



Agriculture Sector Council Briefing

Millions Fed: Proven Successes in Agricultural Development

Includes introduction by Dawn Thomas

Senior Food Security Advisor, USAID Bureau for Food Security

February 09, 2011

Participants

David Spielman

IFPRI

Sponsor

United States Agency for International Development: Agriculture Office

Male:

Okay. Good morning. Welcome to the Ag Sector Council for February where we will be giving a presentation on Millions Fed: Proven Successes in Agricultural Development with our speaker, David Spielman from IFPRI, and greetings to everyone online as well. Thank you for joining us. And with that, I will give this over to Dawn Thomas, Senior Food Security Advisor for the Bureau for Food Security here at USAID who will do the introduction. Thank you.

Female:

Thank you very much, Zachary. That's the first time I actually got called that, a senior food security person. I am Ag economist. Anyway, good morning to everyone here present and to our growing audience of 39 that we currently have online. Today is an auspicious occasion because it marks the second anniversary of the launch of the Ag Sector Council in its current format.

So far we've had 20 or so seminars similar to this one. We've had speakers such as John Moore. We've tackled subjects such as rural youth and employment, warehouse receipts, climate change in agriculture and a host of other issues. And many of these seminars are available online.

With these seminars, our objective was to bring together agriculture and rural development practitioners such as yourselves from outside and from within the agency so that we could contribute to and advance the professional development of one another and to advance the knowledge in the field. And for that reason you see that Zachary Baquet, our Knowledge Management Advisor, plays a major role in capturing and then disseminating this knowledge. So the knowledge management and sharing piece is a very important part of what we're doing to develop ourselves as agricultural rural development professionals.

So today we bring you a presentation on the work of the International Food Policy Research Institute, IFPRI, an important piece of work they've done called Millions Fed. When I read about it, I was quite excited and I thought that it actually lends itself to a whole series of presentations or of engagements with us. And I hope that that's what Zachary has in mind in the future.

But what this project does in a nutshell is that it documents evidence. It documents evidence on the kinds of policies, programs, and investments and interventions in agriculture and rural development that in fact work or have worked to reduce hunger and poverty. Today several of these successes are going to be discussed by our speaker, Dr. David Spielman. You have his biography, so I won't go into any details about it, but let me just say that as a research fellow at IFPRI over the past seven or so years, Dr. Spielman's work has covered the full range of issues that fall under the broad category of agriculture and rural development.

He previously worked with the World Bank, with the Aga Khan organization and other development institutions. Much of his work has had a regional focus on east Africa and south Asia. So, with that I just ask that you give him your full attention. You turn off your cell phones and you pay close attention to what he has to say. Dr. Spielman?

Male:

I think I have my mic, so thank you for that lovely introduction. Thank you, Zachary for organizing this and John McMurty for putting this together or suggesting that I talk to you today. It's a real pleasure to be here. In the spirit of disclosure I should say that not only is it exciting to speak at USAID, but I'm also sort of a product of USAID if you will. Both of my parents worked for the agency.

I grew up in Pakistan during the time when USAID had an extensive program there back in the '80's. And as John and I were discussing recently, there's hope to have more there, especially in the field of agriculture because it's one of the many important countries that USAID works in. And USAID has done a lot of excellent work there in the past, so we can talk about that among other things as I go through this.

I'll try to keep this relatively short and give you a flavor for what we did with this Millions Fed project. And hopefully for the people online and everybody here to stimulate some discussion and get you thinking about some of these issues that you deal with on a day-to-day basis. Let me start, if I get into technology, right? Right.

You know, back in the late 1950's there were about a billion people or one-third of the world's population who were going hungry. Over the five decades that followed, farmers, scientists, politicians and many others took action to boost agricultural productivity and production. You know they focused on improving the availability and the access to food. That was the main priority over those years.

Today about a billion people still go hungry. And if you think about it, that result sort of sounds like a failure doesn't it? I mean one billion people still food insecure. It really is a global tragedy.

But if you look at it from another angle, the result is an astounding success in the sense that the absolute number of people who are hungry today remains unchanged. And the relative proportion of the hungry has decreased as the world's population has doubled since the late 1950's. So whether you play with the numbers or just think about it in realistic terms, we have achieved a lot. Over five billion people are food secure today and that fact can be greatly attributed to successes in agricultural development.

Unfortunately, as all of you know from your own careers, your own experience, these successes are often overshadowed by the gloom and the doom, by the crises and the calamities that play out in our newspapers, on our radios and on television. So in light of this fact and with support from the Gates Foundation, we undertook this study, Millions Fed: Proven Successes in Agricultural Development beginning in 2008 and through 2009 and up to last year even. We did it as was explained to identify and assess interventions in agricultural development that have substantially reduced hunger and malnutrition. We did it to document and synthesize evidence on where, when and how these interventions actually succeeded. And we did it to share lessons as we're doing to day to help inform and improve policy and investment decisions on agriculture.

You know Millions Fed builds on a lot of previous work. It's really not the first sort of compendium or collection of successes in agricultural development. But it is unique because as is, what we do at IFPRI, we looked at the hard evidence on large-scale successes. There are lots of stories about small projects that have

worked and those are really important contributions to development. But looking at the large successes and looking at the evidence behind those large successes is really the unique contribution of this work.

So to give you an idea of what we did and how we did it, we received about 215 nominations and cases to look at or identified that were potential successes. We went through a very rigorous vetting process using a strict criteria set we developed to weed out things that really weren't successes from our perspective. And we had an international advisory panel to support us in our work and we used a very rigorous peer review process when we started documenting the evidence. So from the 250 potential studies, we were able to identify 20 cases. It's a nice even round number, but that's simply a coincidence.

The successes are rich and diverse in nature. They vary in terms of time, space and character. They're global. They're regional and national and they're always local in a sense. And they're a lacerative of a wide range of pathways to success.

Of course we recognize that there are many other successes in agricultural development not covered here. This isn't an exhaustive volume in a sense. In some cases though we found that the successes were still relatively small and waiting to be scaled up. In other cases the successes were too recent and waiting to be tested by time.

And in other cases the successes were real. Real things were happening out there, but they hadn't been sufficiently documented or evaluated. So in a sense what we're hoping is that this research, the Millions Fed project will help stimulate new efforts to identify, document, and substantiate successes that are still out there or in the making.

It's worth thinking for a moment about what types of successes we've seen over these last 50 years and how they've evolved over time and changed. You know 50 years ago, the work of USAID, the work of USDA, the work of the International Agricultural Research Community, the United Nations and many

others focused on one primary theme: intensifying food stable production. Wheat, rice, maize, a couple of other crops, but basically it was intensification of food production.

Since that time, you know we've – our focus has evolved. We've forayed into community drive and environmentally sustainable development in the '70's. And in the 80's we started programming around market driven development to generate higher incomes and higher value in agriculture. We've also seen a shift over the decades from viewing agriculture and smallholder agriculture as sort of that lagging sector in the economy as we're moving to agriculture as a driver of economic growth.

And that's really I think a revelation in the last two decades at most. And with that has come a lot of policy reform processes that we didn't look at 50 years ago to make agriculture really drive economic growth. Finally, and I would say most recently we've seen efforts to address the issue of food quality and nutrition with interventions that promote the cultivation and consumption of say healthy micro nutrient rich foods, both grains, vegetables, livestock, fish, dairy products and things like that. That's really sort of the last frontier that we're working on at the moment.

So let me give you first – I'll give you three examples of what's in this book and there's a brochure outside. There's a book. There's a compendium of technical papers. There are technical papers online. All of this you can find if you want to dig deeper into this successes. And then after I talk about three of these successes, I want to talk a little bit about a USAID funded project that I'm involved in, the Cereal Systems Initiative for South Asia to give you an idea of how these lessons learned are being applied on the ground.

So let's go back to the first real success story in agricultural development, something that I think a lot of people in USAID should be familiar with and which USAID contributed to and that was the struggle or the fight against stem rust and other wheat rusts that was pioneered by Normal Borlaug, the Nobel Prize laureate. This began in about the 1950's where farmers in North America and South America and other parts of the developing world were confronted with a major threat to global wheat cultivation. That was rusts or fungi capable

of decimating wheat and spreading via the wind across huge distances. To tackle this threat, a group of scientists began a rust resistance breeding program, citing much of their work in Mexico with support from the Rockefeller Foundation.

You know if you look back at the history of this famous case, Norma Borlaug and many others will point out that scientists were actually quite skeptical of the approaches and methods being used in the rust resistance breeding programs at the time. They said it couldn't be done based on the methods that were being pursued. But with Borlaug's leadership and with investments by Rockefeller and others they not only developed rust resistant varieties that are still in use today in many developing countries that we work in, but they also initiated a global program, sort of the first of its kind to leverage modern science for agricultural development.

If you look at all the international programs and consortia and partnerships in global health for instance, around tuberculosis, malaria, HIV, AIDS and whatnot, a lot of those were started based on the premises of this global program of what Normal Borlaug did 50 years ago. This was one of the first real initiatives to tackle a global problem. The impact of this wheat program was that worldwide an estimated 117 million hectares were protected by the cultivation of rust resistant wheat varieties ensuring food security for between 60 and 120 million households at the time. And of course many of you also realized that this program has stood strong.

Its work has stood strong for 50 years and it's now being threatened by a new virus, a new threat – excuse me – UG99. USAID is behind that among many others to help the international community to get back on track and do breeding programs to develop UG99 rust resistance which actually broke down some of the work that was done. So you know the fight, the struggle keeps going and its successes are a continuous one.

But let me step back from sort of the formal successes where US AID or Rockefeller and scientists and science had a real role and talk about something a little more grass roots. And this is the story in Burkina Faso, which has really

gotten a lot of attention even before we started doing it, but certainly in the last six months. Burkina Faso to a certain extent Niger.

In the 1980's communities in Burkina Faso's central plateau and in southern Niger were recognizing that the repeated droughts and failures of large government development projects were threatening their livelihoods. There was a lack of rainfall. Their soils were barren and crusted. Their forests were disappearing and they were losing essentially the key resources needed to sustain their lives and livelihoods.

So with the help of community leaders and NGO's, especially at the local level, communities began to take action to change their fate. They developed planting pits to trap rainwater and organic waste in which to cultivate millet and sorghum, the main staple in that region. They constructed stone bins to trap soil and rainwater runoff to improve soil fertility. And they regenerated their traditional trees and forests to generate fruit, fodder and firewood both for consumption and for sale. So between the early 1980's and today, about 5 million hectares have been regenerated by communities and community based organizations providing additional resources to feed an estimated three million people.

What's interesting to me about this story among many other things is not only the fact that it was driven by communities, but if you talk to some people who are involved, they'll tell you the scientists and the researchers were sitting in their research campuses and did nothing. They really didn't know what the solutions were. I don't know the extent to which that is really factually true, but there's a lot of anecdotal evidence to say that this was a grassroots success, much more than it was say a scientific success and that governments really didn't play the right role until much later. So it compares well to other successes we've seen, but in a very different way.

Now, let me talk to you about the third example, which is one of our most recent sort of success stories that's well documented and supported by very good evidence of the scientific scholarly nature. In the 1990's, Bangladesh embarked on a slightly different effort or initiative to feed its population. Public health studies had recognized that many Bangladeshis suffered from conditions

associated with micronutrient deficiency, for instance night blindness among women and children due to deficiency in Vitamin A. So to address this problem and the general problems of malnutrition, Helen Keller International and a large number of Bangladeshi non-governmental organizations began promoting homestead production of micronutrient rich foods, leafy vegetables, fruits, small livestock and poultry. And they combined it with a grassroots program on nutrition education.

So between the 1970's, between 1970 and 1996 when the program began and when it was scaled up, the Homestead Food Production program succeeded in tripling vegetable production and improved food security for about five million people. Now that's a drop in the ocean in a country like Bangladesh, but is not an insignificant scale of impact if you think about it. And most importantly, its intervention achieved success in a way that directly reached those who were in the best position to improve household nutrition – women. And that was one of the great innovations in that project among others.

So drawing back from this in the 17 other case studies we looked at, we ask ourselves well, why did this work? There are at least eight reasons to explain that. And I won't go through each of them, but let me talk about four of them that are important. One is of course sustained investment in agriculture science and technology.

Now as I said, science is not always the key solution in all cases, but if you look at the 20 successes we've looked at, certainly science and technology has played a role. It's illustrated in the global effort to breed and disseminate rust resistant wheat, a high yielding mung bean and hybrid rice among others. Conversely, it's illustrated in the halting of yield growth in maize in Zimbabwe, Zambia and Malawi when government support for a public R&D declined in the 1990's.

Another important aspect, and I think these are fairly commonsensical, investment in complimentary areas, rural roads, irrigation systems, information and communications networks, rules and regulations to manage and promote market development. You see that in the commercial deployment and delivery of improved sorghum and millet in India where the private sector played a big role or in hybrid rice in China, again where the private sector actually plays a

significant role. You see that in the development of the dairy industry especially in India with Operation Flood, which was again one of our success stories.

One of the other sort of keys to success is private incentives. It's seen in the return of land tenure rights to households in China and Vietnam during the 1980's and 1990's, really, China being the biggest story in Millions Fed in terms of achieving food security, reducing hunger and malnutrition. The household responsibility system changed the food security scenario or landscaping in China dramatically during the first half of the 1980's.

And the fourth point I would raise is cooperation and collaboration, both local and global. So the global effort to contain wheat rust for instance which I mentioned involved 50 different countries, numerous donors, the CGIAR, the Consultative Group on International Agricultural Research of which I'm a part, and the National Agricultural Research Systems of all of those countries. At the local level, again cooperation between communities, community based organizations, non-governmental organizations in Burkina Faso and Niger has been a key driver of success, even despite the failures of government.

So coming out of this, I think there – there we go. The question is, well what can we learn from this exercise? What can we learn from the evidence we really looked at? And there are 5 points I'll make and they're all really key.

First success is not unambiguous. There's no such thing as a clear unequivocal success. Many successes are accompanied by some very difficult trade-offs. There are winners and losers in all of these studies. You know the green revolution for instance, one of the most famous success studies, doubled cereal yields and doubled cereal output in South Asia at the expenses I'll talk about a little later of water supplies and soil health. Land tenure reforms in China and Vietnam – they generated some very significant negative impacts for women and women's access to land use rights and also some negative impacts on the management of forests and common property resources like pastures or fragile hillsides despite the massive productivity and income effects of those reforms.

The other point of course is that success is a process. No success simply results from one single technology, one market niche or one policy correction. They are iterative learning processes people like to say. They occur in fits and starts. They never happen so smoothly that we can say this is it.

Third, success is not a substitute for strategy. It's not enough to put our hopes in one-off interventions or one-off projects. And this is something that really came out of what we looked at. There are lots of successes where a single intervention has worked really well for a small number of communities or for a single country. But it's the enabling environment that allows many successes to take off or replicate or scale-up or duplicate in a given country or a given region that really drives success.

It's not enough to say, hey. We got this project off the ground. We're a great country. We're a great agency. The question is, what's the enabling environment to allow many others to do similar or different things within that context? And really, success is not a substitute for a good strategy to make that happen.

The fourth point is that for successes to be recognized as such, we do need evidence. Systematic and rigorous evaluation of the impacts of an intervention are key. They're key because they allow us to learn lessons on how to replicate, to adapt and to avoid pitfalls. And that was possibly one of the largest challenges in identifying successes in Millions Fed, finding good evidence.

And of course a fifth point is that investing in agricultural development is more important and urgent than ever. We know that given the world food price crisis we experienced two years ago and again the world food price crises we're experiencing right now.

So I want to turn now to the Cereal Systems Initiative for South Asia to which USAID is a major donor alongside the Bill and Melinda Gates Foundation. The project builds on the proven successes. One particular case study that we highlight in Millions Fed and that's on zero or minimum tillage wheat cultivation

in the cradle of the green revolution, Northwest India particularly Punjab and Haryana states of India.

For those of you who are not agronomists or Aggies, zero tillage is essentially a well established set of agronomic practices designed to minimize soil disturbance, thereby reducing water usage and conserving soil fertility. I'm an economist, not an agronomist. So feel free to correct me on that definition. But basically the idea is that instead of tilling and plowing and turning the soil, you actually drill small holes or small furrows to plant seed and lay fertilizer, this way conserving water and conserving soil fertility and making the best use of plant residues from previous crops, things like that.

Getting it to work in smallholder farming systems has been a challenge. It works in Argentina. It works in the United States and in Canada. It works in Brazil where you have very large farms and very large levels of mechanization. Getting it to work with farmers who have less than half a hectare of land in India is a very different story.

So the Cereal Systems Initiative for South Asia builds on the success of zero tillage in Punjab and Haryana states of India by expanding and diversifying this approach to what we generally call conservation agriculture or resource conserving technologies. Its objective is there. It's covering four countries with support from Gates and USAID. We're in our third phase on the part of the project. John McMurty is as well as many others. We're in the first phase of the project and we're moving hopefully into our second phase later this year.

The reasons for getting into this project are both straightforward and fairly complex. First, the project is obviously driven by concerns about food security and in a country like India food self sufficiency, which is part of the national agenda. And you can see that the growth rate of cereal yields has slowed dramatically since the green revolution when we saw that doubling of yields and output over a 20 year period, particularly for rice and wheat which are the main staples in the region. This is data from India, but data from the other countries, Bangladesh, Nepal and Pakistan, are very similar.

Second, another driver behind this project is the use of agriculture's natural resource base has exceeded safe and sustainable levels in many areas. The off take and use of ground water for instance, shown here for India by state is unsustainable at levels above 70 percent so I'm told by the experts. This over exploitation is a reality not only for water, but also for soil fertility, crop by adversity, electricity for agriculture, chemical fertilizers and even pesticides in many parts of South Asia. And trying to find ways of reversing this or minimizing the use, the over-exploitation of these resources is part of CSISA's mission.

So CSISA's approach is based on an integrated agenda of I guess revitalization is what you might call it. We're looking at new crop management practices such as zero tillage. We're looking at new seed base technologies such as drought and saline resistance or salinity tolerance cultivars of rice, wheat, maize and so on. We're looking at new information systems, new ways of providing farmers with knowledge and information. IT services partnering with local extension units.

The project puts a lot of emphasis on new partners for development, getting the private sector more involved in the agricultural sector as a profit center. It's not an easy thing to do. And it's been neglected for many years, but it's part of the project and we're making some very important headway and of course new policies to really incentivize change and increase investment in agriculture. The targets for this project are ambitious, but it's expected that some of this will definitely stick, will definitely catch on.

And let me point out three key elements of what CSISA is doing, what the solutions are. Based on really what we've learned from Millions Fed, one of them is that we have to invest in a range of crop management techniques, improved cultivars and equipment, both high tech and low tech for farmers. And I want to point something out here that I find very compelling in being part of this project. This may not be rocket science. Farming may not be rocket science, but it's pretty close. That sounds a little odd, but let me give you an example.

Zero tillage or conservation agriculture practices require – they're very knowledge intensive. They require real understanding of how you do your

farming. You have to be highly skilled and I would argue well educated to pull this off. And you have to be supported by the right hard and soft infrastructure.

So for instance, the idea that zero tillage or conservation agriculture increases wheat yields is a general statement, but if you look at this graph here, the increases in wheat yields you would get from using conservation agriculture, which is the blue line there, depend acutely on when you plant. And if you plant – let's take this line here. If you plant instead of on the 26th of November your wheat and you then plant on the 5th of December and you miss it by – that's about a week, right? Ten days. Your yields are no better than if you use traditional practices.

This is very sensitive stuff. I would argue that this is almost rocket science. So having really well educated, technically competent farmers and extension services and information providers is essential to making this work.

Another part of solutions that CSISA is focusing on and this is very much an IFPRI related topic is understanding the macro environment. You know we assume that in India or other South Asian countries that there is just not enough food. And we know that that's not true. In many years there are in fact surpluses of food in India. The issue is rather the distribution of food and of course the quality of food and the diversity of people's diets.

And sometimes it's simply an issue of excess supply in one year leading to a contraction in prices and then a decrease in supply in the next year. Sometimes the issue is policy, the incentives that cause farmers to plant too much or too little. And you saw that with rice production in India until they adjusted what they called a minimum support price. The minimum support price had been stagnant and in real terms declining for so long that farmers started shifting out of rice and into sugar cane. So of course you had an increase in the price of rice and an in order shift of the supply curve, that is there wasn't enough rice in India.

So getting those policies right and incentives right are really essential. And I won't go into the details of this graph. Just to show you that a handful of

estimates of food surpluses and deficits in 2000 will give you very different results. Some experts said there's not going to be enough food in India in 2000. Some experts said there's going to be too much food. So understanding the macro environment and getting it right is essential.

And then the third solution that we're working on in CSISA is really about getting the design and implementation of policies right. There are many encouraging policy initiatives in India and in Pakistan, Bangladesh and Nepal that are geared towards accelerating the growth of agricultural output and productivity. But in India as elsewhere, implementation and execution of these policies is a really big issue.

Some policies have done pretty well. The National Rural Employment Guaranty Scheme for instance by all accounts has done well than other entitlement programs that India has invested in in the past. Others are still out there to be judged, such as the plant varieties and Farmers Rights Act which is essential to encouraging the private sector to invest in improving seed or improving plants. We don't know if in fact infringement cases on intellectual property rights will be prosecuted in the Indian courts because there's no precedent as yet. So you know those types of policies are really important to understand both in terms of their design and implementation and CSISA tries to take aim at all of these.

Just two more slides and I'll wrap up. You know my thoughts at the end of the day and I'm being quite frank here because I feel that this is a comfortable and inquisitive audience. You know, solutions to hunger and malnutrition are not simply about supply. Availability, access and quality all matter. And in fact, IFPRI is sponsoring a major conference at this moment in New Delhi on the tie-in between agriculture and nutrition, which apart from some work that USAID has done has really been a neglected dimension of food security. The quality of food and the nutritional content of food is a real growing issue on our agenda.

The second point is that you know, science and technology, it's sexy. As Americans and I'm an American, we often find it to be our best solution to all challenges. You know, bring science and technology to bear and we'll solve everything. But really there are no silver bullets here. In none of the Millions Fed stores nor in CSISA are there any silver bullets to work from.

Markets are also sexy for lack of a better word, but as your own colleague, Dana Dalrimple from USAID who is I think now retired though some of you may know him. He's explained in his extensive body of work for the agency that public goods matter. Markets work under some circumstances. Markets don't work under other circumstances and investing in public goods is vital.

And you know my thoughts for the future and I think this is very in line with a lot of USAID's agenda is that innovation is really sort of the missing link on creatively integrating science, society, enterprise and development is how we find a multitude of solutions and create a multitude of successes. How do we do this? We've tried to answer that here, but I think there's still lots more questions than there are answers.

In looking to the future as my final point, I would say that more successes are needed. Hunger is persistent and new there are new stresses and new challenges emerging rapidly on the international landscape. But new successes will only occur if we keep food security and agriculture high on the global agenda. And the need to invest in agricultural development is more important today than it's ever really been before.

And you know we find it important to share these successes wherever we can and we've done this through a number of countries over the last year and a half. And we hope that you'll be able to do more. I know you have some parallel projects in this area and we hope that more emphasis will be given to agricultural development in ending hunger and malnutrition now rather than later. Thank you very much.

Male:

Thank you, David for that great talk. I will now open the floor for questions from both our in-person audience and our online audience. As a matter of sort of logistics we'll sort of alternate between our in-person and online audience as possible. Please remember to state your name and your organization before asking your question. And also realize that we're not – these mics don't actually amplify. They're just for the purposes of capturing your voice to put online so those on the online can hear us. So with that, any questions here in the audience? Online?

Male: Thank you, David that was a very informative and captivating talk. My name is Phil Steffen, USAID, the New Bureau for Food Security. Several of my colleagues and I – some are in the room – are grappling with an issue with one of the CSISA countries. That is how far can we push science and technology, seed variety and other advances without addressing some of the policy constraints such as uncertain government procurement policies and ambiguity for the role of the private sector and so forth? How much do these need to proceed in tandem or how far can we push one while waiting for the other to catch up? Thank you.

Male: All right, so that was captured by the microphone, right? Great. That's actually, you know my contribution to CSISA is precisely on that issue and some of the research we're doing on intellectual property rights, plant variety protection and the bio-safety regulatory framework in India among other countries and whether it's encouraging or inhibiting, the development and the delivery of new technologies for farmers. I mean I think the question of whether – you know you focus on getting the regulatory and the policy environment right or you focus on the technologies and hope that that pushes things forward or you do both or some combination is vexing. And India is not the only country that this has been an issue.

In many Sub-Saharan African countries we've seen the same thing, especially when it comes to food aid and things like that. I think in the case of say India, to take one example, there's an incredible amount of potential on the research and development side. There are private companies, multi-national and local companies that can do a lot of work on biotechnology, on conventional breeding and things like that and they really could push the technological frontier in the country like India quite quickly. But yes, the policy regime is lagging and they may just come up against a brick wall eventually and stop investing because it's not worth it to them if they can't get something out in the market because of an arcane or antithetical regulatory system.

There's no easy answer to that except to say that you know India's solutions have to come from India. We can provide the evidence. We can provide, we can invest in building the evidence, but it has to come from India. And in the case of genetically modified eggplant, in fact their solution was very grassroots sort of consultation on your, should this go into the market and ultimately on a

political basis they really said no, not on a scientific basis. So bringing evidence, scientific evidence to bear on the question to me seems like the best way to move this forward.

And you know we wrote one paper and we have a couple of others coming out for CSISA where we argue that with the respect of the role of the private sector in seed markets in India for instance, there's a lot of resistance to that. People are like, oh these multi-nationals are going to take over the supply of seed to small farmers. Multi-nationals aside, the private sector has driven some very important successes in the seed system in India. Pearl millet and sorghum, one of the success stories in Millions Fed is largely – well, it's a combination of public breeding but private seed multiplication, private investment in R&D and private marketing by seed companies.

And upwards of 70 – 90 percent of farmers who grow hybrid, excuse me, who grow pearl millet and sorghum in India buy their seeds from private companies. And these are some of the poorest farmers mind you because those are pretty marginal crops grown on pretty marginal lands by marginalized households. So there really is a precedent for success in this area. And I think we just have to help people recognize that.

Male: May name is Mark Andridium on the Water Team here at AID and I have sort of a comment and a question. Conservation tillage or no till agriculture, you generally – there's a risk to the groundwater. Are you monitoring that? Because for two reasons, one, you substitute herbicides for tillage and two, because you preserve the soil structure you get much faster transmission from the surface down into the groundwater. So I mean in other words nothing's an unalloyed good. Are you looking at the water implications?

Male: It's my understanding that the agronomists and the scientists who work on this are pretty thorough in their protocols, their research protocols and their field experiments and generally their fieldwork. So they should be certainly looking at the groundwater implications of zero till. And some of the other technologies like laser land levelers and direct seeded rice for instance that they're promoting through CSISA. I don't know enough about what the agronomists do day to day to answer that fully, but John McMurty again.

Male: Yeah, I mean - oh, gosh, it's something that they've looked at over a long period of time, the effect of zero till. I mean it's not something that's just happening under CSISA, you know, through the rice wheat consortium. They've looked at the kind of comprehensive effects of using zero till farming and there's lots of papers that probably address that question specifically. As far as particularly what they're doing right now in CSISA I don't exactly know, so.

Female: I have a couple of comments and questions from the webinar. The first is a comment that you might want to address and then I'll follow directly with the question. Tim Williams from the Peanut CRSP in Georgia says that, you said that innovation was the missing link. There needs to be strong incentives for innovation and an acceptance that innovation is risky.

And then a question from Jonathan Schryer at the Department of State Policy Planning staff. Jonathan says, one often hears statements to the effect of what worked in Mexico and South Asia won't work in Africa. What worked in China won't work in Central America. To what extent are lessons universal? To what extent do we need to develop tailored solutions in each country or community?

Male: All right. I can – I mean I think everybody here probably has better answers than I do to those questions. They're both very insightful and they're important. Innovation incentives certainly are part of the policy solutions we like to look at here. The very simple idea of intellectual property rights for plant breeders is an incentive to encourage breeders to innovate, to create new cultivars and put them out on the market.

The financial sector and other sectors of the economy are also key in promoting innovation by – for instance by providing venture capital funds or providing insurance services or reinsurance services the micro finance industry has looked at, things like that. So getting the policies right to create that enabling environment are absolutely part of the equation. The universality of lessons learned from Millions Fed and from our experience, our collective experience more generally, I think the answer to that is fairly straightforward.

Successes in one country under one context or circumstances have to be adapted. A lot of things actually don't replicate. There's the great example of – in fact, zero tillage when it was introduced in Ghana, I think _____ Global 2000 under the leadership of Jimmy Carter and others tried to promote zero till in Ghana and it didn't work and also Ethiopia where I was living until a few months ago. Also didn't work there. Why?

Well in at least some of these cases the problem was livestock. People keep livestock. Livestock eat plant residue, you know, the leftover stalks and stems and whatnot on the ground. And you need that to make zero tillage work. You can't let the animals eat it. So you know some things don't work. Other things, they definitely have to be adapted and revised and changed and made right. There's no doubt about that.

I think however that in a creative and innovative environment there are a lot of exciting things that can happen just based on learning between countries. The most interesting example is Brazil's investments in Africa right now or China's investments in Africa. Both of these countries have a vast amount of scientific, technical and social and economic experience in agriculture. And bringing their lessons to bear on some of Africa's problems gives us a lot more to work with in terms of content. So replicability and adaptation are important.

Male:

Good morning. Thank you for the presentation. My name is Mark Henderson. I'm an agriculture officer with USAID. I was in India a few years back and there was a series of mass farmer suicides. Basically they weren't making ends meet.

I saw some of your graphs that had a lot to do with yield increase, but that doesn't necessarily mean farmers are better off. So I was wondering if you could speak upon did you guys measure in the CSISA project how the change in family livelihoods? Thanks.

Male:

Sure. I mean we're definitely working on aspects of that as part of our monitoring and evaluation of CSISA. As an agronomist, we know that it's not only yields that matter, right? And it's not only change in income that matters. There are lots of other indicators to look at and we do look at those.

One of the interesting things about some of the technologies we were talking about in CSISA of course is that they're not in fact yield increasing technologies in many cases. They're simply cost reducing technologies. And in India cost reductions have become really important in the agricultural sector because labor costs especially have gotten very high as a result of things like the National Rural Employment Guarantee Scheme. Migrant farmers don't want to go over to, say, the breadbasket's a fun job in Haryana. They'd rather stay in their home states and home villages because they can get a guaranteed payout from the government, from the state. So they don't really need to migrate for labor.

You migrant labor is really tough work. Let's face it. So farmers in these breadbaskets have to figure out ways of replacing labor. So that's again one aspect of it. And if you actually look at the green revolution for instance, one of the key indicators there was also not yields, but incomes, and not incomes of farmers, but incomes of landless laborers in the agricultural sector.

They were the ones who benefited the most in fact because they ended up getting a double season in which to work and much more income. Labor was in demand. When yields are higher you have to work harder, things like that. So the point is that yes, absolutely CSISA and most projects that I work with look at much more than yield. You absolutely have to. Maybe from the webinar?

Male:

Addressing the specific thing that the concept of the farmer suicides, it's a very unfortunate thing, but IFPRI's done a very thorough examination and it's actually shown that it's a lot of misinformation going around that it was attributing farmer suicides to the introduction of BT cotton. And actually the suicide problem has actually gone down in the past 5 – 6 years since the adoption of a lot of these more modern technologies. It's unfortunately, it's a lot of – a very sad situation, but it's a lot of misinformation that goes around. And I'm happy to share with anyone sort of that very comprehensive IFPRI study looking at all of the actual reviewed studies that have showed that. So thanks.

Female:

I have another question from the webinar. This is from Natalie Semino. She is a public health nutritionist working with the World Wildlife Fund and Population Health and Environment projects. Her question is, I did not hear you talk about

strategies within your approach that really focus on nutrition. It is more and more evident that if you have a focus on food security through agriculture that you need a nutrition strategy or component.

If you want an improvement in the nutritional status of the population, you don't necessarily see an improvement in the nutritional status of a population, even if you improve and increase agricultural productivity and income. What is your approach to address this issue?

Male:

That's a very fair question which is why I said that the issue of food quality and nutrition is really the current or next frontier in agriculture. And USAID has particularly contributed on this front with the work of ____ and other programs. But let me take issue with at least one statement that increasing yield or productivity and output does not lead to good health or malnutrition or nutrition outcomes.

There's been a lot of research on that field and granted that increasing the consumption of just food staples and cereals has some nutritional deficiencies or relates to nutritional deficiencies in that kind of diet, but the very fact that increases and yields and output during say the green revolution brought food prices down so dramatically as to allow people to eat more was fundamental. It was fundamental to reducing hunger and reducing poverty during the 1950's through the 1970's. I don't think there are many people that would argue with that. Of course what I guess the question or the comment is, is what more needs to be done? And certainly a lot more needs to be done.

One of the success stories here that I found interesting in Millions Fed was on mung bean. You know mung bean is a legume crop or a pulse crop, whatever, and you rotate it between rice and wheat or wheat and rice in South Asia and China, in Southeast Asia, many countries. And it's a very good source not only for income because you can sell it to market, but also as a source of micronutrients and protein and other things that are essential to a diet, especially a heavily starch based diet that depends on rice or wheat. They compliment each other.

And getting the right cultivars developed and disseminating them to farmers and promoting their cultivation as a rotation between rice and wheat was really essential, an essential part of the success story there. So there are certainly examples like that. But even in that example, the nutritional consequences of that mung bean introduction were insufficiently studied I would argue. We didn't really make claims about its nutritional impact because not enough people had done the groundwork.

And the authors of that did some excellent research. A lot of them were actually involved in the effort, but I came back to them at one point and said, look. You can't make nutritional claims about mung bean until you guys send out your researchers and do some clinical trials and say mung bean consumption really does improve nutrition and under farmer or household circumstances, not in a lab. And I think a lot more needs to be done on that.

And the disconnect between the nutrition community and the agricultural community which again is the subject of this IFPRI conference in Delhi this week is wide. I mean that gap is huge and it needs to come a lot closer. And the issue of food quality and nutrition really needs to be further on the top of our agenda. It's not just about yields. It's just – and it's not just about cereals at all. And with that said it was a great question.

Male: We have time for one more question here in the audience.

Female: Hi. Thank you. My name is Vickie ____ and I work for the Washington office on Latin America VOLA. Thank you for your presentation and I look forward to reading your document. Just two quick questions. As an indicator of success of your stories, is combating or mitigating climate change one of the indicators for success?

And then secondly, I agree with you about the macro environment on policy. One thing especially looking at Mexico and Central America unbalanced trade policies where, that have increased food dependency on imports has been problematic and is that something you've been able to look at in your work?

Male: The first question about climate change, no it wasn't an indicator because we're looking back 50 years when climate change wasn't on the agenda. So we couldn't really set it up as one of our criteria for selection of a success because Norman Borlaug didn't know what climate change was when he started his wheat reading work. So we'd rule out a lot of successes if we did. Sorry, the second question was on?

Female: Capital economic policy or the macro policy environment and if you've looked at unbalanced trade policies and its impact on food security and policy?

Male: You know we didn't look at trade policy enough in this. But to give you an example of where we tried to extend the analysis by looking at trade was this issue of the success of zero tillage, soybean wheat in Argentina where Argentina adopted a whole new set of technologies through a very sort of diverse partnership of farmers and researchers and private companies and whatnot. And they boosted the world production of soybean substantially. Now soybean is a real important crop for both food and feed. It's an oilseed as well. It has lots of real inherent value.

It's very tough, though to make the leap from Argentina's success in say increasing work stocks of soybean and saying that okay, in China people are able to fatten pigs more effectively thereby increasing or dropping the price of pork and increasing consumption of pork, which may be a very good source of some types of nutritional elements. So in a sense we weren't able to look at that nor were we able to really look at the trade issues related to say NAFTA and in the case of Mexico and its impact on food security. Again just to say that in trade there are winners and losers. Often consumers and farmers have do struggle in those circumstances. So that's something that probably needs to have more work done on it.

And before I close, just one point I want to make about the last comment and this comment as well is that your – I believe she was director for evaluation at USAID, Ruth Levine, actually produced a predecessor volume to this called Millions Saved: Proven Successes in Global Agriculture. And that's where some of the real nutrition successes and health successes are documented. She did

that work while she was at the Center for Global Development. And we struggled with trying to find successes that bridged agriculture and nutrition.

We found one which was the homestead food production case in Bangladesh, but Progressa in Mexico for instance and a couple of other really interesting health and public health programs are featured in Ruth's work. And I encourage you certainly to look at that volume if you want to look more into this link or the absence of a link between health and agricultural development. So, are there more questions?

Male:

Well, thank you very much for joining us today for our second anniversary Ag Sector Council. We'll be sending out notices about our March Ag Sector Council once we get that lined up. I would ask you that if you could take a moment to fill out the questionnaire on your seats that help us to improve on our presentations here. For those of you online we'll send you an email with a similar questionnaire if you could please fill that out and send that back to us. We'd greatly appreciate it. And with that, again thank you.

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