



# FROM LAB TO MARKET: SUCCESS FACTORS FOR COMMERCIALIZING AGRICULTURAL TECHNOLOGIES

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PRESENTATION AUDIO TRANSCRIPT

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## PRESENTERS

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## MODERATOR

Julie MacCartee, USAID Bureau for Food Security

*Julie MacCartee:* Good morning, everyone, and good afternoon or evening to those of us who may be joining us on the webinar from places across the globe. And welcome to our December Agrilinks seminar, which will be launching a new report from the Feed the Future Partnering for Innovation program titled Success Factors for Commercializing Agricultural Research.

My name is Julie MacCartee and I am a knowledge management specialist with the USAID Bureau for Food Security. And I am the usual host for our Agrilinks seminar and webinar series.

And in case any of you are not highly familiar with Agrilinks, it is Feed the Future's technical knowledge sharing platform, manifested as both a website, Agrilinks.org, and also a monthly seminar-webinar series. Typically we hold them as webinar-only, but we are excited to have an in-person audience today as well.

So before we get started with the content, I just wanted to provide a few reminders. First, for those of you in person, please remember to silence your cell phones so as not to interrupt the speakers. Second, this event is being recorded. So you'll all get an email after the fact with the recording if you would like to share it with your colleagues. And also for the recording we'll be passing around a mic during the Q&A session to make sure that those get recorded. The mic-passing is also for our webinar audience so that they can hear the questions and answers in the room. So in that regard we generally ask that you wait and hold your questions and answers until after the main presentations.

We've got a few surveys on your tables. That's just a quick to before you leave today to fill your surveys, which help us improve our events for the future.

And let's see, I think that is about it. So we're going to go ahead and dive into our content. I'm excited to introduce our first speaker, who will be providing an introduction to the content and to our other speakers. And that is Aviva Kutnick, who is a USAID foreign service officer and ag development officer, and who is the USAID activity manager for the Feed the Future Partnering for Innovation program. So I'll pass the mic over to Aviva.

*Aviva Kutnick:*

Great. Welcome, everyone. Again, nice to have everyone here in person as well as those on the webinar.

I am Aviva Kutnick, and I work at our Bureau for Food Security's Markets and Partnership Innovations office. And today we are so pleased to be releasing and discussing this new report. Copies are available online and at the table at the entrance of the seminar hall, which is *Success Factors and Commercializing Agricultural Research*.

I'm going to start off by sharing a bit of the background as to why USAID commissioned this report in the first place and why we are so excited about it.

This is part of Feed the Future and the global food security strategy which aims to sustainably reduce global hunger, malnutrition, and poverty. And one of the ways we are doing so is through inclusive and sustainable agriculture-led economic growth.

Now, we all remember from our econ101 classes that technology improvements is one way to move out that growth curve, to make farm work, labor more efficient, and investments – capital – more productive. Further, as development practitioners here in the room and on the webinar and elsewhere, we want this growth to be both inclusive and sustainable. Ultimately that poor household see and feel the long-term social and economic benefits.

The report and then the discussion today will also represent a meeting of the minds between both experts from private sector, engagement, and market facilitation, as well as the research community.

As we know, USAID invests millions of dollars annually in agricultural research. And these investments have the great potential to profoundly impact food security around the world. And the driving question that bring us here today is how can we get more of these ground-breaking technologies into the hands of more and more users?

Recently USAID released a global food security research strategy which frames the Feed the Future research programming as an R&D pipeline in which innovative, scalable products and practices progress through various stages of research ultimately to be transferred for dissemination and use.

So this report today and our discussion is part of our effort to better understand one of the pathways for this widespread adoption; the commercial pathway.

Once we have identified appropriate and scalable technologies and then how we can productively involve private sector partners who will ultimately take on the dissemination and scaling in the marketplace through that commercial pathway.

So here at USAID we are experimenting with various private sector engagement models, one of which is the Feed the Future Partnering for Innovation program, which helps commercialize agriculture technology into smallholder markets through partnerships.

In this program we partner with commercial firms to demonstrate, produce, and disseminate these agriculture technologies. And if it's profitable for the firms to do so, they'll then incorporate it into their long-term company's growth and marketing strategies, which in turn will make the technologies more available and accessible to the smallholder producers, post-harvest traders and processors in order to reach the goals of the global food security strategy; to reduce hunger, malnutrition, and poverty.

So now on to the report, *The Success Factors for Commercializing Agricultural Research*. We examined eight USAID-funded partnerships under the Feed the Future Partnering for Innovation activity between university and international research institutions who developed the agriculture technologies and those partnerships between private sector who then bring the technology to market.

We'll look at several examples including orange fleshed sweet potato and legume inoculants today.

And before we get started, I will also mention that this is not a comprehensive study of all best practices of all publicly-funded research. Rather it's a starting point to spark discussion about good practices for how we can get ag. research to best reach most users.

And with that, I'll turn it over to Virginia, our main presenter today, to present the findings of the report. Virginia brings considerable experience coordinating government officials, private sector companies, donors, NGO and research institutions to bring innovations, particularly in the cocoa production and processing sector, to market where she worked as director of research as well as regional programs with the World Cocoa Foundation.

After that we're going to turn to a first responder from the Feed the Future Innovation Lab, the Horticulture Innovation Lab, Erin McGuire, the deputy director of that innovation lab. And she'll provide some first responses from the phone and the webinar.

And then we'll turn in person to HavestPlus, to Anne-Marie, director of external affairs, and we'll hear from her. So I am going to turn it over to Virginia now to get us started with the report findings.

*Virginia Sopyla:*

Just get to the first slide. So this morning I'm here to present our recently-released report entitled Success Factors for *Commercializing Agricultural Research, Lessons from Feed the Future Partnering for Innovation*.

This report specifically focuses on publicly-funded agricultural research that is being commercialized to benefit smallholder farmers. And the emphasis is really on the interaction and relationship between the research institution and the company during that handoff and commercialization process.

It kind of picks up at the point where the research is complete, the decision to commercialize has been made, and it's now time of the process to get started.

So first, briefly a few words about partnering for innovation. This is a USAID-funded project that supports the private sector in scaling and marketing

agricultural technologies, commercialization, and knowledge exchange. It also helps to facilitate partnerships between USAID missions in the private sector and also provides some business accelerator services.

As you can see from this slide, the program has over 50 partnerships in 17 countries. But for purposes of this study, we focused on eight of those partnerships, most of which were in Africa.

So why research to commercialization? Why look at this topic? Well, as Aviva mentioned, significant public sector resources from USAID and others go into supporting agricultural research. And we know that commercialization is one of the important pathways for transferring that technology to smallholder farmers. And however, we see that sometimes that happens, and sometimes that doesn't.

So we wanted to look at the experience of Partnering for Innovation in this space, look at some of the projects that are working specifically on commercializing agricultural research, and see what lessons learned we could gather from that. What are some of the key factors for success? And then look to share those with researchers and with donors that are looking to be active in this area with the idea of sparking a broader conversation and dialogue with stakeholders around this topic.

So we look forward today to sharing some of those lessons learned with you and also to hearing some of your experiences and your ideas around this topic.

This study was qualitative in nature. It was based on interviews with companies and research institutions that are participating in Partnering for Innovation projects. We also spoke with several external experts and then supplemented that with the literature on this topic.

The report, as Aviva mentioned, is currently available online, on the Partnering for Innovation website, as well as Agrilinks. And for those who are here in person, we do have some physical copies outside.

The report begins with a brief overview of the commercialization process, which I'm not going to get into in today's presentation. It then goes through eight success factors detailing a bit about these and using some examples from Partnering for Innovation experience. We then have a brief overview of some broader lessons learned from this work and some ideas for future considerations for those who are looking to engage in commercialization. And then at the end we have a series of case studies looking at four specific Partnering for Innovation projects that we think best capture some of these success factors.

For today's presentation I'm going to walk through the eight success factors using in particular one case study around a product out of Kenya. I will then provide a brief overview of some of the lessons learned and ideas for future consideration. And then we're going to devote a fair amount of time today to discussion and sharing experiences. We very much look forward to hearing, particularly from those of you that may be involved in commercialization from other perspectives, whether that's some of the innovation labs or CGIR centers or other institutions. We would love to hear your thoughts around best practices, ideas for overcoming some of the challenges.

And so I encourage those who are on the webinar to please feel free to share those thoughts throughout. And for those who are here in person, we'll look forward to discussing those later on.

So these are the eight success factors that resulted from this study. And we can kind of group them into three categories. One is around setting the stage or defining the relationship between the research institution and the company. There is another set that's around understanding and valuing the company's role in the process. And then there is another set around the human element and the role that individuals play in this process.

And I'm now going to walk through these using one particular case study as a way of illustrating the examples. And this is a product called BIOFIX, which is a Rhizobium inoculate for leguminous crops.

It was developed by the University of Nairobi and is currently being commercialized by a company called MEA, which is a Kenyan fertilizer

company, and is available in Kenya as well as a number of other eastern and southern African countries.

The original research behind this product started in the 1970s and '80s. The original project was looking at collecting and studying the diversity of soil microorganisms in Eastern Africa. And then later developed into a project to develop a locally-produced alternative to similar imported product.

And you'll see me refer to this case study a few times throughout the presentation.

So the first set of success factors relate to kind of setting the stage or defining that relationship between the company and the research institution.

So the first is looking at what is the role of the research institution in the commercialization process itself. Is this a short-term role, is it a long-term role? Some of the roles that we saw our research institutions playing in Partnering for Innovation cases included actually producing the product in-house, acting as a licensor, acting as a consultant, or acting as a supplier or service provider to the company. And this is something where there's not really a right or wrong answer. And these roles are not necessarily mutually exclusive. But it is an important discussion to have.

Related to that is the issue of how that role would be funded. there's options around product funding, which of course is relatively short-term in nature. Other options that we saw used were fee-for-service or payment through royalties.

Now, in the case of the University of Nairobi and MEA, originally the university chose to produce this product in-house and then later changed to a role or acting as a license to Maya. And they also provide consulting services as well as act as a supplier for certain aspects of the product.

A second area is around intellectual property. This includes several aspects. One is understanding the intellectual property of the research itself; who owns it. In some cases it's public domain. In other cases it may be the intellectual property

of the research institute. Rarely is it the intellectual property of the researcher who developed it individually.

Now, this will largely depend on the legal structure of the research institution as well as in some cases the requirements of the donor that funded the original research.

A second aspect to consider is the intellectual property of the company. During the commercialization process, particularly if the research institution is acting as a consultant, they may be exposed to some of the proprietary information or competitive processes of the company and the company will want to make sure that that intellectual property is protected. Sometimes with a nondisclosure agreement or other type of arrangement.

And then the last aspect to consider with regards to intellectual property is what are the future implications for the researcher's ability to continue along with that line of study and to continue to publish on the topic? And these are issues that will want to be addressed in any kind of agreement between the research institution and the company.

In the case of the University of Nairobi and Maya, the university owns the intellectual property for BIOFIX and licenses that to the company. And they do have some aspects of nondisclosure around certain aspects of the research institution's consulting work to the company.

A third success factor is ensuring quality control. Some companies may require more technical assistance than others in terms of ensuring quality during the technology transfer process. And this will vary largely depending on the size of the company, the company's experience with similar types of products, and the company's ability to, for example, train their own staff. In some cases there may also be related regulatory issues as well.

So in the case of BIOFIX, the University of Nairobi included some requirements around quality testing as a part of the licensing agreement. They also agreed to provide staff training on quality and assisted the company with some of the regulatory compliance issues.

The next two success factors look at the company's role and understanding the company's role in this process.

Oftentimes researchers think that once their research is complete, it should be fairly simple and easy to bring this product to market. But the reality is the company still has a lot of work to do and a lot of investment to make to get to a marketable product. And this can include a variety of processes. So this can include for example setting up the facility in which the product will be produced, developing the process by which the product will be produced on a large scale, developing a supply chain, looking for logistics and distribution channels, developing a marketing strategy, addressing regulatory compliance issues. And these processes often involve a lot of trial and error. They are interrelated to each other. And this can take quite some time. So it's important to understand that process.

When we're talking specifically about smallholder farmers, there can be some additional challenges there as well. So ultimately for a product to be successful, the company has to be able to produce and sell the product at a price that is both profitable for the company and also is a price that the customer – in this case the smallholder farmer – is going to be willing to pay. And so sometimes that can take several cycles of development before they can arrive at that state.

The fifth success factor is around valuing the smallholder farmer as a customer. So as we move from a research phase into a commercialization phase, we are also kind of switching perspectives. Where instead of the farmer being a participant in a project or a beneficiary of a project, the farmer is now a customer for a product. And so the company now needs to look at how to make the business case for purchasing that product to the farmer.

Marketing to smallholder farmers often requires a bit more of a hands-on approach than what might be necessary for larger customers. We'll see that companies often need to look at these like having demonstration plots or trainings, more interpersonal interaction with farmers. Sometimes they may also need to address other issues such as finance that limit the farmer's ability to purchase the product.

And I will mention that Partnering for Innovation has done some other work around this particular issue and does have a number of studies and tools available on the website specifically addressing this aspect.

The last set of success factors focuses on the human element of all this. And the sixth success factor is around appreciating the motivation of the researcher. And in speaking with researchers involved in the Partnering for Innovation projects, most of them cited the personal satisfaction that they felt in seeing their research used and benefitting others as their primary motivation for engaging in commercialization. And many of them also noted working with a mentor earlier on in their career who instilled this way of thinking in them.

And this is important because most of the researchers also noted that working on commercialization often took away time from some of their core job responsibilities such as conducting additional research, teaching, publishing papers, and so forth. So that personal drive to see this through was really important for them

A seventh success factor is around valuing the relationships and networking. We found that in most cases the companies found out about this research through interpersonal communication, through relationships that they had with research institutions that could be formal or informal in nature. So in some cases it might be that the research institution and company had worked on a project together in the past. In other cases it might be that a relationship between former colleagues through a more casual conversation learned about the research.

So what we found was generally speaking some of these relationships came about somewhat by happenstance. And so as we get into the discussion, we would be particularly interested to hear from those of you that might have experience with some more formalized processes or more organized processes around that.

And then the last success factor is about involving the private sector early on. Most of the researchers mentioned that they wished that they had done this and that in retrospect they saw that the company brought a lot of valuable insights that it would have been great to have learned about earlier on. And this is particularly true for breeding programs for example where farmers are of course

purchasing the seeds and producing the crop. But if the farmer is ultimately selling that crop to a company, to a manufacturing or processing company, those company's needs and interests around traits are also very important and need to be incorporated.

And then lastly I would like to briefly highlight some of their overall lessons learned and conclusions from the study.

One was that it's very important for companies to play the leading role in commercialization. Because ultimately it's companies that decide if the product is commercially viable and if they're going to continue to produce it. So while there are valuable supporting roles for research institutions and NGOs, it's important that the process is ultimately owned by the company.

And so some of the recommendations related to that would be looking at structures to engage companies early on at a strategic level when we're looking at developing research programs with a commercialization objective. And then secondly when we are looking at developing programs specifically focused on commercialization itself, to look at co-creation or co-development processes that allow direct input from the company throughout.

A second lesson learned was around the important role that donors and host governments play in the process. In addition to directly supporting the commercialization process, they can also play important roles in terms of supporting broader agricultural development programs that then can provide companies with an informed customer base or informed supply chain base. They also can play a valuable role in terms of facilitating linkages between complementary projects. And of course in the case of host governments looking at regulatory environment.

A third lesson learned was around the broader communication between research institutions and companies. Oftentimes there can be a bit of a communication barrier there, as they're both coming from different perspectives and have different ways of looking at things. And so we find that sometimes it can be helpful in those cases to have an intermediary, whether that's a donor, an NGO, a business accelerator, or some other group that helps to facilitate that

communication. And so supporting entities like that is important to encouraging more commercialization.

And then lastly, the long-term nature of commercialization. It's not unheard of for it to take eight or ten years. This is something that takes a long time and involves a lot of trial and error. And so if we're looking at projects to support commercialization, it's important to keep that in mind. And when we do have projects that may be shorter-term in nature, that we're looking at some discrete pieces within that longer-term puzzle that can support and that we're looking at designs that are flexible to accommodate unexpected bumps in the road.

And so in conclusion, I would like to thank USAID and Partnering for Innovation for supporting this work. I would also like to thank the companies and research institutions that spoke with me as a part of this study for very candidly sharing their expertise and experience.

And we now look forward to having a broader discussion with all of you and hearing about your experiences, your ideas for best practices and challenges to kind of complement this study which was more specifically focused on Partnering for Innovation. So I'm looking forward to starting that discussion with my two fellow panelists, and then later opening that up to the broader participation. Thank you.

*[Applause]*

*Julie MacCartee:* Wonderful. Thank you so much, Virginia. And now we would like to welcome Erin McGuire from the Feed the Future Innovation Lab for Horticulture for a first response. So we'll bring her into the room via her phone connection.

*Erin McGuire:* Hello, good morning. Can you hear me okay?

*Julie MacCartee:* Yes, you sound great.

*Erin McGuire:*

Great, excellent. Thanks so much for having me today. Thanks for that great presentation, Virginia. I am Erin McGuire. I am the associate director of the Feed the Future Innovation Lab for Horticulture. And just a little bit about us. Our global network researches and shares evidence-based solutions along the horticulture value chain to help smallholder farmers harvest opportunity from fruits and vegetables to better nourish their communities.

And to do this a lot of our work involves building and researching new technologies to benefit small-scale farmers in transitional economies. So we are really excited to see this report come out. And I think it's such a great starting point on how to tackle this critical link from research product to commercialization. And I hope lengthy authors that it continues to spark important dialogue in this field.

Before I get started, I just want to thank USAID, Virginia, and other researchers for this work, and to all those who have helped put on this great release this morning. I wish I was there to have some of the coffee and snacks I believe you have.

So we at the Horticulture Innovation Lab really appreciate the opportunity to react and provide further insight onto this newly-compiled report. So I tried to take the major takeaways and address them in the manner organized by the report. And where I've used Horticulture Innovation Lab technologies as examples, I provided hyperlinks for those who want to learn more.

Partnering early, we were really happy to see the success factor included in the report. For the Horticulture Innovation Lab we have found a lot of success in partnering with private entities almost from the onset to conduct research. So not just at the handoff stage necessarily, but really in the product development stage and together go through research phases.

One example of this is with our pest exclusion nets in Kenya. We've been able to work with –

*Julie MacCartee:*

Erin, I'm sorry. I wanted to interrupt you for just a second. Because we're hearing a bit of a swishing sound when you're speaking now.

*Erin McGuire:*

Oh, I think it's my microphone on my sweater. I apologize, everyone. Thanks for the heads up.

So we've been working with A to Z Textile Mills in Tanzania over the past few years to test different versions of the pest exclusion nets that you see here and how that has worked for us. And this alluded to in the report as well, is farmers would use the nets over a certain period of time and offer critiques on the model. And then A to Z Textile Mills would be able to incorporate those changes in a way that was locally and economically feasible. Then A to Z Textile Mills was able to take the final product and sell the new technology across the region. So partnering early on has been very effective for us.

And one of the program officers actually who read the report in our office, he had a great comment. He said companies that engage with the development of the product will have a higher involvement and responsibility to commercialization of the product. So I think the report highlights that and we have really found that to be true as well.

Next slide, please.

So Networking for Success, I have a couple of points on this. And we have just found that so crucial to our work in commercialization. We found that intermediaries really are key to the commercialization process and in fact essential. Research entities like us are often small compared to what is needed to produce and distribute new technologies. We do not have access to farmers the way much bigger development actors and USAID value chain projects for instance do. So partnering with these bigger entities along with the private industry is really very necessary in the change commercialization.

And I just wanted to highlight two stories from two technologies that we have here to talk about the research handoff to farmer versus research handoff to distributor or other intermediaries which I think really is a difference between commercialization or not.

And one is the UC David solar chimney dryer, which we have created a manual and video to show to build it. And the Horticulture Innovation Lab is directly marketing it to farmers through our projects and partners. And the other is the DryCard that we have chosen to market to entrepreneurs who will make the card and then sell it. And I think the big difference here is that our partners remain at the center point really for the distribution of the solar dryer technology for right now. Whereas we've been able to create many centers of distribution for the DryCard by targeting entrepreneurs around the world to distribute. And I think the difference between these two technologies and our ability to really launch the DryCard commercial is that the solar dryer is a much more complicated technology. And again, going back to the report around ensuring quality control, this has really been a tough tension point for us. And when we really know that the technology is ready to be released, we spend a lot of time making sure we have created the best-possible manual for how to build and how to use the dryer. And it is complicated. It has to be simple enough to digest and understand and then detailed enough to build correctly.

But I think we also as researchers when we're thinking about the commercialization process have to think about how this technology is being built without our presence. We have a ton of expertise at the Horticulture Innovation Lab, and we often default to sending out that expertise to build these technologies, particularly the solar dryer. But I think we need to think about how and when we're thinking about commercialization how the technology can be replicated with integrity without PhD-level expertise. And that is a point when the technology is truly handoff ready. And so researching that, how others will replicate your technology the same way we might research the solution to a challenge I think is important in the commercialization process.

And to give the DryCard as an example, it's a much simpler technology. And by targeting entrepreneurs right away we've really seen a lot of progress in the commercialization process. For instance, we see others at this point presenting on the DryCard at conferences and to other development actors. They are touting this technology even though the Horticulture Innovation Lab has not itself worked with these people. So we think that is a great success.

And another great thing about the DryCard and targeting distributors kind of right away in a handoff-ready product is that it's available locally. As soon as the farmers learn about it, they are able to purchase it.

So we have found it to be really important to think about our network, think about who we're going to be marketing the product to, and making sure that it is handoff-ready, items definitely highlighted by the report.

Okay, my last slide is marketing to the consumer. For us it has taken some trial and error to realize that farmers in some cases are the ones that ultimately benefit, but now the ultimate consumer. So I know the report has a great section on thinking through the farmer being the client. We've had to think through a lot of stakeholders as the client to get a technology successfully commercialized.

For our drying bead technology for instance we worked with Reiner research, a private company in Thailand. And we originally focused on the farmer. And although we were able to together test that the technology was effective, the cost-benefit analysis revealed that it was too expensive for farmers.

So in the second iteration of the project, we trained seed companies on the technologies. And the seed companies were able to afford the technology, making it more sustainable. And this new technology allowed them to purchase seed from small-scale farmers by sending out drying beads in big drums, which you see on the left-hand side here. Which is much different than how we originally envisioned the technology use.

So this ultimately opened up a new market for farmers even though they were not the ones ultimately purchasing the technology.

So in conclusion, I think we need to think about every stakeholder when we think about who will be contributing to successfully commercialize a product. This means we need to put ourselves in the perspective of the small-scale farmers, but also the agribusinesses, government officials, and any other stakeholder that will be involved in the dissemination and use of the product.

Thanks so much. I've gone over my time. Thanks for bearing with me. We really appreciated the report, success factors and takeaways. And I'm glad we got to underscore what has really worked for us around partnering early, knowing what systems to hand off your technology to, and thinking through all the stakeholders

of the technology and understand how to best market your product. Thanks so much and I'll hand it back to you.

*[End of Audio]*