



## Agriculture Sector Council Seminar

# Public Sector Agricultural Research: Why it Matters for Sustainable Development

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Presentation Transcript

**Presenter**

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**Sponsor**

United States Agency for International Development

*Z. Baquet:*

Welcome everyone. Thank you for joining us on this rainy day. My name is Zachary Baquet. I'm the Knowledge Management Specialist for the Bureau for Food Security. Again, welcome for this Ag Sector Council for February on Public Sector Agricultural Research, Why It Matters for Sustainable Development.

Our speaker today is Ibrahim Shaqir from USDA ARS, but first I'm going to hand the microphone over to Dawn Thomas, Senior Agricultural Advisor in the Bureau for Food Security and division chief for the knowledge management and training division within the Bureau for Food Security.

*D. Thomas:*

Thank you, Zachary. Good morning, everyone here in person and our online audience.

Today marks the third anniversary of the re-launch of the Agriculture Sector Council. So we thought we'd take a few minutes just to tell you a little bit more about the Ag Sector Council.

When we launched it in its current format three years ago, our primary objective was to contribute to the professional development of agriculture and rural development practitioners in the agency as well as those who associate with us because as you know our institutional contractors participate or NGOs and others who work with us participate. So it was to contribute to all of our collective professional development.

Secondarily, it was to nurture communities of practice within the field of agriculture and rural development.

By the topics we've discussed over the last three years by the very rich discussions that we've had over the last three years, we hope that we have indeed contributed to your professional development.

I want to take this opportunity though to thank our leader for three years of exceptional vision in taking us off in incredibly new and different directions with the Agriculture Sector Council. We very quickly after the sessions post the presentations. We're doing all kinds of things.

The last time we had a presenter who was physically in Tanzania, but was able to deliver his presentation right for you seamlessly. So I want to thank Zachary for that and I also want to thank our collaborators through the KDMD Project for all of the work that they do to facilitate this.

Moreover, I want to thank you, our very loyal followers who come here each time and those who also tune in from India and other places and different time zones. So thank you.

*Z. Baquet:*

To follow on with that, I just wanted to thank you myself personally for being such a great audience for participating, for really sharing your comments and enthusiasm for this platform. With that, I just wanted to show to you the strength of your participation the following.

So when we first started this in year one, three years ago, we had a total of about 223 participants over the course of 9 seminars. Most of these seminars were actually internal to USAID and so we had very few external participants.

In year two, we started having it very much outside of USAID. We started carrying this as a webinar and participation doubled. The bars here, the lighter colors represent the online participants. So our online participation has really grown. So in year three we've had almost 1,500 participants total over the course of 11 seminars.

So again, I thank you. You've grown extensively. I appreciate it. Keep your feedback coming. We hope to keep delivering technical content that really suits your needs in terms of professional development.

With that, I would like to thank those who make it possible. So on USAID, we have a lot of people who've worked on this. Dawn Thomas, who just spoke, really generating the ideas behind a lot of this and also bringing this venue back into life. Belien Tadesse who's actually in the USAID mission in Ghana. She led this for the first three events and then convinced me of how worthwhile it is and coached me on how to start it.

Stacey Young and Lane Pollack for on the USAID side leading of the knowledge driven Microenterprise development project who is the project that we utilize to bring you these series.

So on the KDMD side I'd like to thank my collaborators on that side. Meaghan Murphy, who has been here with me since the beginning for two years working on this and bringing this to you. Dar Maxwell and Adrian Gaskin who have done an exceptional job on bringing that great quality of the online user experience for you.

Julie MacCartee who has taken over recently gets the invitations out and coordinates with the speakers. Then also the teams within KDMD, the communications team, the assessment and learning team who does the evaluations, and the Ops team who all help in bringing these events to you. Then also our past and future presenters. I thank you as well.

With that, I'd like to pass this over to Ibrahim Shaqir from USDA ARS, the Office of International Research Programs to talk about his topic today of why the public sector agricultural research matters. Ibrahim.

*Male:*

Thank you, it's a great pleasure to be here. I see a lot of familiar faces so I feel kind of at home.

I selected this topic because it's important to me and it's close to my heart and I'm very passionate about it. Agricultural research is essential for agriculture development. I see it working with a science agency within ARS and really a key to continuous sustainable agricultural productivity growth and dealing with very important issues of food security.

So I want to thank you for coming and thank all of the people online. I hope this will be a beneficial presentation to you and will wait until the end and if you have any questions I will welcome that as well.

So that said, what I will be covering today and to give you an idea about agriculture research aspects on how that contributes to development, I will mention some of the things that we're doing here in the U.S. that deals with these very important issues on how public agriculture research deals with very vast challenges and important priorities for our country that covers all aspects of agriculture assistance in the U.S. and the end result of that, our stakeholders and partners and other countries also benefit from that.

I will also give a case. I will mention it to you now. I'll be talking about the case of Brazil and how they transformed their agriculture system beautifully and to the way they are really great producers. They're producing high quality agriculture products and they are number three and I will talk about that ag trade country in the world when it comes to trades that deals with agriculture soybeans and other products.

I will mention also just briefly on how our department and I'm not representing the department here, but I'm representing my agency and the things that we're covering under Feed the Future initiative and how we're contributing in terms

of we're showing a great initiative in dealing and bringing what our capacity and leveraging that in support of USAID and in support of Feed the Future initiative.

Then I will talk about other areas quickly about different partnerships we have ongoing.

So what differentiates what agriculture research, the fact that it has very different characteristics that are vast, that are difficult to control unless we have a mass effort in dealing with many challenges from and because of that different and predictability of agriculture production when it comes to plants and animal health issues that requires greater effort on a sustainable basis to maintain that kind of preventing diseases, dealing with diseases, and improving the genetic diversity of our plants and animals.

The influence of weather is particular now when dealing with the different climatic change that we have in the U.S. and we try to devote specific targeted research to specific areas of production systems in the U.S. and that's also true anywhere in the world.

So the structure and the size is vast. That's important to maintain that, one size doesn't fit all. So we have to tailor specific issues when comes specific strategies for specific problems and the different cropping systems and the different diffusion and farmers disbursements and where we go different things. Sometimes similar things, but our effort, it's really hard to coordinate unless we have a specific local and regional strategy.

The public sector fills the gap where the private sector does not. In many cases we're dealing with small farmers. There are really specific crops that do not bring any interest from the private sector to make it commercially viable for them to do anything with them.

So our road here is to within agriculture research service and other public research entities within the land grant communities is to research a community, help us target farmers and crops that are not commercially viable that require – with no incentive from the private sector to invest in.

It serves a national interest when we're talking about, for example, when it comes to zoonotic diseases when dealing with animal health issues and plant health issues. I will mention some of that quickly in my talk.

Unless we deal with it, unless we have the capacity within government to deal with these important issues. So with the help and coordination with sister

agencies, ARS works with AFS for example, dealing with the zoonotic diseases that is of great importance to the U.S. in preventing these kind of diseases from coming to the U.S. and have a strategy that requires unified coordinated effort that deals with these issues. This is on the animal side.

This is true also on the plant side when it comes to plant diseases such as citrus greening, \_\_\_\_\_ 99 and other rust disease that targets the soil, for example.

That's also an important national security issue here that our national research entities within government devotes much of its resources to ensuring the food safety and all aspects of the whole chain that it's secured and if there is anything when it comes to outbreak we are aware of and we have an idea about what to do when it comes to that.

So I mentioned all of that and I will run through this. In summary, whatever we do within government, whatever we do in the public sector and not taking away anything. I just want to make this point.

I am not saying the public sector should be taking all these initiatives on with them. This should be coordinated where the public sector would have a role to play, as well as the private sector. Public/private partnership that feeds into what we try to do in the U.S. and this is a model that must be applied everywhere else.

So, it's essential for us and I mentioned some of that, the food security aspect when it comes to conservation and watershed management, the nutrition aspects for the public in maintaining and dealing with these whole issues with, for example, obesity now, nutrition. You have to have intervention from government entities to keep research ongoing to keep up with the technology, to keep up in addressing the public concerns when it comes to nutrition, for example.

I mentioned the national security aspect when it comes to food safety and maintaining pathogens under control to ensure the safety of the public.

The non-researched public aspect of, as the public good of that, is having the infrastructure and the capacity from the scientific capacity to the infrastructure in that. For us it's a joint effort where we have coordinated our effort within government to work closely with our land grant university community to ensure that everything is coordinated and maintained where we can have joint linkages between what goes on in academia as well as within the research community within government.

So, I mentioned some of that, the food security. These are the latest challenges, the 21st Century challenges that we are dealing with. Food security. Even in the U.S. we are aware of that. Poor people cannot afford certain things. They pay high cost for the food. Much of their income goes on spending on food. That's true everywhere.

Food safety, nutrition and health, bio-energy and looking at alternative crops to bio-energy is essential in maintaining the price of crops that are utilized right now, like corn, for bio-energy as a resource. The climate change aspect and dealing and coming up with strategies to deal with mitigating climate change and adaptations, of course.

So the role of science here is to come up with new, increased nutrition of foods within the crops when it comes to biofortification or other aspects of improvement in genetically modified or increase the productivity of crops. Natural resources are limited so strategy is to really keep on focusing on how can we maintain, how can we optimize production with the current resources we have. I will also address some of that.

I mentioned we have to devote much of what we do right now in dealing with alternative to bio-energy crops that we're currently using, such as corn. The climate change modification mitigation. We have a strong and important role to play.

So, you've seen this many times. I'm not going to touch on it. The idea is clear. By 2050, population will be about 9 billion people. We have to double our production. We have to optimize it. Keeping in mind the current resources that we have.

With that, what we need to do, the current growth is about 1.4 percent. This is a total productivity factor meaning that we have to maintain increased productivity, not production to meet the demand and at about 1.7 percent by 2050.

For many years, we have in the 60s productivity was the result of the agriculture revolution. Emphasis on fertilizers and irrigation. We increased production. Right now, emphasis, the latest is really to emphasize production by enhancing and improving the productivity factor. That's very important.

So, with that we see opportunity as well. So the opportunity here where we see China and Brazil, for example, are really progressing and using the very important technology and making it adaptable to their countries.

I will mention China. They're at 2.5 percent. The result of that was to utilize technology, make it adaptable to their needs and enhance productivity. The same is true with Brazil.

So the opportunity here that we see is, and I was surprised to see that actually, former Soviet Union countries are at 0.6 percent, slightly higher than Sub-Saharan African countries at 0.5 percent. So clear potential for Sub-Saharan countries productivity growth where we can optimize the current resources available instead of expanding resources that utilize and optimize productivity from the current resources available.

Same is true with – I'm not going to touch on the former Soviet countries, but clearly Brazil at 2.4 percent total productivity factor.

So, how do we close the gap? By investing in agriculture research for many years and from my experience as a farmer myself, recognizing that agriculture technology research, the scientific needs to tailor it to specific areas is really essential in closing the gap.

So investing in agriculture science is essential to improving that. With that comes you need the commitment and leadership of countries to really to move their nations forward. By maintaining and doing the same thing over and over again we are not going to really progress and we are basically sitting our self to fail again.

So this is an opportune time now that we can emphasize on building the capacity, the scientific capacity by investing in the human capacity, as well as infrastructure to provide some kind of opportunity for countries to tailor and address their own agriculture priorities through science.

So demand growth poor countries where opportunities \_\_\_\_\_ in productivity and I talked about that in the previous slide. In order for us to increase productivity in these countries, we must optimize productivity from the current resources available.

So, I want to talk. I mentioned Brazil. Just before I move onto the next slide, Brazil in the 1970s was developing nation, they struggled with poverty, they struggled with food insecurity, they didn't know how to really deal with the

population growth, they could not provide enough food for the people to meet the demand.

So, the country as a whole, the leadership, took on a very important initiative and worked closely with USAID at the time in the 70s to enhance their agriculture product – to come up with an idea, strategy to improve their agricultural system and productivity and invested in the human capacity by training scientists, as well infrastructure.

The result of that, so if you could see the red line there, that's the current level of productive land basically. You have the blue as production. The green is productivity. And focused their strategy, much of their strategy on productivity rather than expansion of resource of additional land.

They could do that by obviously deforestation and bringing new land into productivity, but they elected and they're stressing more on that now more than ever because of how much attention the world's paying to what goes on when it comes to the Rain Forest in Brazil.

So they're emphasizing for them to be sustainable, they emphasized on technology. Technology that is adapted to their needs and to improve productivity rather than expanding their natural resources. That's the end result.

So you have they doubled their production when it comes to beef, milk, vegetables and the end result was they're from net importers to net exporters of food in a very short period of time.

Forty years ago their GDP was about \$45 billion. Right now is at \$2.87 trillion. Their investment in science doubled. It's about 2.85 percent of their GDP. Maybe slightly less. That's a commitment from the Brazilian government.

So, I borrowed this slide from our Embrapa colleagues. So were established in 1973 they right now employ about 9,000 people. The total scientific human capacity have about 2,024 people. Ph.D.'s and that's really where they emphasized and invested in. They have 1,600 scientists with Ph.D.'s. Much of these scientists were U.S. trained, went back and contributed to their economic and agricultural development.

What's interesting about all of that is they tailored their research to the specific needs of their people. They devoted much of their resources to dealing with crops that are great importance to their people from beans, from sugar cane to

anything that can be used as cash crop and then on the monocropping system to make the soy production is really huge now.

Which led us now to believe and where now they are partnering with AID on several projects around the world and in Africa right now in Mozambique. One example of that partnership.

So, in Africa the funding level of science remains low with the exception of four countries in Somali, or I think South Africa, some other nations that have devoted one percent of their GDP to enhancing science and they're making progress, but the capacity's still low, their laboratory's still suffering, little practical training for researchers.

There is a gap between academia and their ag research centers. That's something should be addressed. There is no linkages unlike ARS and other science agencies here in the U.S. where you have co-located government agencies, research agencies working closely with scientists in that particular region to deal with specific problems.

Of course, the obvious one, it's the poor governance and the lack of leadership to really bring these countries to the next level like Brazil and other nations.

So, food security. So in order for us to deal with these very important issues, countries have to address these important areas of research to deal with their own challenges from training to identify and develop and release markers of lines to enhance the capacity of breeders and provide them with the opportunities for training to maintain their bio-diversity in both crops and livestock.

So, let me touch on then Feed the Future quickly here. Some of you are aware of how we got together and working closely with USAID and state and dealing and supporting with Feed the Future initiative.

This is really a unique opportunity for us and the Feed the Future to have this close partnership with AID. We very much appreciate it and welcome it. We are committed to doing our best and providing our part and contribution to the strategy.

So the focus, as I mentioned, are nine countries where USD has the capacity and that can leverage it to deal with in addressing Feed the Future priorities.

Focus on transformative areas for research and advanced productivity. That's in dealing with the different crops in these countries that of great importance to them. So we'll focus on that.

Let me just – so AID USD work closely and came up with agriculture research strategy in support of Feed the Future. The strategy came about of many discussions, workshops where contribution, where many scientists from academia here in the U.S. and abroad in also surveying the different missions of these targeting countries under Feed the Future.

These are the priorities. The agenda is to advance the productivity frontier, breeding and genetics, transforming production systems and enhance food safety and nutrition. So these were the main focus areas for Feed the Future research strategy.

I will quickly talk about this. So when it comes to genetic resources and maintaining the bio-diversity aspect of breeding and ensuring that we have the varieties that are resistant to serious diseases, we maintain a germ plasma collection that we are to keep to ensure that our scientists, the scientific community have access to that and to ensure that we have and maintain varieties that are resistant to the different diseases.

By the way, ARS provides this to anyone, any scientist anywhere if they'll just write an e-mail with a specific variety that you want. We will be able to disseminate it at no cost.

We have cutting edge technologies that we are working on within agriculture research service. This technology that can be at some point disseminated to countries to optimize, in this case, would be dairy production. So we are about to implement this kind of technology here in the U.S., this snip technology through these genetic markers.

We made this effort efficient and I will give you an example. I'm not an animal health or production expert, but I can tell you that I was told for a bull to be productive bull and to be able to breed, now they made the selection, you had to wait about seven years to identify a bull that can be productive and provide you with the best genetic aspects to enhance and maintain high level of productivity now takes no time. As soon as the bull born, you know this is a good bull. So to ensure the productivity and enhancement of the dairy industry.

So and I will try to wrap it up. So we talked about the research strategy. We talked about Feed the Future and at some point Administrator Shah and our

Secretary Vilsack signed an MOU to formalize this partnership to really take advantage of our capacity and leverage it in a formalized way under Feed the Future.

So they signed this MOU, the Borlaug Commemorative Research Initiative to develop and co-fund research collaboration between USD and USAID and expand research collaboration with the CG system and align U.S. government, current research, ongoing research with research required under Feed the Future.

In addition to that, to be able to co-fund and coordinate innovate public/private research part. I will quickly mention some of that.

So these are the research priorities that were identified after extensive consultation with the missions and that resulted also from the different workshops that AID organized. The end result was these are the priorities. U.G. 99 weed stem rust, livestock production and health, post-production and mycotoxin. I will be happy to talk about all of that.

In addition to all of this, we have been engaged for many years in dealing with Aflatoxin in Africa. We have ongoing relationship with many of the CG centers there, as well as the national research centers in countries.

We have been active, but this is where now we can leverage Feed the Future resources to make an impact and scale it up, as you like to say at AID. Scale it up. So that's what we're trying to do.

Important partners that we work with. We work with the CG centers. The Chinese Minister of Science and Technology wants to work closely with us in dealing with Feed the Future, Embrapa.

We have a coordinator from Embrapa at our office actually where we have several Brazilian scientists working with us right now, about 6 of them, but we also have 25 post-docs. So there are again, they're investing. Simit I mentioned. So they're all part of the CG. So the Aflatoxin work that's going on in Africa, it's coordinated and in partnership with IITA.

\_\_\_\_\_ work with us on the cocoa production in partnership with Mars and the chocolate industry here in the U.S. and abroad in maintaining Mars as well, maintaining the productivity and ensuring that diseases are dealt with in this very important cash crop in Africa.

So with that, I thank you very much and I welcome any questions. The key point is really not to forget and keep in mind any time you're thinking about a strategy, think about how we can improve the system in place within government, any foreign government that we're dealing with and slowly but surely if you emphasize the importance and you're working on a small model that can be from a localized to become a regional and eventually can be expanded to other countries.

Government agencies, they have an important role to play here in the U.S. and abroad. If you don't have that you don't have a sustainable growth and production and productivity as well. The reason why I'm saying that is we're dealing with the poorest of the poor. For them government has to play an important role in dealing with this important issue. So with that, thank you.  
*[Applause]*