. Thank you.

Suzan Bishop:

Thanks very much for that. [inaudible 00:29:22], I'm going to make a presentation considering how private community based animal health services that assists livestock in communities, can be better

supported by [inaudible 00:29:32] agencies. The presentation draws on lessons learned from professional research project funded by USAID. I'm going to start off by giving a little bit of context on LEGS. LEGS is short for the Livestock Emergency Guidelines and Standards, that share a set of international guidelines and standards for designing, implementing and evaluating livestock interventions to help people affected by humanitarian crises.

Suzan Bishop:

It draws on the experience and processes there, which some of you or many of you may be familiar with. LEGS is based on three livelihood objectives, to provide immediate benefits, to protect livestock assets and to rebuild the livestock assets of crisis affected communities. You'll see there on the right of the picture, a picture of the LEGS handbook which can be downloaded from the LEGS website. Moving on to the rationale for LEGS. The LEGS process grew out to the recognition that livestock are a crucial livelihood assets to people throughout the world.

Suzan Bishop:

Many of who are poor and vulnerable to both natural and human induced disasters, and that livestock support is an important component of emergency aid program. The rationale for LEGS was linked to cycles of often appropriate and badly implemented livestock relief projects, linked to poor analysis, local capacity and services often overlooked or undermined, urgency and timing are often used as an excuse, but the system can arise late even in slow onset drought, and there's frequently limited impact assessments to document lesson learning, and sometimes coordination between the development and emergency sectors.

Suzan Bishop:

Moving on to the aims of LEGS, this is to support saving of lives and livelihoods to two key strategies, help to identify the most appropriate livestock related interventions in emergencies, provide standards and action and guidance notes for these interventions based on good practice. LEGS focuses on the areas where emergencies, livelihoods and livestock overlap, emphasizing the need to protect livestock during emergencies as well as to help rebuilding livestock assets afterwards. It covers all livestock from chickens to large animals, including animals used for transport or draw power.

Suzan Bishop:

It also covers rural communities, farmers pastoralists as well peri-urban and urban livestock keepers and people displaced. Just briefly, the LEGS handbook is made up of nine chapters and two sections. The first section focuses on general principles, decision making and planning. The second section covers the technical aspects of specific interventions, such as destocking, veterinary support, feed supplies, provision of water, livestock settlement and shelter and provision of livestock. The next chapter on technical standards veterinary support, highlights the role of the local private as an essential element in

emergency response and promotes the use of a community based animal healthcare system, including batch of schemes, where markets are working.

Suzan Bishop:

The chapter also highlights the negative impacts that free distribution of veterinary pharmaceuticals can have on the private sector and on the long-term livelihoods of livestock keepers. Anecdotal evidence however, has suggested that donor requirements, the quality and effectiveness are the challenge to implementing that voucher scheme specifically with regard to complying with donor procurement, storage and distribution regulations, to maintain the quality of the pharmaceutical supply chain. To overcome this, the USAID FDA provided funding to LEGS for a two year operational research project, which was carried out in Ethiopia, Zimbabwe and Kenya.

Suzan Bishop:

The research aimed to identifying alternative program models for the application of LEGS standards, while complying with key donor regulations, using emergency [inaudible 00:33:33] voucher scheme. The research model drew on USAID and know FDA pharmaceutical requirements and guidance, and LEGS handbook guidance on community based animal healthcare and vouchers. There were six elements to the research model together with key criteria. The research aimed to test the model of animal health voucher schemes using community animal health workers in Ethiopia and Zimbabwe and animal health service providers in Kenya.

Suzan Bishop:

Veterinary voucher, pharmaceutical supply chain and quality, used also approved wholesalers and licensed PVPs who are able to procure store and supply the [inaudible 00:34:14] pharmaceutical. Community awareness and behavior was critical in this, including community engagement in planning activities around prioritization of diseases, community animal health work and beneficiary selection and pricing discussion. The voucher scheme included elements one to three that ensured good coverage and talks with vulnerable community members, and the vouchers were designed based on consultation with the private sector to determine the appropriate value for delivery of services.

Suzan Bishop:

A monitoring system was set up, which included checking batch numbers, packaging, sourcing of drugs to random inspection of community animal health workers and pharmacists, and included baseline and endline studies with beneficiaries and service providers. But a very key element to all of this is the policy context, and this looked at whether there were appropriate policies in place to support privatized services, and also the veterinary pharmaceutical regulatory policies, including licensing and inspection procedures for wholesale and private pharmacies,

Suzan Bishop:

The main recommendations from the research is showcased in the following slides, according to seven of the LEGS core standards common to all livestock interventions, but you'll notice that there's no core standard for on initial assessment and response identification. This is not included here plus the research. Although the work focused on emergency context, the lessons learned are equally applicable in a non emergency situations as they lay the foundations for long-term sustainable services to be developed and supported. What are the key elements for the robust private animal health services in emergency context?

Suzan Bishop:

Well, moving onto the code standards. The LEGS core one is participation. Community involvement is essential in all stages of the community based animal health projects from initial awareness raising, community animal health workers selection, payment for services and feedback sessions to authorities and implementing bodies. Communities need to have full knowledge of the proposed intervention specifically on issues around service costs and drug pricing, so these can be discussed and agreed pre-Implementation.

Suzan Bishop:

LEGS core standard two, is preparedness and LEGS recognizes the importance of supporting local private sector actors. The preparedness planning recommends building the capacity of communities and existing organizations. The systems need to be in place as part of a functioning privatized animal health factor, to be able to react to emergencies as they arise. In locations where private services exist, the provision of curative services by government staff at subsidized rates can lead to an undermining the emerging private sector, as does the free distribution of some drugs and vaccines by various governments and agencies.

Suzan Bishop:

This issue unfortunately, it's further compounded by the ready availability of poor quality and [inaudible 00:37:11] drugs at low cost. The research aimed to find opportunities for engaging private, definitely pharmacists and private CHWs, but then the system that had long-term potential. In order to achieve this, it required a good understanding of the market chain and demand and supply by all implementing stakeholders, to help the pharmacists and the CHWs orientate themselves as business people.

Suzan Bishop:

The LEGS standard on monitoring and evaluation, emphasizes the importance of establishing effective monitoring systems prior to implementation, and the research findings reinforces points as previously mentioned random inspections based on the live surveys as used [inaudible 00:37:50] systems. Next

core standard three focused on competencies. The standardized national guidelines for competencies have different [inaudible 00:38:01] for frontline animal health providers, allow for appropriate training course content and for refresher training.

Suzan Bishop:

The training course content should also be flexible to allow for priority local diseases to be targeted. Providing business training and supporting animal health service providers to develop business skills, is integral to establishing lots of private services. The training guidelines can be used by implementing agencies to monitor the competencies of HSPs. Although this monitoring should be undertaken by a regulatory body, this often is not the case and implementing agencies, importantly need to understand the legal context and the national standard on the roles and responsibilities of the various cadres of animal health service providers, so that they can provide the necessary support.

Suzan Bishop:

In Ethiopia for example, the government certified standardized training course for supporting documents is available for training community animal health workers. Moving on to LEGS core standard five, this looks at technical assessment and intervention. Well, a few specialists, livestock and animal health NGO is exists, multi-sectoral organizations frequently take on animal health activities. In-house experience and technical skills for both developing and implementing these projects are essential in the concept stage through to the end of the project.

Suzan Bishop:

Where agencies implement community based animal health projects without the necessary experience and knowledge problems can arise, for example, a lack of understanding of the need to avoid providing free treatment, which can need to privatized services being undermined. When it comes to ensuring the quality of veterinary medicine, the role of the regulatory authorities and market chain actors in maintaining the integrity of pharmaceuticals through storage, distribution, documentation practices needs to be assessed.

Suzan Bishop:

There may be need for implementing partners to work with private sector actors to build their capacities in these areas. In addition to this, improved and simplified systems to verify drug quality, so for example, national guidelines, improved importation procedures, complimented by awareness raising and training on the importance of drug quality at all level, and that can include importer, government service providers, communities are often needed to address this issue.

Suzan Bishop:

LEGS core standard five, [inaudible 00:40:20] is monitoring and valuation and the research model proposed a system that was [inaudible 00:40:25] implementation and [inaudible 00:40:27] correction on veterinary drug use management, storage and distribution by all the key service providers, as well as community satisfaction. Key aspects include things like random spot checks and monitoring, and ideally these activities should all be part government regulatory function. However, in many cases, these either weak or absent, and in these situations implementing agencies will need to provide capacity building to help government fulfill their monitoring role in the longer term.

Suzan Bishop:

In the face of poor government regulation, implementing agencies should also take responsibility for ensuring that safe quality pharmaceuticals are used in the project, and should also support good supply distribution and documentation practices by the market actors. Now the next core standard is core standard seven, which is policy and advocacy. The countries where the research model was tested had different legal and structural environments, regarding the delivery of animal health services to rural and isolated communities.

Suzan Bishop:

For example, in Ethiopia, community animal health workers have been officially recognized nationally since the early 2000s, but in Kenya community animal health workers are illegal and frontline services are provided by animal health assistance among others. Community animal health workers schemes often face issues such as a lack of support from local and national authorities, the absence of a thriving private sector and adequate training and limited understanding of the need for cost recovery by communities, who may have been used to free services from government and NGOs.

Suzan Bishop:

CHWs are to provide an effective service, agencies need to advocate to governments at all levels and to professional veterinary bodies, to permit benefits for these services. Giving community animal health workers legal status helps to anchor them within the veterinary service structure, as well as ensuring our national standards and their roles and training. These standards should aim to provide the necessary quality assurance for drug management and use and for clinical services. Finally, moving on to the last core standard, which is coordination and very key.

Suzan Bishop:

Coordination with other stakeholders, including government, NGOs and private sector actors also contributes to improved outcomes. Essential elements of this would include having memorandum of understanding and detailed implementation plans agreed by all parties. These can play a major role in ensuring parties are clear in their roles and responsibilities will improve coordination. An essential is

working partnership with the private sector, particularly pharmaceutical wholesalers and private pharmacies as an essential element in the same sustainability of animal health services.

Suzan Bishop:

Just to conclude, the key points to consider regarding LEGS in this particular context is that, it recognizes the importance of the local private veterinary sector during and after emergencies. LEGS recommends that support be given to local veterinary pharmacists and that community animal health workers be used where available, including through the use of voucher scheme. The use of voucher systems and emergency response has been hailed as an effective and efficient method in areas where markets are working.

Suzan Bishop:

The system [inaudible 00:43:48] targeting vulnerable beneficiaries, and also it supports existing primary animal health service delivery systems. So thank you very much for listening and with that I shall hand back to the moderator.

Jan:

Thank you Suzan.

Adam Ahmed:

Thanks everyone. Before I hand it over to [inaudible 00:44:12], I just wanted to remind everybody that we are taking a couple of questions right now, and then we will have a more general Q&A at the end of the presentation. Joe, take it away.

Jan:

Thank you Ahmed. Yes. We had one question come in for Suzan and it was related to fish farming. The question is from Joseph [inaudible 00:44:35]. Did your project consider fish farming as livestock?

Suzan Bishop:

Hi Joseph, thanks for the question. It is a very good question. Actually, no, we didn't look at fish farming and to be fair fish farming, isn't something which is specifically covered by LEGS. It's considered to be a very, a specialized area and with many different contexts I suppose, which are quite different to other livestock producing systems. In short, the answer is no, I'm afraid.

Jan:

Okay. Well, thank you. That's the only question we had come in for Suzan. Maybe later on folks will send him some more. For now, we'll just move ahead and Brett, over to you, please [inaudible 00:45:23]. Thank you.

Brett Rierson:

All right, thank you very much, Jan. Good afternoon, everyone. I'm a blast. This is the hardest slot as the bar has already been set quite high by Nicole, Jean-Baptiste and Suzan. Also nice to see so many friends online, especially former colleagues from the World Food Program. Jean [inaudible 00:45:49] if you're still listening, we'll give it to you later on, so I hope you have your presentation ready. Just kidding. Some context, for me as this is market oriented, at least for my career, 17 years of it have been in the private sector, 15 years in more public. A lot of it with the World Food Program.

Brett Rierson:

Went to business school, so for me I have a private sector perspective. The message that you'll hear from me throughout this presentation is that in these dysfunctional markets that you need to prime the pump. Similar to what Nicole highlighted to put the control into the hands of individual farmers, not large groups or community projects. No surprise, at least within the post-harvest world, when it's in the hands of women the results are even more impressive. One other overarching point that I'd like to make before diving in is that, at least for post-harvest loss reduction this is not the time to further test efficacy. We know that it works, but the things that we're testing now are different market models. I'd have to say that message certainly has not gotten through to all of the governments at this point.

Brett Rierson:

As we've had fruit and vegetables lead us off, I'm going to focus more on grain, but I'm happy to follow-up with anybody offline afterwards. In looking at, go to the next slide here. Both of these losses the way that we look at it right now, it really is Africa's biggest challenge and biggest opportunity. If you look at the African Development Bank, looking at the market size for agriculture, it's a trillion dollar market over the coming years. Most people don't realize that post-harvest losses are the elephant in the room. They have a greater negative impact on Africa today than conflict, HIV and malaria combined.

Brett Rierson:

Most people don't view it that way. The farmers themselves do it as business as usual. The market for affordable post-harvest loss solutions themselves is five to \$7 billion for the 200 million smallholder families. I got some more information today that that said that number may even be low. But the market is huge, but despite this market size, the proven demand, proven impact on families scale really has not been achieved yet. Frankly, the question is why? The next slide looks at something that again, I'm surprised that in many of the presentations that I've made over the past four or five years across Africa, that people do not understand yet the very simple technology.

Brett Rierson:

It's a complex technology in terms of oxygen not being able to permeate these bags or plastic silos. But the way it works is pretty easy. If any of you are out there willing to try this right now, just hold your breath. Because if you hold your breath until you suffocate, you'll understand how these bags work in terms of eliminating the insect infestation in the grains and stored grain. Even in very clean grain, you're going to have insects that I've already laid their larva on the inside and they'll hatch. But we've seen repeatedly is that and this is again, not needing to test efficacy anymore, is the insects suffocate on their own CO2.

Brett Rierson:

Then after that, the hermetic storage units can be opened on even a daily basis if needed. There was an occasion in Rwanda with GrainPro one of the major manufacturers of hermetic products, where they had hermetic ... they had maize and cow peas stored for 12 years. If you're interested, just go online to YouTube and look 12 years in Rwanda. Interestingly enough, even after 12 years, the germination rates were still quite high. Again, the picture speaks louder than words. That's cow peas after 90 days and the technology simply works. Again, this is a simple, scalable, affordable solution, and this is not something that's new.

Brett Rierson:

It started back in 1982, funded by the Swiss [inaudible 00:50:11]. What my work has been across right now, 16 countries in Africa, as well as work in China and some other Asian countries is that, consistently losses are brought from over 40% to less than 2%. That is across pretty much every crop group cash crops, as well as staple grains. I think importantly, a very effective control or elimination of mycotoxin or aflatoxin contamination, through the use of simple drying [inaudible 00:50:42], and then something as simple as a salt in bottle tests to test the moisture content of the grains being stored.

Brett Rierson:

But I think it's important to stress that, it's really outcomes for these farming families that's more important than the output. All right, it's not just about saving grain consistently a two to three times income increase, sustainable food security for these families, health and nutrition impacts that have been very clear and shift of power really into the hands of women. This has been backed up repeatedly. There was an MIT assessment that was done for USAID in Uganda, and you can see the results there. Some of the more interesting research that's going on right now has been by ETH Zurich, Mathias and Michael, the team there in Tanzania there with 1,000 families; they had a 38% reduction in food insecure families within one harvest.

Brett Rierson:

Right now in Kenya, they have a random control trial going with 10,000 families that are looking at further detailing, what are the impacts on income and nutrition and specifically, and interesting now how in a period with COVID-19 impacting some of agriculture in this part of the world, in all parts of the world, looking at how this has actually made the families more resilience and a resistance to any of those market pressures. Again, the market based solutions themselves again; I express my private sector background.

Brett Rierson:

They sound great, but frequently in what I would describe as pretty dysfunctional markets, the lack of price transparency at least what I've seen people do have mobile phones in many rural environments, but I think their use is vastly overstated. Whether farmers are willing to use them in terms of the data charges, which again, I compare it to when I lived in China or in Asia, the data charges in Africa are still enormously high comparatively speaking. The weak supply chains in terms of delivery of these hermetic products, lack of incentives to actually save the grain if you can't get your stuff to the market, huge issues with corruption still.

Brett Rierson:

Interestingly, the entrenched power structures give you a specific example. Uganda Grain Council was actually telling farmers not to use hermetic storage, because most of the people in that grain council are the rich farmers themselves, and they don't want to see a shift in market dynamics because it benefits them as opposed to these many, many smaller farmers, because it really does shift the control of the market pricing into the hands of the farmers. The last point that I put on here, competing ideas from donors.

Brett Rierson:

I have never in my 30 year career, private and public sector has seen anything as impactful, if you want to invest in seeds, if you want to invest in irrigation and 30% of your crop is lost or 40% is lost to post-harvest losses, then that undermines that as well. But there's so many competing ideas from donors that that's also in the marketplace of ideas, that has been a challenge. What are the things that actually work right now? What are these options to overcome these dysfunctional markets? AgResults, I think is a particularly interesting example. I'm not sure if everybody's aware of that.

Brett Rierson:

This was, they had a variety of different things across Africa, but for post-harvest in Kenya a couple of years ago, they had prizes to incentivize the private sector to develop their supply chains. Now, they handed out \$6.2 million worth of prizes. It costs around \$5 million from what I understand to implement. The thing that works for this, and they tried several different models in Kenya, but I'll give you one specific example. AgroZ is one of the major manufacturers of hermetic bags globally, and

especially here in East Africa, they're based in Arusha, Tanzania. As a follow-up to these prizes that were awarded in terms of directly related to sales ...

Brett Rierson:

This is what I mean about priming the pump. They've sold a half a million hermetic bags so far in 2020. This is a threefold increase from 2019. Yes, it takes a little bit longer for them to get raw materials, but their business is going good even with the lockdowns with COVID. They did invest in the five layer multi-ply machinery and have a capacity to do five million bags annually right now. They're looking at 11 countries Tanzania, Zambia, Uganda, Ethiopia, Mozambique, Rwanda, Ethiopia, to the name a few. They view AgResults as one of the, as fantastic.

Brett Rierson:

One of the things that was good for them from their perspective, what that USAID and the team from AgResults actually dealt directly with the manufacturers themselves. Several of the other companies GrainPro used Farm Concern International. A company named Elite was also involved. They didn't really invest in their own distribution networks, but used NGOs, and that was found to be much, much less effective. But so I think things like this can work. Interestingly when I was at the World Food Program, we used discounts or subsidies and that's been interesting. As soon as you say discounts to donors, they're very happy about it.

Brett Rierson:

The moment you say subsidies, which is effectively the same thing, people would get all up in arms and say, "This is ruining the market incentives." It was actually a slightly cheaper per farmer to do this than the AgResults model, but AgResults model led to more of a long lasting distribution network, because the company has invested in this to win some of this prize money. Another example is [inaudible 00:57:02] Digital, which is a Ugandan company that I've worked with, where they actually had, again, incentives, discounts, and the system there and the reason why that made the dysfunctional market work better is that, they had an online system and it worked offline as well.

Brett Rierson:

It's important in Karamoja, one of the more remote parts of Uganda or anywhere in Africa, and one of the least developed, where you actually had the companies in the same system as the distributors and the moment that the distributor got paid, there was a split digital payment that was done, and it immediately paid the suppliers of the products themselves and that worked pretty well. I think Jumbo from Vestergaard, Vestergaard is now making a single-ply hermetic bag that is working very well. It is a drastic reduction in price. The AgroZ bags costs about two and a half dollars.

Brett Rierson:

I think GrainPro is about the same for a hundred kilos of storage. Jumbo system uses these less expensive bags, but also links them to a local entrepreneur with an online platform. One other point I put here is this establishing hermetic standards. This has been a challenge. The East African Grain Council made a good effort at it, but just as an example, Malawi wants to set up their own testing. It'll take about a year to do the testing. Instead of using bags that absolutely work, have been tested by global standards, PICS, GrainPro.

Brett Rierson:

Everybody knows that they work now, but these hermetic standards that have been established are not widespread yet and that really has been a challenge. Again, that and border controls really have been an issue. Very easy for AgroZ to get products into Kenya, but it takes up to six months for them to get the same shipment into Uganda, simply because the government continues to ask questions. Very briefly, and then I'll conclude. What has not worked, building large-scale collection points and counting on structured demand really has not worked. There's been a lack of management there at the local level and in some cases lack of ethics.

Brett Rierson:

The flavor of the month, you had major donors like the Rockefeller Foundation go heavily into post-harvest for about two years with YieldWise. Then there was a change in management and that has pretty much ended right now, which is really tragic because it really did get a lot of things going very quickly. One thing I'd love to see work, but haven't seen it effectively implemented yet is leased loan, where either the major private sector companies do a provision of these products. We've looked at this with Nile Breweries, with [inaudible 01:00:07], with some of the other larger industries here in East Africa.

Brett Rierson:

But the lack of respect for contract law has put that ... So far we haven't seen it work effectively. Again, I think that this needs to be a private sector led activity, but the priming of the pump is really important. Very briefly what we've been doing is a training of power users, nudging of the private sector in terms of profitable supply chains, because to me sustainability means profitability. Then I think it's still important that there's effective monitoring and evaluation, because be it governments or be it donors themselves, they're still not aware of the potential impact that this has.

Brett Rierson:

That's why I'm really excited about the ETH Zurich work that's ongoing. Then lastly, how do you take this to scale? To me, that's the mass scale behavior change campaigns, similar to what was done with HIV or malaria or quite frankly with Coca Cola, how do you make this a consumer product that is of interest for aspirational consumerism? I think that to me has is where the greatest potential is. Again, our target is

see 50 million adapt good practice and purchase this equipment, and create this, be an awareness catalyst for these 200 million smallholder families. If I would ... Oops, sorry.

Brett Rierson:

Just to look at it in terms of a larger scale, how much does this cost to end post-harvest losses on an African scale? We've looked at it country by country in terms of what we were previously doing with the World Food Program and some other organizations. At this point it's only 655 million over the next 10 years to really, ending is probably a bit of a stretch, but to drastically reduce post-harvest losses. I can tell you that's over, that's just about \$3 per family, which quite frankly would be I think a good thing to invest in.

Brett Rierson:

I'll leave you with one final thought is conversations that I was having with AgroZ in the past week. They look at it right now as a market in East Africa alone of 300 million bags over the next 10 years. That is, that's \$750 million of market in East Africa alone. When I talk about how big this market is, I may actually have understated it. Just one final slide, if you look at what happens in terms of post-harvest loss, I stress what happens in terms of women and their empowerment. But this impacts poverty, this impacts water, this impacts hunger. There's of course Champion's 12.3, which is reducing post-harvest losses.

Brett Rierson:

Again, if you look at, in terms of where the biggest impact in terms of climate change, right now, post-harvest losses trail only China and the United States in terms of climate impact. One relatively simple solution just has this massive cascade effect across the STG. That's it for me, I'll hand it back over to the moderator. Thanks for your attention and for hanging on and happy to take questions.

Adam Ahmed:

Thank you, Brett. Yeah, it definitely generated a lot of questions coming in. That's exciting to see. We'll ask you a couple of questions and then we'll go around and start asking some of the other speakers as well as various questions that have come in as well for them. Here's one that's quite relevant now, because it's related to COVID-19 and this is from Malika [inaudible 01:04:07]. COVID-19 pandemic demonstrated the importance of preventing food loss. Did you develop low cost technology for fruits?

Brett Rierson:

In Burkina Faso as well as in Mali, we were working with several companies there that were using convection, and it was focused on Irish potatoes as well as sweet potatoes as well as tomatoes. Tomatoes, we managed to get up to about five weeks of usable life beyond what the normal period was, and for sweet potatoes and Irish potatoes, we were looking at five to six months with some very basic

convection technologies, using natural air flows and traditional methods. While these hermetic bags are pretty sophisticated, some of these things we did for fruits and vegetables, were much I guess I'd say much more traditional, but certainly effective.

Brett Rierson:

The other thing that we saw with these hermetic bags is, we did actually see people chipping and drying some of these vegetables specifically potatoes. We also saw that with cassava and then drying it to again about 13%, relatively easy to test with the salt and bottle, salt and the bottle method. We saw those also be able to preserve for months and months and months afterwards. Next question.

Adam Ahmed:

Okay. Thank you. Oops, the system jumped up. You mentioned the example of the 12 years, and so we have a question from maybe Mohammed [inaudible 01:05:56], who says 12 years then how long was the dormancy period for the seed?

Brett Rierson:

I think that's an excellent question. What had happened was there was a change in personnel in both the company, as well as the government. Nothing to do with the genocide or anything like that, but it was simply people forgot about it. Then when they did the test with germination afterwards, and again, even the 12 year there were effective good germination rates. But I think that's an exception to the rule. I don't think any of us are going to recommend storing for 12 years, but the hermetic storage both in the silos, there was a picture I had in the slide presentation of the factory here with [inaudible 01:06:47] plastics, thinking plastic silos, metal silos, which have started.

Brett Rierson:

WFP started to use them in their school feeding programs to reduce losses. Even the ... Any of these products, any of these solutions, the germination rates were frequently higher than the traditional grain that was stored, simply because there was not any use of phosphene or anything else on them or they didn't have the impact of the insects. The germination rates with hermetic storage, it remained very, very high.

Adam Ahmed:

Adam Ahmend:Okay. Thank you. Then one more question for you before we move on to some of our other speakers, there's a question from Dick Tinsley. Are you anticipating the hermetic bags will move up the value chain with the farmer paying full cost, or will the grain be repacked when sold so the hermetic bag can be reused at the farm level?

Brett Rierson:

I think that's an excellent question. I was actually hoping you were going to ask that because I could see that on the screen here. From what has happened, AgroZ with two and a half dollars per bag there is ... The economic return to the farmer is so high. Again, initially they're saying, well, it costs me \$2 for a pee pee bag or a dollar for pee pee. Why would I pay more? Because they don't understand that market timing issue initially. After they see their neighbors and again, the bag opening ceremonies and letting, saw a comment earlier on the chat group from Pete about doing community work at a time.

Brett Rierson:

I think that's excellent. Is that the bag opening scenarios and proving that it works first and people seeing with their own eye, at that point they were the ones who were buying and at that price point at two and a half dollars. Now again, Vestergaard and the bags that they have, the ZeroFly bags, now they have some with insecticide on the outside and some, because they've realized hermetics works so well without that, that's also bringing that price point down. That's worked as well. Just one last example, I think the best case scenario.

Brett Rierson:

This is where for example, some of these grain councils, actually they're certainly not working on behalf of some of the smallholder farmers is, if you were to keep the grain in the bag all the way to the market or in the silos, then that eliminates the need for some of that processing. A specific example for that with cash crops in Ethiopia, GrainPro ended up working effectively with the government and changing the testing procedures, so that the bags were no longer punctured to test to make sure what was inside, but they opened them up, tested, re sealed them and then you have GrainPro now they have full containers of hermetic, container size for hermetic bags or at the 100 kilos level, that bag would go all the way to the doorstep of the coffee shop in Europe or the US without being opened.

Brett Rierson:

Again, that value chain question that Dick asked is a very, very good one. There are workable examples that are already out there. This is specific for cash crops for coffee for Ethiopia. Why other countries don't do that yet? It just never ceases to amaze me. Thank you for the questions.

Jan:

Thank you, Brett. I have a couple of questions I thought maybe we could ask to Suzan now. One is from [inaudible 01:10:34], and it's related to community animal health workers. As community animal health workers are not legal in Kenya and other countries possibly, how did LEGS work around it?

Suzan Bishop:

Okay, thanks for that question [inaudible 01:10:52]. I think I might call on my colleague, Simon [inaudible 01:10:55] who is actually worked with me on the project, and is actually yourself as he may be better placed place to answer that question. Simon, are you able to do that?

Simon:

Thank you very much. Yes, Suzan. In the case of Kenya's situation whereby the community animal health workers are not legal, what we did was to actually engage other service providers, who are either certificate level, diploma or degree level veterinarians in the community, who work within the community and probably while doing private work. These guys who are now brought up together and actually engaged within the project as some of the service providers.

Simon:

In Kenya, this is where also tested the e-voucher system, because as you know these service providers of high caliber are very few, so they may not be strewn across the pastoral communities, and therefore the communities had to call them and the e-voucher works very well for that purpose.

Jan:

Thank you, Simon. We have another question also, for based on livestock and for Suzan. Sorry, my little screen here. This is from [inaudible 01:12:22]. Do you think of other embed services for the community animal health workers?.

Suzan Bishop:

Okay. Thank you [inaudible 01:12:32] for that. I'm assuming, I'm not sure whether you mean in terms of the wider context outside and delivering animal health services. I'll look at both elements. In terms of delivering animal health services, the community animal health workers would be providing advice and follow-up services, as well as the actual clinical diagnostic and treatment services. They would be, because they live within the communities, they are there to provide advice on an ongoing basis and then to revisit the cases, to see how things are going, and also provide advice on a wider production basis, I guess, not specifically related to a particular case.

Suzan Bishop:

But I know there's a lot of discussion about how you can involve community animal health workers in supporting other services. It's very much in the frame of the one health situation. How can you link them into working with the human health sector? I know this has been tried over the years and in some context it's still being tried. It is a complex area because if you're looking, you're looking at trying to link I say the private system, which is what the animal health services are aspiring to be to a public system, which is often the case with what community health workers would be.

Suzan Bishop:

It's like sometimes where it's quite difficult to find a system and a structure that actually works well. But it is an area which has been explored in different parts of the country. It's not something that we looked at in a particular operational research model however. Thank you.

Jan:

Thank you, Suzan. I have a question here for Jean-Baptiste and this is from [inaudible 01:14:09]. How can the seed value chain be improved to reach the final user in time, easily and cheaply. John Baptist you might still be on mute. Not carrying anything, Nicole, but would that be something ... Go ahead.

Jean-Baptiste:

Can you hear?

Jan:

Yes. Now we can hear. Yes, please speak up a little bit on that piece.

Jean-Baptiste:

Okay. I am saying the best way to achieve this would be to improve access to seeds instead of using the distance farmers should cover to get seeds. In some cases, for instance for vegetables a variety, we have tested on the demonstration field. Farmers are happy of the [inaudible 01:15:48], the varieties. But to get these varieties they travel something like 400, 300 to 400 to get the seeds. This is a bottleneck really we need to end. To be able to do that, we need to get enterprises located at farmer's places, or at least getting some seed farmers in the village, the close vicinity of the village so that farmers can access the crop varieties on time and easily.

Jean-Baptiste:

That's one [inaudible 01:16:40]. Another way is to as I said there is no seed company in West, in Mali, that's it. You have starting seed enterprises and they need to be strengthened, so that they can improve, they can increase the quantity of seed so that they can be disseminated to more area in Mali for instance. That's two key points I think we can tackle to avail more seeds to farmers in Mali.

Jan:

Okay. Thank you. Then I have another question for you Jean-Baptiste related to the irrigation. This is from [inaudible 01:17:35]. The question is, is the drip irrigation system that you've mentioned solar powered.

Jean-Baptiste:

Oh, okay. Yes. One of the picture I show, I took it from best practice hub implemented by the Mali Scaling Project. In that project for the best practice hub, the irrigation facilities were provided by the project and they deal with solar power. They have borehole equipped with solar panel that provide, supply water to all the [inaudible 01:18:31]. Both [inaudible 01:18:31] and drip system are benefiting from the solar power system. Hello.

Jan:

Yes, [inaudible 01:18:51].

Jean-Baptiste:

Did you get my answer? Hello.

Jan:

Yes, I think we got it. Thank you Jean-Baptiste. I have a couple of questions here now for Nicole. One also is from [inaudible 01:19:11] and her question is, what steps have been taken to scale irrigation?

Nicole Lefore:

I think as I had mentioned earlier in the presentation that we are in the middle of this project. In terms of the scaling part, we haven't really started to test different business models. But essentially the approach is that we do the baseline research and we look at water availability, and suitability mapping to figure out where this is even possible. Then we work with a number of partners across sectors, and bringing them together to look at the range of tools, and the range of tools that are available to them.

Nicole Lefore:

Some might be apps. Some may be other types of tools that enable an assessment of water resources and markets. But essentially by bringing those together into a dialogue, where they can start to tackle issues together. That's part of the approach. We also do business model development. We do market assessments, cost benefit assessments and then we look at business models that might work in that particular context, and considering both the existing and more ideal scenarios policy.

Nicole Lefore:

The scaling approach is actually done primarily through the private sector partners, and we play that role of facilitator and helping to set up that engagement between different actors and across the sectors. And much like what Brett had said, this is a situation where you have to prime the pump. You have to support market density and that market intensification for irrigation equipment suppliers, to

make it more accessible to the farmers, and to de-risk that investment in expanding markets by the private sector actors. There's a lot of different pieces in that pathway to scaling.

Nicole Lefore:

Business models are one approach that enables us to try to look at those different pieces, and the dialogue process is helping to bring those pieces together. In Mali we're quite early in the process. But we've been working on this in Ethiopia and Ghana for a number of years.

Jan:

Thank you, Nicole. Maybe a little bit of a follow-up related to that question from [inaudible 01:21:51]. He says, "What are the economics of irrigation facilities and are there subsidies involved?"

Nicole Lefore:

Right. It depends on the type of irrigation you're talking about. Usually it's not a direct subsidy to a farmer, but oftentimes the big irrigation schemes are built with public funds, and sometimes the smaller households and farmers in the area will, what's the term, piggyback on those structures, even if they're not part of that formal scheme. It's not a direct subsidy in that sense. In terms of the private sector companies, it's not also again; it's not a direct subsidy as such. There's ways that they can get access to funds that de-risk their investment.

Nicole Lefore:

Particularly if you're using solar irrigation and solar pumps, you can tap into certain funds that reduce the risks for the companies who want to expand into frontier markets and to higher risk markets. The other aspect of this that we see that it tends to be quite successful again, it's priming the pump. It's supporting market density in particular geographical areas. It's not necessarily providing a subsidy to a farmer or to a company, but linking farmers with sometimes produce buyers or NGOs, who will help with a down payment on pumps.

Nicole Lefore:

Normally farmers don't have a problem making the regular payments, but to help them make that initial payment for the, to get access to that pump and other equipment to begin with. We don't see a lot of direct subsidies, but we see these other ways of de-risking and providing indirect support

Jan:

That's great. Thanks very much, Nicole. Then maybe just a couple last questions for Brett here. We've got one from Joseph Molnar and his question is, what's the ecological impact of all these bags and in brackets, I think they're worth it on humanitarian terms. What about Rwanda and bags as an example?

Brett Rierson:

Actually, I saw that question as well and responded briefly in the chat group, but just for everyone's benefit, what we found these bags are not single use plastic. They are used for a minimum of three, usually four to five harvest if they're taking, and that's been consistent across all of the bag manufacturers. That's AgoZ, that's GrainPro, that's Vestergaard. Elite was another company that was doing things here in Kenya as well as PICS. PICS is the one that got this all started, but the other thing I think that's interesting to note is that, in my years of doing this, and again, 16, 17 countries across Africa, I've not once ever seen a single bag on the roadside, because this is very high quality plastic.

Brett Rierson:

It is repurposed afterwards, either as roof lining or installation or storage for household items, clothing, things like that. The environmental impact is a good question. But yes, I agree. The impact of preventing food insecurity I think is a value in itself. Then even more promising is Vestergaard has been looking, I believe in Nigeria to start with Ethiopia, they are recycling their bags as well as other forms of plastic, and starting to invest and wanting to invest on the African continent. You are starting to see the bag manufacturers themselves being able to advance their own technologies up to where they are recycling. But good question, Joseph.

Jan:

Thank you, Brett. Let me just, a little slide it across, and then we also have the question from, another question from Dick on what is the salt and bottle method that you mentioned?

Brett Rierson:

Ah, okay. I've also put a link in the chat group for everyone in response to that. Salt is hygroscopic, it absorbs moisture and grain, if you put a grain into a, take any glass bottle. My current favorite would probably be Nile Special. But any glass bottle that you take, if you put a tablespoon salt and about one third full of grain and you shake it for minute, the salt absorbs the water and it sticks onto the inside of the glass. The moisture is above 13%, and you want to store most grains at about 13%. Instead of buying a \$400 moisture meter that you need to then spend a lot of money on to calibrate every couple of years.

Brett Rierson:

I think that a better choice for most of these smallholder farmers is simply any bottle that's lying around, clean and dry with a little bit of salt and you have yourself a very effective moisture meter. The video is there, produced by Sabo in the chat room.

Jan:

Thank you very much, Brett, over to you Ahmed.

Adam Ahmed:

Thank you everyone for joining the webinar today. We are approaching the end of the webinar, but thanks for sticking with us. I'm going to change the layout of the room to reflect the poll questions. Please answer those on your way out. We also have some resources for you to check out. It's been a pleasure and we hope that you join us next week for our webinar on supporting the management of Fall armyworm in Africa and Asia, best practices and lessons learned. It's been a pleasure. Thank you so much. We'll see you next week.