

2013 THE "BORLAUG DIALOGUE"

October 16, 2013 - 4:00 p.m.

Panel: *Sir Gordon Conway, Moderator*

PANEL:

SETTING THE STAGE: TAKING STOCK AND LOOKING AHEAD

Introduction:

Bian Li

Director of Planning - The World Food Prize

I'd like to invite the next panel and our final session to take the stage. This session will focus on Setting the Stage: Taking Stock and Looking Ahead. It will focus on the future landscape of feeding a growing population in a world affected by environmental, geopolitical, technological and other pressing challenges. We have convened a diverse panel today, representing perspectives from private sector, NGOs, international research centers and academia.

And before we start the conversation, I would like to take care of a few housekeeping items. Please stay seated for a moment. I have some very important details to share with you. First of all, the symposium attendees are invited to our special ceremony presentation of the Inaugural Norman Borlaug Award for Field Research and Application, which is endowed by the Rockefeller Foundation. The award ceremony begins promptly at 5:30 p.m. in the Hall of Laureates, and a reception will follow. We will provide transportation for everyone to the Hall of Laureates. Buses will be available to board at 5:15 just outside the Marriott lobby on 7th Street and will run continuously from the Marriott to the Hall of Laureates until all attendees have been served. Following the ceremony and reception, three buses will run from the Hall of Laureates to the Marriott and Hyatt, and one bus will transport guests from the Hall of Laureates to the Hotel Fort Des Moines and the Renaissance Hotel. Please note - and this is very important - your name badge is required for all events at the Borlaug Dialog, including tonight's Borlaug Award Ceremony and reception. So please carry your name badges with you at all times. We very much appreciate your attention to this matter. In addition, tomorrow morning the symposium doors will open at 7:15 a.m. We will have a heightened security tomorrow morning, so we'll have magnetometers. Please arrive early enough to get here on time. And remember you must wear your badge and be prepared to present a photo ID.

To continue with our session and our final session to close the opening day, I would like to introduce a very, very wonderful friend to the World Food Prize and a member of our Council of Advisors, Sir Gordon Conway.

Sir Gordon Conway is a Professor of International Development at the Imperial College London, and he is one of the world's renowned scientists and thinkers on sustainable development. He is trained in agricultural ecology and attended the University of Bangor,

Cambridge, West Indies, and California UC Davis. He's been a pioneer of sustainable agriculture, developing integrative pest management programs for the State of Sabah in Malaysia. And among the other many reports and conferences he's chaired, he's coming out with the Montpellier Report, which he will talk more about, and he will set the stage for the next two days of our conference. So please join me in welcoming Sir Gordon Conway. He will make some remarks, and he will then introduce the other panelists. Thank you very much.

PANEL:

SETTING THE STAGE: TAKING STOCK AND LOOKING AHEAD

Panel Moderator:

Sir Gordon Conway

Professor of International Development, Imperial College London

Panel Members:

Tim Hanstad President & CEO, Landesa

Kijoolu Kaliya Pastoralist and Community Leader, Maasai

Claude Fauquet Director of the Global Cassava Partnership for the 21st Century, CIAT

Beth Keck Senior Director, Women's Economic Empowerment, Walmart

Sir Gordon Conway

Thank you, Bian. The future is about sex, but it's also about diversity. And we bring you a wonderfully diverse panel here to tackle this issue of where we are and where we're going into the future. So I'll introduce the panel in a minute, but I just want to start off by doing a short presentation about where we are and what some of the challenges are into the future.

So it's setting the stage. If we look back, we can see what happened at the time of the Green Revolution. We got massive increases in food production and in increase in per capita of food, but that's died away in recent years, the per capita has, of course in large part due to population increase. And so we're in a situation where we actually do need more need for a variety of reasons. And it's in a context, and this is the context today, of multiple crises – food, water, energy and so on – and all these crises are building and working on each other, more interconnected, creating maybe in our lifetimes but maybe in the lifetimes of our children and grandchildren, a perfect storm.

There are three interconnected challenges, which I think everybody now is familiar with. We've got rising prices, recurring food price spikes; we've got about a billion people hungry – FAO says 840 million, but it's actually probably higher than that; and we've got to increase food production by 60 to 100% by 2050; that's a huge challenge just on its own.

You can see the food prices going up. And probably the worst statistic at the moment is the fact that one in three children under five are malnourished. In Africa it's 40% of children under five who are malnourished. And as they're malnourished, they grow up stunted, they may become blind, and they often die. That's a complete blot on our reputations, if you like, of people who are involved in agricultural development of one kind or another. How can this be true still today?

And the challenges we face in 2050 include challenges of demand, population, diets, biofuels, chains of supply, rising fuel prices, climate change, land and water scarcity. The most critical one really is the land and water scarcity. We don't have a lot of new land, we don't have a lot of new water; we've got some that we can rely on. We've got to take the existing land and produce more food and more agricultural development on it. We have to intensify, in other words, particularly in Africa. Yields are beginning to go up in Africa, but they're still very small. Average yields in Africa are one ton per hectare or less of, say, maize or corn. The average yield in Iowa for maize and corn is 11 tons per hectare – that's the gap.

Good example of intensification is the orange flesh sweet potato, a great pioneering effort by an African woman, Maria Andrade, who is today's modern Norman Borlaug. She even used some of the same techniques of shuttle breeding to produce varieties of sweet potato in only four years instead of eight. But what she really carries is more than that, something again which is like Norman Borlaug. She's a great breeder; she's also a great implementer – she knows how to get these products out to farmers; and of course she's a great saleswoman, tremendous saleswoman. You can only go with her to see the fields if you wear a yellow and orange shirt.

So we need intensification, but we need the intensification to be sustainable. We need to produce more on the same amount of land or water, with efficient and prudent use of inputs. Minimize the emissions of greenhouse gases, increase natural capital and environmental services, strengthening resilience, and reduce environmental impact. It's a tall order. It's a challenge that is greater by many magnitudes than the challenge we've seen in the past.

Precision farming is one answer, where you put fertilizer in a small hole instead of spreading it all over the land – you've got less pollution, it's much cheaper, you get higher yields. We can use ecological ways of going forward. We can use genetic ways of going forward. We can use socioeconomic ways of going forward. Each of these has to be sustainable. Conservation farming, which everybody now knows about, is a good example where you don't till the land, the stalks lie on the land and rot down, increase the structure and quality of the soil, and you simply plant next year's maize or whatever it is, in among the stalks that you've laid on the ground. It's a sustainable ecological approach.

We also need sustainable genetic approaches, which may be through conventional breeding, they may be through marker aided selection, or they may be through GM. Most important is to build this capacity to be sustainable and resistant into the seed, as an example, a gene called a chaperone gene, which allows plants to recover from drought or any other kind of stress. So it's a resilience gene which you're building in.

And then we also need socioeconomic intensification. And there the trick is to find associations of one kind or another, whether they're co-ops or anything else whereby farmers can come together and gain more of the value added. So they're also about value chains, which we're

going to be talking about later on. Also included in this is the issue of land tenure, which we're also going to be talking about.

And then finally – and that's what we're going to I hope end up with – is talking about going to scale. How do we take innovation to scale? I'm optimistic because of what's been happening in Africa recently. We have the Comprehensive African Agriculture Development Program in which countries are designing new development plans in agriculture, and those plans are being funded, and they're giving countries a great deal of self-confidence about the future. There are real champions in Africa for agriculture. Joyce Banda, the president of Malawi, is one such. So that's all happening. And at the same time there's a lot of new funding coming from USAID, Feed the Future, coming from European countries like Britain and France, coming from the European Commission, which is a huge funder of agriculture. Also coming from the Rome agencies, which are highly revitalized at this moment – the World Food Programme, IFAD and FAO – more money coming in now to agricultural development. And finally of course the private sector, a great interest in the private sector both within developing countries and outside to invest in agriculture.

So that's just a little bit of uncertainty here. We're not going to tackle all these questions, but we're going to tackle some of them, and that's what this panel is about.

So if I introduce you across the panel here, first of all we've got Tim Hanstad, who is the CEO of Landesa, which is an NGO with considerable experience over the years, I mean, decades of experience working on land tenure, and that's what he's going to be talking about.

Next to him is Kijoolu, Kijoolu Kaliya, who is a Maasai woman from Tanzania, who is a local community leader; and she has had a highly successful fight against a takeover of her land by investors from outside Africa. So she's going to talk about what it's like to try and preserve your rights to your own land. And she has a terrific translator with her, Mrs. Missy Selimu, of OXFAM.

And then we have Claude Fauquet who is from CIAT in Columbia. Most of you, I think know about CIAT. He's the director of the Global Cassava Partnership for the 21st Century, and he's going to be talking about the development of new cassava, the development of cassava food chains that he's been working on.

And then finally we're coming to Beth Keck from Walmart, and she's spoken here before; and in fact I've been on a panel with her before. But she's now the senior director for Women's Economic Empowerment, and she's going to be talking again about value chains in terms of Walmart. She's going to be talking about women's empowerment issues as they're addressed by Walmart.

PANEL DISCUSSION

Gordon Conway So it's a diverse panel and it's a diverse range of topics, but they're all crucial topics to the future. We could continue having more of these panels, and we are going to have more of these panels, that carry forward

this kind of dialogue into the future. So I'm going to sit down now, and I'm going to ask Tim to start off with a few minutes. Each of them are going to have about four or five minutes to talk about their own experiences. I'm going to ask them some questions, and then we're going to try and have a dialog. We're going to end up by talking about going to scale, because I think in some ways that's the most interesting of all the things we can say. Thank you.

Tim Hansted

Well, thank you, Gordon, and it's a pleasure and an honor to be here today. And thank you for setting the scene. I guess I'd start by saying I would assert that our food security problems are not primarily production issues. They're primarily about power, and they're primarily about access and rights to resources, and land being most important among them.

And if we are going to sustainably intensify, as you point out, on an existing land base, then making sure that land policy and land tenure that defines the rights between the producers and the land is going to become increasingly important. You know, it's a cruel irony that agriculturists comprise the largest portion of the poorest and most food-insecure people on our planet. And for those agriculturists, their poverty, their productivity, their food security is intimately tied to the nature of their relationships to land. We roughly estimate there are about one and a quarter billion poor rural people who depend on land for their livelihoods but who lack secure legal rights to land. Most of them are smallholders or landless farm laborers. The vast majority of them are in Asia and Africa, and most are women.

On the smallholders – just let me address that for a second – I think contrary to the conventional wisdom, a very substantial portion of smallholders in Asia and Africa lack secure land rights. And the uncertainty that that creates for them then creates an incentive framework that leads to suboptimal planning and suboptimal situation where they don't have the incentives or the ability to make the long-term investments that might be needed.

For landless farm laborers, here this population among the absolute poorest and most food-insecure in the world, the vast majority of these in Asia, the threshold issue here is getting access to at least some land, a fraction of an acre at least, enough to have a kitchen garden and maybe raise some animals. And again within both of these groups, women are the most vulnerable, and of course as we've heard from earlier panels, increasingly involved in agricultural production, in fact doing the bulk of it in many countries. So women's land rights need particular attention.

Now, these land property rights issues are structural issues, and as such they require structural solutions. But the solutions are out there. They're underfoot, and they're often not as politically controversial or as complex

as many assume. And those solutions, those land rights systems solutions, they're not a silver bullet for food security, but they're a foundational part of the solution, and too often I think we have a blind spot about them. Too often they're either ignored or not recognized as a problem or kind of put aside, even if they're recognized because we think the solutions are too complex or too difficult. And I would say that, from Landesa's experience in more than 50 countries around the world, partnering with governments to help build and implement policy and legal infrastructure that provides secure land rights to producers, what we've learned from that is that solutions out there are not only absolutely necessary but they are present. And I hope we can get into that later.

Gordon Conway

Thank you, Tim. You know, we've been talking before we came in here, and I suddenly realized that I, like many people probably in the audience think, oh, yes, land rights - they're important. But what you say they're not just important, they're a basis for us going forward, and if we don't address them, we're not going to get the intensification of land production that we need.

I think the other thing is that in the West we tend to think about land rights in terms of our own land tenure systems, and they usually are the Anglican or francophone-type land systems, and we're used to those. But in Africa and Latin America and Asia the land rights are often traditional; they're quite difficult to understand if you're an outsider. I mean, you have experience. How do you cope with land rights that are really very different in style from those in the West.

Tim Hansted

Yeah, well, there are no cookie cutter solutions - I can say that. I can also say that it's never a good idea to export a land system from one country and place it in another, which has largely been done in much of Africa and actually much of the world. And that has actually created problems because you have a system that was designed for a place that had its own complex set of history and politics and social systems, on one that's completely different.

So what you find in Africa, for example, much of Africa, and then excuse me for generalizing, is throughout much of rural Africa customary land tenure systems dominate. You have a formal system that was placed by colonial rulers on top of that, so you have some pluralism. And I think largely what's needed is formalizing the customary systems in some way, as recognizing what the rights are, building off the richness and the strengths of that system, not necessarily adopting it wholesale, because many of those systems don't recognize the rights of women - so it does need some adjustments. But it's not necessarily a Western solution.

Gordon Conway

That final point that you made about formalizing the traditional systems, I think, helps us lead into Madam Kijoolu's experience; because she, as a Maasai, lives in an area, the Loliondo Game Reserve, where they have

traditional rights, but those rights were being threatened by a takeover from an outside company from the Middle East. And she has fought an incredible battle to prevent that happening. So I'd like to invite her to tell us a bit about the battle that she fought.

Kijoolu Kaliya

My name is Kijoolu Kaliya, a Maasai woman from Loliondo, a community leader. I will just explain in brief the conflict and the battle that we had forged to regain our land rights. I'm so thankful. I want to start by thanking all of you for inviting me here to explain and share with you our struggles in land rights and where have we come from and where we are now.

In Maasai community, land is life. Without land there is no livestock, and without livestock there is no Maasai community. So land is our life in Maasai. As part of our tradition, we usually conserve land, because we don't eat wild animals, we don't destroy land. So as part of our tradition, land has become very rich and profitable, so we have a lot of wild animals, we have a lot of very green forests, but also we have a lot of water resources. It is out of that that the government sees the need to bring in private investors to come invest in our land. Unfortunately, when that investor come, he feel so annoyed with all the bells from our cows, he feel so annoyed with the tsetse fly because of our cows.

Out of that struggle, the government decided to push Maasai community out of the land and our cattle started losing the pasture, so some of the cattle dies. And when our young boys started to fight, then some of them got beaten up or shook down, and most of our houses got burned down.

Because of that, women stood up, and we started organizing a cell to fight this battle. But unfortunately we've been told that we can't organize. The only way we can organize and meet is until we get the permission from the government. And we know that we want to fight the government. It's not possible for the government to give us permission to fight them, so we have to organize in the night. We have to have like separate meetings to organize ourselves.

So we said, in all our meetings we said we don't need to see men, because in our community none of the women are leaders. Men are the village chairmen, councilors, members of parliament, president. So we believe that these men, they have sold our land, and in our struggles we don't want them, because they have been part of the problem. And we said women are prepared, we are prepared to die for our land. And even if we fought and we lost this battle, but we are sure that our children will come and own this land.

So I am a leader in Maasai community and chairman of the women Maasai community, so I was there leading every woman, all the women, to travel from Maasai lands to Dar Es Salaam and Dodoma to fight for

our rights to land. So from our journey to Dar Es Salaam a special commission was sent to our communities. But when that commission came, they never want to listen to us. They just speak, and every time we are trying to speak, they are not listening.

So then we decided that we come to know that potentially the party is about the government, so we said we have to play our last card on the party. So we decided to return all the party. We organized all women to return their party cards to the party that is running the government. And we said when that technique is not paying out, then we are going to destroy the investment from that Arab company.

So when we fought that hard and we get into the position that we return the cards, and then the men were so surprised and said, "Oh, we should join this movement. The women are doing a very great job, and they have gone this far. Then it's time that we support them."

I'll just make this story short, because if we have to narrate all the details, potentially it might take five days for me to narrate all the details, so I'll just end here. But it's important for me to say that we have worked so hard, and at the end of the day the prime minister come to our community and make a declaration that our land will continue to be our land, and it won't be taken away to be given to the investor.

So I come here, and I'm so honored to be here today to speak about this because I know that this, the audience are coming from very different countries. And I ask you also to pressure governments to make that declaration in a formal argument. Because we know without a formal commitment, potentially there might be another struggle. But so far the government has declared that the land will continue to be a Maasai land.

And I'll end here, thank you.

Gordon Conway

It's a fantastic story, and I know that all of us would love to know much more about the detail. Let me just ask you one question. It's a rather personal question. How is it that you were able as a woman in this male-dominated society to get to this state of leadership that made a difference? You were, as I understand it, in a position of leadership within the local community, on the school board and so on. How is it you got to be to that state of strength? What lessons can other women learn from you?

Kijoolu Kaliya

What I did was my journey to leadership started a long way. I first started to build an interest to the school, and that's the area that men are not entrusted with. So I went to school and I make sure like who is going to school, who is not in the school. So from that I get to be in a school committee. After that I get interest in women's rights, so I go to where women organize themselves, so I know every woman and listen to them.

So the women also choose me to be their leader. So from there I start like moving on in the more formal channels.

Gordon Conway

Thank you. Now, let's assume we now have good access to land and good rights towards land. The question is – how does that translate into, then do lead to greater production. How does that then translate into greater production? And, Claude, I wonder whether you could say something, probably on the basis of your experience of working cassava. I know that's a long way away from livestock in Maasai, but the principles may be the same.

Claude Fauquet

Well, thank you, Gordon. Well, before I talk about cassava, let me just say a few words, that I'm very happy to be here. I'm happy to be here for two reasons. The first one is because this week, tomorrow, we will honor our colleagues and scientists that have made major discoveries. And I just completed 25 years of my career translating the discoveries onto cassava. So I'm very happy to tell you that there are transgenic cassava growing in East Africa, and I hope that in three, four years from now, we're going to have the first transgenic farming for their discovery. So I'm very happy about the fact that I am here.

The second reason why I'm happy to be here is because you gave me the opportunity to talk about cassava. So first of all, I'm sure that many of you have no idea about what cassava is. So cassava is the tapioca, if you have ever eaten cassava. Cassava is eaten or consumed or used in the world by about 800 million people. It's grown in 105 countries, all tropical countries. So it's a fourth source of calories for humanity in tropical countries. So it's a very, very important crop. And despite the fact it is very important, it has been very neglected for the last 50 years in terms of research, investment and development.

So I decided, with colleagues from CIAT, ten years ago to create a global partnership for cassava. And I've decided this year to embrace this partnership and try to push it to the point where we can help the crop to be more productive, to be more productive for smallholders, because 90% of the production of the cassava in the world is produced by small farmers. Only a very small percentage is produced by huge haciendas in South America. But even in Asia where you have a very, very high level of productivity, it is produced by small farmers.

So a few words about sustainability of cassava. It is really a food sustainable crop by excellence, by definition, by biology and physiology, for the simple reason that you can leave the food, which is the root part of the crop, underground up to two and a half or three years. So you don't need a freezer, you don't need electricity, you don't need storage, you don't need anything – you just leave the food underground. Now this is really one of the many reasons why many farmers continuing and increasing to use cassava in the world.

The second reason which is more and more important as we are going is coming from the fact that cassava is already gout-resistant. So we have been talking a lot today about changes, climatic changes and so forth, and we all believe that cassava will be the crop of the 21st century for the simple reason that it can sustain high temperature, high CO₂ level and a long period of drought. And for all these reasons, we all think, know and believe that cassava will be very, very more important in the coming decades. It has been important in the past.

I would like to give you a few numbers. Today the world average of productivity in the world is 12 tons per hectare. In Africa it is 10 tons per hectare. But the potential of cassava is really unknown. It is fairly easy to reach 35 tons per acre, and in some cases you can even reach 60, 70, 80 tons per acre. I can tell you this is true, because I have done it when I was in Africa. I grew cassava, and I produced 80 tons per hectare. So this is showing you, telling you that there is potential for intensification of this crop in small farmers' land. The world record is India with 36 tons, and in India cassava is produced by small farmers. So intensification doesn't mean necessarily to have 10,000 hectares and a lot of machinery. There is room to intensify cassava and probably many other crops on small farms. So that's very important.

Now, why do we need a global partnership? We need a global partnership because there is not a voice for this crop. There is not a voice in order to change the current situation, which is very small investment in science and technology. And therefore if we do not invest, we cannot get the return. I told you it's going to be a fantastic crop for the 21st century, but we also know that we are going to get many more diseases. But diseases of cassava are very important already today, but we know that with increasing temperature we are going to get more and more diseases in the world.

So it is clear that, if we want to take advantage of this potential, of this formidable potential, at the same time we have to invest in science and technology, and we have to turn this into product for farmers, and we have to turn this into product for consumers.

Gordon Conway

Thank you. Let me be provocative. Why is cassava superior to sweet potato? It sounds like maybe we should be investing in sweet potato and not cassava – you should change your job.

Claude Fauquet

Well, I cannot really answer this question because I don't know enough about sweet potatoes and usually I don't talk about what I don't know. But I can tell you that the reason why cassava is being neglected is because nobody saw a future in the crop. Nobody saw enough of a future to invest. See, it has been considered like a poor man's crop. And even the presidents in African countries, at least until recently, did not consider cassava as having a real potential for justifying investment. This

translated into the international research system where we have not completely neglected, but compared to cereal, for example, the investment has been very minor.

Now, you're going to see Friday morning the Minister of Agriculture of Nigeria talking about what he is doing in Nigeria, and cassava is a big item in Nigeria. By the way, Nigeria is the first producer of cassava in the world with about 50 million tons of cassava produced per year. So you will see that I'm not the only one having a vision of using cassava for potential development in Africa. You will see this Friday morning as well.

Gordon Conway

You should look forward to hearing the minister of agriculture. He worked with me for seven years, and so I know he's going to say some really good things. So you're producing all this cassava. It needs to be marketed. Beth, this is one of your challenges. How do you take greater production that is coming forward from small farmers in particular? How do you use that in the supply chain? How do you make supply chains work? And in particular of course how do you ensure that women get the benefits from this production. A whole gang of questions.

Beth Keck

I was just thinking, Claude, that we probably need to team up with you on cassava, because if you have the crop of the future, we of course want to be ahead of trend in terms of getting crops to our customers or food to our customers.

Let me just step back and just give a little bit of perspective here on Walmart and how we fit into this. Just getting ready for this this morning, I went on the Web and I looked at the World Wildlife Federation's website, and they do something that I think is really very powerful. They've gone out and they've figured out how much this earth can produce and then how much we are consuming. And today we're consuming about one and a half capability of our earth already, so we're overconsuming. And so as of today right now we are something like 57 days beyond our planet's needs. We're living 57 days beyond our planet's needs as of this day in October, so we've exceeded what we should be doing. And that's really critical, we think, from a Walmart perspective, from everyone's perspective, because we need to get this in balance.

And so that's why we really have gotten behind sustainable agriculture, because we realize that there has to be this balance of social, economic, and environmental aspects as we move toward this greater production that's needed. So we took commitments in 2010 behind this, and they're all on our website; I don't need to go into those right now. But basically, behind those commitments was actually supporting livelihoods of farmers, large and small, working with our supply chain so that there would be more production with fewer inputs and less waste and in terms of our own practices of having sustainable sources to back that up.

We then have layered on with that our own commitments on women's economic empowerment. And so we have a commitment to double the spend of what we are selling in our stores that comes from women-owned businesses, and this includes women in agriculture, as well as training a million women, nearly a million women over the next four years. And so we're putting a lot of focus on this gender mainstreaming, as was discussed in the first panel, as we are working on our other issues in our company.

So I owe you an update. I was here two years ago on this panel, which was pretty much right after we had announced our sustainable agriculture commitments. And I showed a slide of a really dynamic young woman that I had met in Costa Rica. Her name is Jessica Obiere, and she was working in one greenhouse and trying to get that greenhouse operation turned around so that she could be supplying some vegetables to our stores in Costa Rica. And when I visited her that fall in 2011, she had gotten to the point where she was producing about 2,000 units of hydroponic lettuce per week that we were buying.

And I'm just really thrilled. One of my colleagues who's here with me, Chris Cochran, he was on her farm just last month. She now has three greenhouses in operation and is thriving. And that is a concrete example of how we bring to life these commitments for women, women in our supply chain, and also small farmers as well.

Gordon Conway

Thank you. There's a lead-in to the questions I'm going to ask, but before I do that, it always seems to me that in many cases we start with a particular project or a program that gets designed by an African government or a foreign government or whatever. And it's often focused around increasing yield or production of nutrients or increase in income. And then we suddenly think - oh, we've forgotten about women, and we add gender into it - but then usually say, oh, we've forgotten about environment, and we add environment into it. How do you manage to start from the beginning by having these add-ons not as add-ons but built into your programs to start with?

Beth Keck

That really is the transformation that's been happening in our business for the last seven years, and we did begin with the environmental aspect, because you do start somewhere. And it was a little daunting to us to try to take everything at once. But as we have moved through this process, it really is now becoming much more of an integrated conversation inside our company for our sourcing practices - no doubt about that. And it really comes from necessity. For example, you start with where you start, and it's not perfect, but it is a great starting point.

So, for example, when we started out with a smallholder idea, we thought, we're going to find all these smallholders in our produce supply chain. And so then what that did is it made us look at our produce supply

chain, and we discovered that we didn't have a million smallholder farmers there. No way would we meet our public commitment. That then was a very strong forcing mechanism to make us look at other parts of our business.

In this case, we expanded it to our house brands, our private brands, and then we sat down and we said – okay, where are the smallholders in that supply chain? And that has really broadened our levels of activity, because we discovered that it was in cotton – cotton in China, India and Pakistan, to be specific – because we sell a lot of sheets and pillowcases and clothes.

And then we also realized that there were other crops that were important to us as well, like actually apples may be a surprise to you. But 40% of the world's production of apples happens in China, and a lot of those apples turn into apple juice that we sell at Sam's Club and Walmart. So we have this interdependency on these smallholders in China for apple juice that we sell here in the United States.

And so just mapping and starting to look then starts guiding actions.

Gordon Conway

Everywhere you go in Africa you can see innovation – on the farm, in the district, in the county – hundreds of examples of innovation. And the question that we all face is – how do you actually take those innovations to scale? I'm going to ask each of them to say that before we've finished to say what they've got to say about it going to scale. Tim, you might want to talk about China here but maybe not.

Tim Hansted

I'd be happy to.

Gordon Conway

Okay, talk about China, because that's a near success story.

Tim Hansted

Yeah, it is. I mean, it's interesting we're talking about addressing food security and addressing poverty alleviation, whatever it may be. We certainly can't ignore China. I mean, the most successful achievement in human history, whether it's by food security or addressing poverty has happened in our lifetimes in China over the last 35 years.

And it started, really built on a foundation of tenure reform. I mean, it was changing a collective farm system into a family farm system that was done for almost 200 million households in the course of three years in the early eighties that started things going and led to huge increases in agricultural production and subsequently China's economic miracle kind of built on that. But it started in rural areas, and it started with land changes, land tenure changes.

Now, China is not all the way there yet. I mean, Chinese farmers now for the most part have 30-year use rights to land. Of the 200 million

households, about half of them have those legally documented, so they're about halfway in that process. Those rights aren't always strong enough to protect them from local government appropriation. So they still have a ways to go.

But those changes which happened at scale. And the thing about land rights changes is they, at least the way Landesa approached them, I think it's the government has to make these changes. And typically they start with legal and policy changes and then of course they have to be implemented. So you have to almost think about scale from the very beginning.

But there in China we see the differences between farmers who have those legally documented, secure rights and those who don't, in terms of investments they make in their land is astonishing. So it's not just that it creates the incentive and the ability to make the long-term investments that are needed.

And by the way, as the consumption patterns change from grain-based to fruits and vegetables and animal base, you typically need long-term investments on the farm in order to adjust to that, and we've seen that remarkably in China.

Gordon Conway Part of the success comes from leadership at the top in this case.

Tim Hansted Yeah, it certainly required some initial legal and policy reform and leadership at the top. Actually the story in China was it's a little more bottom up than what I think the Chinese history tells. But the leadership at least allowed for innovation to happen. And once they allowed for that innovation to happen, it spread wildly, and the leadership at least blessed it.

Gordon Conway Madam Kijoolu, yours is an example of very much from bottom up if you like, of change. To what extent are the Maasai communities following your leadership? To what extent have you got an impact on other Maasai or even other non-Maasai rural communities from your activities? How are you influencing them?

Kijoolu Kaliya My leadership has not just been limited to the struggles of the land, but also I really take the opportunity to organize and be an inspiration to the other Maasai women. And, for example, we have established different Maasai groups. We have livestock-keeping groups, cooperatives. We have now established credit and savings. So, for example, what we want now is to build concrete houses like this for women, because traditionally Maasai have a very temporary kind of housing. So we are moving forward and inspiring other groups, other Maasai communities, other groups outside Maasai.

- Gordon Conway** Thank you. You have another comment, madam.
- Kijoolu Kaliya** So in our livestock-keeping group we wanted really women to have a lot of cows and a lot of cattles, and we want them to keep them close to the investors so that if these investors get annoyed he has to leave, and the Maasai women take over.
- Gordon Conway** Thank you. We need to go. Claude, when you think about what you're doing with cassava, how are you building in from the beginning of this the notion of going to scale, so that when you've got marvelous new cassava varieties, marvelous new processing techniques and everything on the farm, how do you get that to happen at the community level or national level.
- Claude Fauquet** Thank you, but before I answer your question, I would like to link the previous two questions with cassava. I mean, the importance of the human factor, first of all, for any crop probably but cassava in particular. One of the failures of breeding in Africa is or was coming from the fact that we have ignored too much the human factor. And one human factor, you're talking about women, because farmers will decide if you're going to grow this variety or this variety. Before they decide, they're going to give the roots to their women, and the women will process the food, and they will tell you, "Don't bring me this anymore, because it is just water - I don't want it." So there is a very important factor at the family level, but women are very important in the decision-making process for the farmers who choose if they're going to grow this or that.
- Now, in the terms of science, we ignore or bypass this too much because probably we felt it was too complicated. I don't want to give you a course of cassava genetics, but it's a very complicated crop in terms of crosses and etc. So it was ignored, and therefore we missed opportunities.
- So what we are doing now, we are taking this in consideration again. We are going back to farmers to inquire about what the needs are really to introduce this into the breeding system.
- Now, the second question about innovation is really illustrated also for cassava by the fact that, for example, now with genomics of cassava and what we call genome-wide selection that we can apply, now for genome-wide selection, this could not be done without genomics. And because we invested into genomics of cassava, now we can use this technology, and this technology can take into account not only virus resistance or yield or different components, but we also can take into account the processing qualities, the cooking qualities, the sort of things that we could not even consider in the past.

So this is really showing the link between the human factors, the human determination about what's needed, what's required to improve, and science and technology that can help shortcut the system.

Now, to come back to your last question – what are we going to do if we are in a position where we have 30 tons of cassava per hectare in Africa everywhere. Well, first of all, we are not yet there, so it is going to take some time. We have time to think about it. But to be serious, what we propose right now, the philosophy of GCP21 is to look at exactly this question. At the same time that you invest in science and technology, and you have to do your best possible investment, at the same time you also need to look at what do you do with this increased productivity?

And as a matter of fact, in two weeks from now we'll be in Nigeria to talk with the ministry of agriculture and scientists and developers and feed makers, etc., to figure out – what can we do? The minister is putting in place a huge program that will produce even more cassava and more ways of cassava – how can we use this to turn this into something useful? So the answer is – making feed for animals.

Now, deciding to make feed for animal, it's not a decision of scientists or developers, even a minister. It's a decision of the community involved from using this material to the development and the system, and this will involve the private sector, the producers, the consumers, and the scientists. So we promote, as this partnership, we promote this type of discussion at the same time that we promote investment of hard-core science.

Gordon Conway

It seems to me that one of the problems of getting farmers in value chains is that progressively the value goes up the chain to the supermarket or whatever, rather than increasing at the bottom of the chain. How do you deal with that?

Beth Keck

The way we look at this is we really look at efficiency and how you can make a value chain more efficient. So if we take Jessica, our farmer in Central America, she's benefiting from a business model that we invested in where we are basically buying directly from her and giving her direct market signals and having a long-term relationship with her so that she knows she can invest in that next greenhouse and the next greenhouse. And so it's very much having these long-term relationships that are key.

Gordon Conway

Thank you. We've come to the end of our time. Claude's comment reminded me of the great Borlaug story when Norm took all these seeds from Mexico up through to Los Angeles and then across to India. The first harvest was so great they closed the schools and stored all the grain in the schools. And that's what one means by an agricultural Green Revolution.

I'm just going to say three things from the finishing. First of all, those of you who are interested in talking more about sustainable intensification, we have a side event at 7:30 tonight in the Cedar Rapids Room just along the way. This is a very diverse group, but in a sense we've encapsulated in this diversity some of the key issues that we need to go forward. We need to get land rights right. We need for poor farmers throughout the world to have proper access to land. When they have the access to land, then with science and technology they can produce far more food, far more agricultural products. And then there's the potential for companies like Walmart and elsewhere to come in, and other companies, to come in and provide sustainable, fair markets for what they're producing.

So even though we're a very dispersed group, a disparate group, we've brought all these elements together as a basis for going forward. I'd like to thank the panel enormously. And of course what you realize about them is that they're disparate, but in one sense they're all united, and that is a huge passion for what they do. Thank you all very much.