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Panel Moderator: Roger Thurow

CONVERSATION:

SETTING THE STAGE: ONE BILLION HUNGRY - CAN WE FEED THE WORLD SUSTAINABLY?

Panel moderator:

Roger Thurow

Senior Fellow - The Chicago Council on Global Affairs

Panel members:

Sir Gordon Conway Professor of International Development, Imperial College London

Jane Karuku President, Alliance for a Green Revolution in Africa

Susan Godwin Smallholder Farmer, Nigeria

Gebisa Ejeta Distinguished Professor of Plant Breeding & Genetics & International Agriculture,
Purdue University

Introduction by:

Ambassador Kenneth M. Quinn

President - World Food Prize Foundation

I'd like to invite our next panel to come to the stage, and doing that, Roger Thurow - I knew him as the aggressive, hard-asking, tough questions journalist at the *Wall Street Journal*, and he'd be down having breakfast with Dr. Borlaug at about six o'clock in the morning and getting stories. And then he has transformed himself into a passionate, passionate advocate for the fight against hunger. And Roger, you'll introduce everyone on the panel.

And just want to say that sometimes really brilliant people like Roger and other guys like me have a thought or two. And last night watching the presidential debate reminded me that, when Xi Jinping was here he wrote and talked about some things, the same idea that I had. There's going to be a new president in China. There will be an election, and there will be a president in the United States sworn in in January. And the thought is - Wouldn't it be terrific if the new president in China and the next president in the United States would, as one of their first acts, meet - and of course I suggested here at the World Food Prize - and make a commitment, a commitment about putting the assets of both countries together in the great struggle to conquer and hopefully alleviate hunger from the face of the earth.

So with that thought, Roger, welcome, your panel, welcome, Sir Gordon, and over to you.

CONVERSATION:

SETTING THE STAGE: ONE BILLION HUNGRY – CAN WE FEED THE WORLD SUSTAINABLY?

Roger Thurow

Senior Fellow – The Chicago Council on Global Affairs

Moderator

Thank you, Ken. Yeah, all good thoughts, I think, emanate from the World Food Prize and from the minds of all of us who come here. You know, Ken, as a journalist, I really appreciated your anecdote about your meeting with Jeffrey Sachs earlier. What we saw on the screen was the quote from Jeffrey about the meeting, but I think it'd be really beneficial if we also had some visuals from that meeting. And so, interesting, at least. So if you can go through hour archives or your cell phones or something, see what you can dredge up.

Thank you, everybody, for coming – and the first time I'm turning around and looking to the back, and it's glorious and marvelous crowd. But I was thinking – I think the last time many of us gathered in such numbers was back in May at the Chicago Council on Global Affairs Symposium on Global Agriculture and Food Security in Washington, DC. And for those of you who remember, when President Obama spoke, he summoned an "All hands on deck" to us, an all hands on deck effort. And today our hands are back together. Again, we're part of a growing movement, gathering momentum that we're seeing. And again the World Food Prize just continues with that.

And we're making great progress on ending hunger through agricultural development, but the work ahead of us really remains immense, and we'll be hearing about some of that in this panel and then throughout the next couple of days.

For far too long the smallholder farmers of the developing world have been dismissed by governments, by development institutions, by the private sector as too poor, too remote, too insignificant. It was kind of this criminal neglect without extenuation that Dr. Borlaug had warned us all about when the Nobel Peace Prize back in 1970 – too poor, too remote, too insignificant. But no longer.

Dr. Borlaug, and indeed his great legacy here at the World Food Prize, always knew that smallholder farmers were at the core of our efforts, or should be at the core of our efforts, and they certainly are now – be they the efforts of Feed the Future or the Alliance for a Green Revolution in Africa, the efforts of an increasing number of corporations in the private sector, corporations both large and small, a lot of innovation, a lot of social enterprise really digging into this work; be it in the work of the organizations that I've had the privilege of being affiliated with or working with, like the Chicago Council on Global Affairs, the One Acre Fund, the ONE Campaign, OXFAM, the World Food Program, Action Aide, 1,000 Days, Foods Resource Bank, and all the organizations that you're affiliated with and that you represent; the work by our great universities, by researchers toiling in labs all over the world.

The smallholder farmers are at the core of agriculture development, and hooray for that – and it's something that we've long been talking about here at the World Food Prize. And not just increasing production of the smallholder farmers but increasing the nutrition and nutritious value of the food and the crops that they're growing as well. Because we realize that, to meet

this great global challenge that we're all facing, in coming decades of securing the world's food supply, these smallholder farmers are indispensable in achieving this. If they succeed, so might we all.

So you see kind of this grand irony that's emerging. These smallholder farmers who were so neglected for decades are now indispensable to us. Journalists love irony, so this is an irony that I really grasp and focus on.

So we've assembled a wonderful panel to set the stage, as I guess the panel is called, to set the stage for our talks for the next couple of days but also our task for the next couple of decades.

Sir Gordon Conway will start us off. Gordon himself is indispensable. Your work on the frontlines of this from various organizations throughout the years and affiliations, has been indispensable. And now he's Professor of International Development at Imperial College in London. Gordon has my deepest respect. I would call him "Sir" even if he wasn't knighted – Sir Gordon.

And then we'll hear from people that are actually doing the work on the ground in Africa and in the fields. Susan Godwin, a smallholder farmer from Northern Nigeria, Jane Karuku, the President of the Alliance for a Green Revolution in Africa, and Gebisa Ejeta, distinguished Professor of Plant Breeding and Genetics in International Agriculture at Purdue University, and the great center that you've established there, and also World Food Prize laureate himself.

So we'll start off with Gordon, who is also the author, as Ken had mentioned, of the new book, *One Billion Hungry – Can We Feed the World?* It's also, suspiciously, the name of our panel. So, Gordon, take it away. I suspect he's about to answer his question.

Sir Gordon Conway

Professor of International Development, Imperial College London

Thank you, Roger. It's great to be back here at the World Food Prize, great to be with this panel, particularly moderated by Roger here. Roger and I go back quite a while. We've had some good times together. I remember distinctly the two of us going into a bar in Chicago and being stopped for our IDs to see if we were old enough to have a drink. And I always thought that that was the nicest thing anybody had said to me in the last decade. It's typical of Chicago, of course.

The subtitle of this book is *Can We Feed the World?*, and the answer is yes. For those of you who have come simply to find the answer, you can now leave satisfied with that response. But, of course the "yes" comes with lots of "buts." And in the last chapter of the book we've got 24 qualifications to that "but."

But let me start by talking about the big changes we have right at the moment. There are three: Recurring food price spikes, the fact there is about a billion hungry, and that we have to increase food production by something like seventy to a hundred percent. And you've heard quite a bit about that last one in the last speech.

These are the food price spikes. We're about to go into a third one. We don't know what it's going to transpire into, whether it's going to be like the previous ones. There are many factors, and I'm not going to go into them because we could spend the whole day arguing about what's the most important factor. What we do know, and that's what's important, is that, when the spikes go up, when the prices go up and then they come down, they don't come down far enough in developing countries. And most important, these hikes in price are catastrophic for poor people who spend something like a half or more of their income on food.

We desperately need better regional trade, particularly in Africa; and most important, we need to produce more food. Often in recent years the supply of food has been below the demand.

And the second is the billion hungry. On Tuesday of last week FAO produced a new report that said it wasn't a billion hungry – it was 850 million. And my book was launched that day, and I got an email saying, "Congratulations. You've reduced hunger in the world by 150 million in one day." It's somewhere between 800 and a billion. And of course the 850 billion is for sedentary lifestyles. In other words, it's what you guys are all doing there now at the moment. Actually, really working hard, it's a much bigger figure than one billion.

Note in particular that in Africa the green line, the number of hungry is going up, and the red line, the proportion is going down but only very slowly.

The most appalling statistic in all of this is the 180 million children who are under height for their age, who are stunted. And because they're stunted, they go blind, they die, their development is retarded. And the critical period is the first thousand days, the period of pregnancy and then the two years afterwards; that's when you have to get those nutrients into them, in particular those micronutrients, vitamin A, zinc, iron and so on.

The challenges going forward to 2050 are enormous, and we heard a lot about them in the previous speaker. I'm not going to talk about them in detail, but I just want to pick up two or three points.

First of all, in the popular imagination, the real problem is the population increase, that we're going from 7+ billion to 9+ billion. But if that was all that the problem was, it wouldn't be such a big problem because agricultural development is growing at such a rate, it'll keep up with population. Much more severe is the fact that in many countries the incomes per capita are going up dramatically. In China, elsewhere in Asia, in India, in Brazil, incomes per capita are going up.

And as a result, people in those parts of the world are shifting towards Western-style diets. They're eating chips and crisps and bread and meat from beef and sheep and pork and poultry and milk and yogurt, cheeses and so forth.

And the point here is that very crudely, for every kilo of meat, you need about eight kilos of grain to feed the animals. It varies, of course, according to the system. But it gives you an idea about the huge demand for grain and for feedstuffs like soya that we're going to get into the future.

It underlines the fact that the Chinese government signed a deal with the Ukraine last week, providing three billion dollars in loans in return for imports of five million tons of grain each year.

And of course there is the competition for biofuels. Significantly, the European Union is probably going to pass a law that says a maximum of 50% of biofuel crops can be food crops.

And then there are all the supply factors, which I don't need to go into, but I just want to highlight the importance of climate change. There may be many skeptics in this country, and there may be many skeptics in this audience, but in Africa there aren't skeptics. Every time you go to a village, you say, "Is the climate changing?" Villages say, "Yes, of course, it is," and then they tell you how it's changing and they tell you what they're doing.

In the left there – reduction in the length of growing period. I was in Ghana recently. The rains came a month late and ended a month early; it was only a hundred days, only one rice variety would work. On the right side, average annual maximum temperatures going above 30 degrees reduces maize yields considerably. And we have extreme events such as in Russia and Pakistan 2010 and here in the U.S. this year. You can't prove that those extreme events are a direct consequence of climate change, but they're what the models of climate change you expect to have in the future.

So it's what we face. How do we cope? And we're really saying that in the book that there are four ways forward: innovation, markets, people and political leadership.

Innovation – Africans didn't invent mobile phones, but they've been extraordinarily innovative in the way mobile phones are used. Innovation is crucial, because into the future we're going to have to rely more or less on the amount of land we have now. We're going to have to increase yields on the same amount of land with less water, less fertilizer, less pesticide, less outputs of methane and nitrous oxide. This is a huge task, and it's why innovation is so important.

Just to give you one example, microdosing in Niger, where you take the fertilizer and put it in a cap of Pepsi Cola or a Coca Cola or what other cola you have and just put that in the hole where you plant the seed. It's a form of sustainable intensification. Oh, here the tree called *Faidherbia* which has the extraordinary habit of shedding its leaves in the wet season. It's a leguminous tree. You put maize under it, you'll get three tons per hectare because of the nutrients coming from the trees. And in addition, they will put two tons or more of carbon per hectare into the ground.

These are agroecological approaches. They're not magic bullets, but they are effective in some places at some times. But we also need modern plant breeding. We need to build in sustainability into the seed – more nutritious plants, more resilient plants. And the Holy Grail, of course, is to get basic staples – wheat, barley, rice, maize – to as it were fix their own nitrogen from the atmosphere.

Much can be done with conventional breeding. The orange flesh sweet potato that's got the precursor of vitamin A in it, can be bred conventionally. But in some cases you don't have the genes present that you can use in conventional breeding. And then you have to do genetic engineering, and you can see there golden rice on the left and golden bananas now being experimentally grown in Uganda.

We're going to need more genetically engineered crops into the future. And one place that's doing a lot of this is Uganda, and here is an example of where they're engineering bananas against wilt. What's significant about this work is it's entirely funded with public money. This is not a multinational corporation doing the work – it's Uganda and its own research organization.

Okay. Technology is one thing, but you need markets. You need markets where people can buy the seed and fertilizer they want. I always show this because that's my grandfather in the horse and cart up there, selling seed and fertilizer around the farms. And his modern-day equivalent is the lady in the agrodealer store, the pop and mom's store in the local village. There are thousands of these agrodealers being created in Africa right now.

And how these come together – this is an example from AGRA, Jane's organization. You've got the farmer in the middle there – he's the head of the farmer association; he's getting the information that he needs from a local research institution, the Savannah Agricultural Research Institute – and that's increasing his yields. He's buying certified seed from the agrodealer up in the top right, and he's got people to do deals with him. He's selling, in this case, his soybean through the Savannah Cooperative Association, so they're the ones that do the bargaining with the buyers. And they are also building a warehouse down in the bottom left to cut out the waste. It's an excellent creation of an enabling environment, using public and private money.

The farmer in the middle, the agrodealer over there on the right, getting seed from a local seed company, the many new seed companies springing up in Africa, the fertilizer companies getting microcredit from the banks, and selling through cooperatives or credit groups of various kinds to local traders and out to the market. Most important is the connectivity, the physical roads that are needed, and the soft connectivity, which is the ICT and the mobile funds.

And crucial to all of this are people and in particular smallholders – that's the theme that keeps coming up here – half a billion smallholders in the world. There will be bigger farms, more bigger farms in Africa and elsewhere. But for the next 20, 30 years, the food production is going to come from smallholders. And many of those, we need to remember, are women. Many of the farmers and the farm workers in Africa are women. Women are important because they are not just farmers, they are mothers, they grow nutritious crops, they make sure their children eat nutritious crops.

And women are also important as scientists and innovators. Just to remind you, Daphrose Gahakwa in the top right there, the great biotechnologist, was head of the Science and Technology Commission in Rwanda, was Minister of Agriculture in Rwanda. Bottom right, a young Ugandan woman whom I saw recently who pointed to the petri dish said, "I've got double haploid cassava in there." She's the first person, as far as we can make out, to ever produce double haploid cassava.

Bottom left, Maria Andrade, the great champion of orange flesh sweet potatoes – normally wears orange all the time but today seems to have been in black when I took the photograph. On the top left, Josephine Okot, the Acholi woman from Northern Uganda who created Victoria Seeds, the great seed company in Uganda. Tremendous women who are at the forefront of agricultural development in Africa.

And then finally – well, I’ll come to the finally – nearly the finally, people at the heart of the virtuous circle – greater yields, more prosperous farmers, more wage labor, less hunger, rural economy grows, more rural employment, more roads and markets, greater trade opportunities, agriculture develops. Important to remember that agriculture is at the heart of the development of the rural economy, which in turn is at the heart of national development. Agriculture has that special role to play, and if you get it right, that virtuous circle will continue.

And then finally, if you want to get it right, you need leadership. Remind ourselves at the beginning of the Green Revolution Henry Wallace was sent by Franklin D. Roosevelt to Mexico. What he saw made him believe that there needed to be a major program of agricultural development in Mexico. And he went to the head of the Rockefeller Foundation. Rockefeller eventually sent the team, including Norm Borlaug, to Mexico, and the rest is all history. It was that political leadership. We’ve got some of that leadership right now with President Obama, with Prime Minister Cameron, with the European Commissioner Piebalgs in Brussels – great leaders who are pushing agriculture.

But most important are the leaders in Africa. And here of course is our Prize winner from last year, President John Kufuor of Ghana, who between 2002 and 2009 vigorously promoted an investment climate for Ghana. And investment flowed in, and significantly it went into roads and research, other things too but primarily roads and research. The export crops grew and also the staple crops – the cassava and yams grew as well. And one of the consequences was that agricultural growth in Ghana went up by 5% per year for nearly 20 years, and rural economies grew and rural incomes grew; rural incomes doubled over that period. And to go back to the thread of what I’ve been saying, if you look at the orange bars there, the reduction in child malnutrition down from 30% in 1988 to just 17% in 2008. And Ghana is going to be the first African around country to achieve the first Millennium Development Goal.

So the bottom line of all of this is that we know what to do. We know broadly what to do. We’ve got most of the tools that we need to do it. We’ve just got to get on and do it.

Thank you.

Roger Thurow

Thank you very much, Gordon. Yeah, great presentation – slides, some scary, some optimistic, of what we’re facing. I particularly liked the slide, “People at the Heart.” So we’re really honored to have one of those people with us today, Susan Godwin, as I said, a farmer from Northern Nigeria. She is Gordon’s slides in the flesh and has come to tell us what’s going on on her farm and on the ground. She’s been honored as a food hero in her country, leading the way truly to the last hunger season. So, Susan, please tell us a little bit about what you’re doing on the ground on your farm, what your neighbors are doing, and the impact that it’s having on your children, on their health, their education, and for the whole community.

Susan Godwin

Smallholder Farmer, Nigeria

Thank you. Good afternoon, all. My name is Susan Godwin. I was born in a farming family. I got married to a policeman. I later joined him to stay in the city. After having my five children, I see my husband's money cannot be able to keep us; so I decided to go back to the village with my five children to go ahead and start farming. So when we went to the village, we were farming for about 12 years. We don't have even enough to eat, not more to give to others until when one of the OXFAM projects was brought to my community.

And the project program was all about capacity building for small-scale farmers. So when I had that, I quickly enrolled myself into that program so that I could receive the capacity building. I also grouped some small-scale farmers also in my community into groups. We have about seven groups of thirty members each. We received capacity training together.

Along the line, some of them decided to start receiving the capacity building training, because they feel that it was money that they were coming to share for us. So as for me, I keep on following. At times the program will be, the training will be in my community. At times it would be in the next community. At times they asked us to come to the state capital, which is Lafia, to receive the capacity training. So I was following them like that and some of the people were living around, they start talking, "This woman cannot longer do her farm work. She's just following these people about. We don't know what she wants from these people. These are people that just come with talk. They have nothing to offer to farmers, and she's just wasting her time following them."

So ... I wanted to stop. I said, no, let me keep going and see what will be the end result. So I put myself into that program. And when the program was ended, I started implementing what was taught in the program, because the first thing that encouraged me and where said I will not stop going for this program was that they say a farmer can adopt a new method of farming by using improved seedling, by improving the land. That farmer can get more food and can live better. I said I'd been farming for 12 years – I don't have anything to talk about. How will this help? And I said, let me put it into practice and see if what they are saying is true.

I quickly put it into practice. We were farming a specific crop on a specific piece of land every year. Of which they say we should not be doing that, that we should do crop rotation so that we build up the soil. So I quickly put these things into practice. And when I put it into practice, I see my farm was looking good, my crops, we have fresh, and I was getting more crops than them. Some of them started saying that this woman, maybe she has gone and received voodoo medicine so that you draw the people around her, crop into her own farm. Some were saying like that, but that did not stop me from what I was doing. I was doing what I was doing, and some that were wise enough, they quickly understand what way I was going so they came and they were asking me, "Madam Susan, can you please help us with this?" I said, no problem. I share whatever I have with them.

So for the fifth year after harvesting crop, one of the capacity building they told us was that in the little crop that we can get if we know how to add value to it, maybe it would help us to get more money. I said, since I harvested my crop and I'm going to get more crops, let me try and add value to the crop and see whether I can get more money. So the money I have, those told us

how to do village and saving loans, so that even if you have a little more and you don't spend it all but put something in the village and saving so that tomorrow you can use it to do another big thing. The money I got from the village and saving loan, and the money, I take some of my crop and save, I was able to buy a machine for shelling the peanuts that I farm. So when I bought the machine, I was using it for my shelling, and I was the first person in my community who bought that machine. So all the community people were coming to my house to do their shelling, to shell their peanuts. Even those living in the neighbor community, they would also come on their walk. So I was getting more money, and I opened my farm work very big again, because I have enough money to hire people to go and work for me.

So when I was doing that, the next two years I landed myself harvest six machine, not one. So in the six machine, as the machine we are many, I was not able to control the machines myself. So what I did, I employ those women that were around me to help me work, do the work in the machine. So what I normally do, when they work with the machine, at the end of every day, they bring what they have realized from the machine. When they bring what they realized from the machine, it was 2,200 that I would be giving to her as her take-home money. If it was 5,500, then I would be giving to half as a take-home money.

So that is how we have been doing with them, and it really has set the stage. Some of them, even where the machine are, in the process of shelling the groundnuts, some groundnuts would be escaping out, so they have access to that one. At the end of the day, some can even get up to three or four more to sell. But some did not sell their own like that; they prefer to gather it into much quantity before they will process groundnut oil out of it and sell the groundnut oil and the groundnut cake to have more money. Some do like that, and they also start their own business.

As they were going fine with their own business, some of them are able to buy machine, those who do work in the ... with me. Some of them were able to buy the machine for grinding, their groundnut too. Some bought for grinding, some bought for shelling. And when all them had gotten the means of their own market, they go and do their own separate. And those that don't have the means, they now keep on coming. So that is how we have been doing.

In the aspect of my farm work, normally when it is harvesting time, I normally announce to them that my harvesting time is going to be on Tuesday, so anybody that has the time can follow me and come and help me do my farm harvest. So when they come, after the harvest, what I normally do, I will fish out of what we harvested for that day for them. If it is yam, if there are plenty in the farm, I will divide 50/50 tubers to each and every one of them to go and plant on their own fields also. If there are not many, I do give them a hundred tubers to go and plant. So we have been doing that.

The women, when we started, some of them did not even have a tuber to plant, but today they can plant up to 1,000 tubers. And when I was farming, the yam that I can manage was only what, 4,000, but with the new technology that I have, in fact I can manage up to 10,000 groups of yam, and I will do it successfully without having any problem. So that was how we have been doing in the community. And now the community people are saying, "How manage? Oh, I will follow this woman, see how this woman is making them."

I was able to help my children and my husband too and my children, because when we were in town, my husband's salary alone cannot be able to give us food to eat or more to pay the

student's school fees. But with this I have money to help my husband pay my children's school fees. I think my first son, my first daughter, she's now doing her youth service in Osun state of Nigeria. Then the second born, her name is Rosemary, that is the first daughter. The second born is Belume so he is a graduate. He graduated last year, and now he has gotten a job with the Nigerian Army. He is doing his training in Kaduna, state of Nigeria now. The third born is Jene, he's a man also.

He's managing my shop. That is when many people have engine now. The market is not going as before, so I decided to open a small shop that I can be selling the machine parts. If the machines brought no money, even if it is 30 naira, you have to travel to the headquarters before you buy it, and the cost would be too high because of the transportation. So I opened that shop and buy the parts and put there; they come to buy it. So that my son Jene is managing that shop for me.

And the fourth born is Bea. Her name is Beatrice but people choose to call her Bea because she so much look like my mother-in-law. So my mother-in-law name is Bea, so they call her Bea not Beatrice. That one did not go to school. She choose to stay with me in the farm. So what I do for her, when I hire a land to farm, I also hire a piece of land for her also to farm her own crop. Whatever she get from that farm is her own; she can use it to do whatever she want to do.

So the last one, the last born is Lucy. She is now writing her final exam in one of the universities in Nigeria. She will be finishing her final exam on the 19th of this October.

So in fact I want to say thank you, OXFAM, for this improvement that you have bring to my own door. I thank you very much. My community people, some that did not have food to eat, today they have food to eat because of the knowledge I acquire from the OXFAM, and that has been helping me, and I am also helping them.

So when I got a letter that I was coming to America, I showed them the letter, that this is a letter that has been brought to me to come to America. They say, "America!?" I say, "Yes." "How manage? Do you go to school?" I know say, "No." "And how manage will you get to America?" I say, "I don't know. Maybe America will send somebody that will come and carry me." "If you go to America, what will you go and tell them?" "I'll go and tell them that I'm a farmer." So they were like saying "let the OXFAM people come", they would like to join so that they can come to America.

So thank you.

Roger Thurow

Thank you, thanks for your applause and your reception. This is a remarkable story. And just from the efforts of one farmer, you can see kind of the ripples through the entire community and her children and the long-term movement out of poverty from the hunger season from just merely surviving to robustly thriving. It's really something. And also a warning to all those skeptics and the people who thought that she was crazy by following this – you're sitting on a stage at the World Food Prize in the United States in Des Moines, and they need to, when you get back home, to be paying more attention to you. We'll come back to Susan in a minute, and then if any of you folks have questions...

But Jane, behind the success of Susan and other individuals, smallholder farmers, there's a lot of people, a lot of programs, partnerships that are involved in that, and at the Alliance for a Green Revolution in Africa, you're kind of on the cutting edge of all that. So kind of as you see Gordon's presentation here, Susan's story, how does the work of what you're doing and the innovations that you're seeing and fostering and supporting, how does that kind of fit into the individual successes?

Jane Karuku

President, Alliance for a Green Revolution in Africa

Thank you. I hope I can match this class act from Susan. But I think back in Africa we are seeing a lot of inspirational stories and inspirational things that are going on, very well described by Susan here. What we see is all the elements starting to come together, and I will describe in a minute what are these elements. And most of them I think Sir Gordon touched on them.

For us to succeed in this agenda of Africa feeding itself and indeed feeding the nine-plus billion people, I think we can do it. But the elements must be end to end and very well coordinated and very well integrated. I think Susan talked about capacity building. At the start of it, people have to be aware of what needs to be done, and sometimes we ignore that element of capacity building.

We should not take it for granted that somebody knows if I take a good seed. What is a good seed? We shouldn't take for granted that people know what is a good seed. We should not take it for granted that people know how to work with a good seed. So there has to be a lot of capacity building behind and at the start of all this work. Sometimes it comes to these farmers like Susan by accident, but I think it needs to be more intentional. And it's AGRA and other partners are working a lot on this.

And I'll give you an example of how it can come together as one of the successive stories that we have seen. And I want to talk about a banana story. Some while ago there was somebody, I think, from Rockefeller who funded banana research in east Africa, in Uganda or in Kenya and the biotechnology, walking together with some universities in Africa and governments in Africa. So you can see the elements starting to come together – the government and the research and some funding from some good Samaritans. And they came up with some good banana seed that was producing up to 150 times in terms of yield, and that was also very resistant to a lot of pests and a lot of the weevils that we were seeing here. And they went to certain localities, geographical localities, where they taught from the groups. Because Susan alone has got no voice, so we have to organize many Susans so they can have a voice so they can negotiate and also give themselves a platform of where they can access knowledge and money.

So the first thing is that they have got access to this seed. When they got this access to this seed, they were taught on what to do with this seed. Now the factor up stay with me, I think it's 15, not 115, up on the productivity. There probably was another 15 or 20 up because of their agronomy and their good practices. They were taught how to use good fertilizer as well as organic and how to take care of a scarce resource called water in taking care of this banana. And then they were aggregated in terms of their produce. And they built some aggregation centers where the banana is well taken care of. They were then taught that instead of selling, eyeballing for your big piece

of banana – because now the things were very huge; they were mostly taller than me, so huge – so weigh the produce before you sell it rather than selling it on eyeball. And the factor of production, price moved from one unit to thirteen units by kilo, so another factor of 15. So three steps already of value-increasing increment for the farmer.

And then there was technology involved, so because of the mobile influence in the countries in Africa, communication between market and the farmer is well-linked, and they're using more phones to make their order and also pay back, because money transferred within the mobile is a very big deal. So by itself today, if my farmer group chair says they have a hundred times requirement, so they'll collect from ten different people or a hundred different people aggregates to take together to the market, and then the markets guy, after he records this, he sends money back. So on the same day I sell my produce, I get my money on the same day, and the factor is way, way big.

So what has happened with this, like Susan is explaining, is that these farmers have not only improved food security for themselves and their environment, they've also increased their wealth, and they're able to do all the things that most of us in this room are able to do that could pay school fees for our kids, pay for health, and pay for other things like even building better shelters for ourselves.

There the element that came together was access to finance. So in the same locality there was private sector and the public partnerships that accessed finance to this group of farmers. Because they were already organized in farmer groups, so they were able to go in and negotiate credit because, Susan did talk about it, but I don't know whether she has collateral to go ahead and borrow money from a bank. In most cases, people don't have this collateral, so you have to rely on your farmer group or another innovative way of accessing this credit, maybe your circle or group finance. I mean, it gets very complicated and even interesting right there. So access to finance.

There was also policy that changed, so the government leadership changed policy in terms of how banana is marketed. Because we shouldn't take it for granted that I can go ahead and sell my banana in second markets. So these are policy changes that happened. There's also the farmer building capacity in terms of organization for them to run this thing as a business is also a very intricate detail that sometimes gets left, and this happened.

So if you look at this element alone, elements came together – the sustainability of the project in terms of water, fertilizer and the whole agronomical effects. You have technology coming in both at the research – somebody in the science lab worked to get to a better banana variety that went to these families. There was a government involved which came together to give these groups of farmers an enabling environment for them to work better at delivery of these farmers to the market. So there was the whole thing of infrastructure.

And there was the thing of access to market that linked these farmers, mostly from government enablers as well as the private sector enabling. Because there's something else that is called a broker in Africa. The brokers can be many – we shouldn't demonize them, but we'd like them to be fewer in the chain, probably one, not many. And there what you call the private sector, and when we talk about private sector, it's not necessarily the very big private sector but is just

people who organize themselves and are able to move produce from one end of the country or one end of the region to the other one.

So technology came on in terms of how do we get the financial transactions? People are at the heart of it, I mean, according to, I think, Sir Gordon talked about about the people being to the heart of it. So the banks are there, but the banks are, in my head, is that all these elements have to come together, and we have to work with public-private partnerships. Because one of the missing links is, how do we take Susan's story and scale it up to be bigger than a community of a hundred people to get to the big-league players where she can go regional as well as the whole country. And maybe in the future she can sell her yams globally. I think that's a challenge we have today, how do we scale it up?

Roger Thurow

Thank you, Jane. Yeah, I think a sign of "Susan's Yams" or "Susan's Peanuts" would be good in our stores? Right?

So as Jane was talking about this broad front that is needed, that stretches from the research all the way through the post-harvest things and the banks and the financing is so important, science critical to that. And Gebisa is one of the great experts to talk about that and from where he came from in rural Africa and the work that you've done on producing these magic seeds that are so effective. So how do we get the science that's there to work in the fields? And you often talk about a back-to-basics approach. So science's role and how we get that into the fields into the hands of farmers like Susan?

Gebisa Ejeta

Distinguished Professor of Plant Breeding & Genetics & International Agriculture, Purdue University

Thank you, thank you, Roger.

What you already heard with Sir Conway's presentation and Jane's presentation is a layout of what is needed both in science and programs. And I just wanted to in real terms, as Jane had indicated, and then the practice that you saw in Mrs. Godwin's presentation, how she benefited from introduction of science to effect a livelihood change in her community.

I just wanted to accentuate a little bit about the value of science and programs and that, because of past investments, we have significant, really sufficient signs around us to blend together with local wisdom and experience, as Mrs. Godwin had used her own personal intellect to benefit from these contributions and to begin to effect livelihood change.

These scientific results are found in the dusty shelves of national and regional programs in Africa and in computers and clouds of global organizations in the minds and brains of academics and scientists around the world – they are there. But still they're going to require adaptation and contextualization to fit into local problems, you know, to solve local problems. And that requires strengthening and building capacity, both human and institutional capacity in the local level and to build not only the research and technology delivery level but in the level that Jane was

describing, to put this, to move from scientific results to products and technologies and innovations that build enterprises and begin to bring about livelihood change.

I think that's where we have really slackened in the last few decades, because much of what has been gained was really as a result of those early investments in Africa where the developed world had come in, and both Europe and primarily North America and many of the African countries that happen to be benefiting as a result of that, came in to build institutions, introduced higher education, introduced agricultural research and what technology can do to change people, to change livelihood and communities.

So as a result of that, there was a significant number of leadership that has arisen in the continent that continue to serve the continent. And to the credits that both Dr. Conway and Jane had indicated, and that is that we are seeing good leadership emerging more and more recognition about the value of investing in development, the value of investing in infrastructure and so on. But about the same time that these kinds of local commitments are being made, I think the investments in institutional building and human capacity building has been really withdrawn. And so to be able to address some of these continual problems and finding more sustainable, permanent solutions is going to require a partnership with all of the global players around the world.

My own reservation that I would like to raise here is that there is this technical assistance industry in general that has grown, and many of that has really generated good voice concern about the poor in Africa. But I think in terms of converting that voice into action and helping solve these problems is going to require an advocacy to continue to build the human capacity and strengthening the institution, but also this industry recognizing that it's not about us – those of us involved in technical assistance programs – it's not about us getting it right; and it's not about us identifying what may be missing, and we need to bring that into the next paradigm and so on. It's not about us waiting until we get all the puzzles right. It is about them. It is about the Mrs. Godwins. It is about local programs that are there.

And so how can we connect the advanced research institutions that continue to generate fantastic research results – U.S. universities, European universities, the International Agricultural Research Centers, the regional programs, the other actors, the AGRAs and so on that are closer to working with national programs. How do we connect them? How do we create, really through partnerships including the private sector, so that we work together? We really have not done a good job in that.

And so I advocate this back-to-the-basics approach of building local capacity and local institutions so that the local institutions are ready and primed to benefit from the pipeline of science and technology and knowledge that is generated, not only locally but also from abroad.

So to the extent that we could make those kinds of adjustments we can build into these success stories that both Mrs. Godwin and Mrs. Karuku had shared with us.

Roger Thurow

Yeah, very well put, Gebisa. Thank you. To again, always be thinking – who's at the center? Gordon's people are at the heart. And I love it – it's not about us. And so it's not just about us up

here on the podium. We're happy to take some questions. There's two mics in the middle if you want to stand there. I'll take a couple of questions at once, just quick questions. We've only got about maybe about ten minutes left or so, so kind of no speeches or filibusters or comments. And if we could have maybe three or four people come up, we could take some questions.

Question & Answer Session

- Thurrow I just want to go back to Susan for a minute. You're in the United States. We ask big questions here. Gordon's question – Can we feed the world? Can Africa's smallholder farmers, yourself, your neighbors, feed your country, feed Africa, help feed the world?
- Godwin Yeah, we can feed the world if at all we are able to carry this capacity building to each and every local farmer in his community, and they get to adopt it. That is where we will be able to feed the world.
- Thurrow Optimistic. All right, so we have three people standing up. We'll take all three questions, and then we'll field them at once.
- Q I'm ... I'm from Iowa State University. First of all, I would like to applaud the panel. You have done a terrific job today. I really enjoyed this session. My simple question to Sir Gordon is – There is an alternate world operating as we are all trying to help capacity building, technology transfer, all sorts of things that we do in the international agricultural development. There's a whole bunch of civil society organizations that are equally active in different parts of the world who preach things completely opposite to what we are trying to tell the world to do. And they work at cross purposes, and they have been quite successful in influencing local governments in adopting some of their ideas. For example, one thing they say is – there is no need to increase agricultural production in this world. There is already plenty of food, and these people who are greedy who don't share with the people who don't have it, and that is the problem. You know, these kinds of things. I'm sure you've heard these kinds of things. I'm sure you have heard these kinds of things. How do we overcome those kinds of resistances? Because if we don't tackle them effectively, I see that in countries like Southeast Asia, like Laos and Cambodia, Bangladesh, even in India to a large extent, some of our purposes are not reaching the people because the politicians are listening to them and shaping policies, public policies.
- Thurrow Thank you. The two gentlemen in the back.
- Q Patrick Benz with Westbrook Associates. Several speakers have encouraged the expanded use of GMO crops as a new technology and new plant varieties. I'd be interested to your response to the fact that current trends show that leading biotech firms are now applying for patents not only for the proprietary rights to the germplasm in the seed but also to the post-harvest genetic trace material in foodstuffs like grains, meals, oils and such. I'd be interested in your response to – Do you feel that it is justifiable that the biotech industry can claim ownership of genetic materials in post-harvest materials in the food chain? And secondly, if these firms are to charge licensing fees to buyers of these materials, won't these impose a new economic disadvantage on farmers who use those products?
- Thurrow Answer.

Q The stereotype of American farmers and producers is that we are less attracted by the opportunities of innovation than we are the fear of failure if we do try to innovate. So my question for Susan is – in the light of Howard Buffett’s comments yesterday, that farmers have on average 40 chances to get it right in their lifetime, how can you help us in the United States systematize a process whereby every one of our farmers and producers try something new on their land every year in an effort to get a little closer to being right?

Thurrow Thank you. Let’s start with that. Susan, do you have any advice for American farmers? Don’t be afraid to innovate. Don’t be afraid to fail.

Godwin Well, I think the American farmers already are well-to-do because they have all the techniques. When I come, I was taken to most of the farm. I look at the land that they manage, is very small, but they are getting a lot of money out of it. They are getting because what they normally do, after producing, they try to add value to what they have, what they are producing before they sell. And that gives them a lot of money. But down to us there in Nigeria, it’s not all farmers that has a system adding value to whatever they are doing before selling. So I think in America people have the new techniques whereby I will also want to learn more and more and more so that when I go back to Nigeria I will help my community people. Thank you.

Thurrow I think it’s fascinating from your earlier comments of the other farmers, kind of watching you and watching what you’re doing, and so I’m thinking that you’re crazy, but in others now following what you’re doing, from my travels and reporting on this around the world, it’s remarkable that farmers, be they in the United States or in Africa, they’re all the same, and they think the same. What’s the farmer next to me doing? That’s why you put signs in front of the fields of what kind of seeds are being grown there. What’s that person doing? And so I think you’re a great example of that, that in your area of Nigeria, everybody’s kind of watching you – what’s Susan doing?

So you guys, any comments on the more scholarly or scientific questions?

Conway I’ll go to the first question. You can go to the second question.

Thurrow Yeah, Gebisa does the GMO one, right?

Conway You know, there is the issue of, actually, there’s enough food in the world if you just divided it up, which is true – if you took all the food in the world, divided it up into each person, everybody would have enough. It’s true of money too. You know, if we all put our money in a big pot and divided it up, there would be no more poverty.

? That’s a question for debates.

Conway But the issue is this – and we’ve heard it very well from Mrs. Godwin – what is needed is for small farmers, farmers with one or two hectares, and particularly in Africa, to be able to produce enough food to feed their families. That means they’ve got to produce three, four, five tons of maize per hectare. And we know they can do that, given the right seeds and the right fertilizer. All over Africa farmers can do that kind of production.

And then with that kind of yield, they can also sell on the market, or they can put part of their land into bananas or coffee or tea or whatever else it is. And that way they become relatively prosperous in the way that Mrs. Godwin has done. And that's called "development," and that's what we need to be doing. That's what we need to be moving forward.

Now, I know there's disparities between what some activist groups say and what some scientists say. I think there's a way of going forward, and that is this notion of sustainable intensification. Many people, many activist groups say – sustainable intensification, okay, but it has to be agricultural ecology. Now, I'm an ecologist, and I love ecology, and I love agricultural ecology, and it can do a lot; but it's not a sole magic bullet. We are going to have to also have new forms of crops produced by modern breeding of all kinds, not just genetic engineering but other kinds of modern breeding.

And what we really need is a partnership between those who are talking about agricultural ecology and those who are talking about modern plant breeding. Both of them put the sustainability front, right in the front, either in the field or in the seed as it's going forward. And I'm seeing, particularly in Britain, this dialogue is occurring between these two camps, if you like – and I think that's a way of going forward.

Ejeta So you're passing that second question to me, right? Okay. I will take it with the proviso, understanding that the person who asked the question fully acknowledges that I am not a patent lawyer. I think, and personally as well, I have never been a friend of patents or licensing in the biological technologies that we have been dealing with. But I think that's a reality that we have lived in. And since 1985, since the utility act was extended to include biological events, particularly plants and plant breeding materials, there have been significant investment; and so those investments needed to be protected, and so the patents have been issued.

The implication of that is the agroindustry has really benefited, farmers have benefited where those technologies have been made available – and they exploited that. But what we lost in the process is the fact that we are not sharing the natural resources that have been made available to us by nature through times immemorial through interventions of people as we used to in the past. And that is to say that, with the Plant Variety Protection Act that we had in the early days, and so an industry's investment was protected with that variety, but yet those varieties were utilizable without, by other scientists to make further improvements that would help humanity at large.

But now I think what was built into the question that was asked – how much of that is true, I really don't know. I think if that was... I can't see what, if that statement that was made was absolutely true. But what I know is, if a particular product has been generated as a result of private sector investment, yes, the private sector investment is protected, not only by the variety that was generated but also all the products that that investment had contributed to. For example, if the grain, whether in soybean or in a particular cereal was generating a certain product and that product was connected to

the discovery that was made in the process, certainly that was an investment that was made, and that's protected.

So that, in my opinion is not something new, but it's an evil – if I may call it an evil – it's something that we have learned to live with. It's not the old way; it's a new way. And I don't think there is a way to go back to where we were. There have been pluses and minuses that have come with it. As I said, tremendous investments have come from the private sector to exploit things that we have not been able to as a result of the new technologies that have come, so humanity has benefited from that as a result.

But at the same time (and there is more that could have been done to share those resources on a global scale), that adjustment, whether that comes by other philosophical dialogue, the generosity of programs that Sir Gordon Conway had created when he was president of the Rockefeller Foundation, the African Agricultural Technology Foundation, that have generated some potential utilizations that have come out whereas negotiations have been made with industry about some technologies being made available so that those are extended to developing countries – those kinds of things may need to be developed. But I don't think we're going to go back, but we continue to role with the punches and continue to find ways to bring technology to the greater humanity at large.

Thurrow Thank you. Jane, did you have any thoughts on that or either of the questions?

Karuku I guess it's on technology. I'll say that if you think about the African farmer, smallholder who is at the heart of this discussion today, they are looking for something better than their mother or their grandmother did. This is not from their perspective very technologically advanced, because it's a few steps at a time. So biotechnology, the banana example I gave, a sorghum plant that is resistant to striga, like Dr. Gebisa worked on, this variety that is producing five times better than the one they did the year before that is more growing in three months instead of six months because of climate change – that's what they require. So at the heart of this debate I think we need also to be practical – what exactly are we talking about? Is actually back to the basics. And it's very simple things that are done in a national institution research by either an African government or a great scientist like Gebisa. That's what I would say there.

Thurrow Yeah, thank you for that. That's what I was thinking. Whoa, our countdown clock has stopped, so I'll leave the last word with Susan. In terms of this, what do you and your neighbors and the farmers in your area talk about? Or what are your considerations in terms when you think of seeds and soil nutrients and things? Kind of, what do you talk about, that you would like whatever the best is available out there to help you produce?

Godwin The farmers?

Thurrow The farmers, right.

Godwin Well, the farmers in my community, when they adopt the new seeds to farm, so when I brought the new seed for them, that this is the improved seed that we need to go and

purchase, some of them thought that these seeds are not the good ones that they are supposed to plant. Normally the seeds are not as big as the older seed that they had before, so they would prefer to farm that one. And that one takes a longer time before it is mature in the field. But this improved one takes shorter time and give more yield too. So they don't find it easy in my community to adopt something that come unless they believe in seeing things before they come.

Thurrow Seeing is believing, no matter where. So, Gordon.

Conway I'll just say something quickly at the end. I think many people may, listening to us, think – goodness, it's terribly complicated, trying to make all this happen. But I hope that most people will see that actually there are clear routes forward and are real priorities. And if you rely on the capacity of African smallholder farmers, men and women, you can make a real difference. And can I just also as a little advertising here – the book when we produced it went to the publishers a year ago, so it's a bit out of date. But we've created a website called “CanWeFeedTheWorld.org,” and that has gone live now, and you can go into that, and you will see updates for every one of the chapters with new blogs that will become, I hope, a source of information about how we move forward in this great fight to create food security and agricultural development in Africa and for the developing world. Thank you.

Thurrow Thank you, Gordon. Yeah, anybody who has written a book knows you've got to, we're in a world that we've got to sell it ourselves, so excellent for that. Yeah, thank you very much for your attention, for your applause, for your laughter, for your warmth. It's been a really good panel and a great crowd. As Ken said, Gordon and I will be outside, out there at a table signing books. And, yeah, whatever his .org is, and TheLastHungerSeason.org – follow us on Twitter at @RogerThurrow, @Gordon, whatever, Sir Gordon, so thank you.

Ambassador Quinn

Thank you, thank you. So let me invite you all up, and we'll get ready for the next session. Susan, thank you for coming so far and being here. And next time my suggestion is – write a book, bring it here, and we'll be marketing, because you've got a lot of insights and a lot to offer. Another round of applause for our panel. But don't go out to buy their books yet.