

CONVERSATION: IMPROVING EFFICIENCIES IN THE ENTIRE VALUE CHAIN
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Sir Gordon Conway, Professor of International Development, Imperial College London

Thank you, Bian. Good morning, everyone. I'm delighted to see you all here. It's a different audience from yesterday when I spoke at the Central Academy High Schools. They were very lively and very bright, so I hope you're going to live up to my expectation. Otherwise, I'll just get all those Central Academy people back here.

The whole concept of a value chain is in many ways a useful tool for analysis of agricultural production, but of course it's also a tool for in practice for making things work. So it's got those two components to it - the capacity to analyze and understand and the capacity to do things.

I'm just going to show a couple of slides, because we're talking effectively about the efficiency the value chain. And I like to talk about a long value chain, which goes from the molecules in the plant there to the molecules in the human being over there. And there are stages in all that process from the molecule to the molecule. But in fact of course we're going to talk mostly about that middle part there, which is the farm gate to the fork. That's what we're going to focus on now.

But just remember - people are making money and adding value right down to the molecular in the plant and at the molecular level in the human being.

When we talk about efficiency, we're talking about increasing value added from stage to stage, reducing waste, reduced transaction cost, and (I haven't got it in this slide; it must be a later one), reducing risk. So waste, transaction costs and risk all affect the value as it goes from stage to stage.

And then of course part of the efficiency is the speed with which you go from one stage to the next. That's not necessarily a good thing, but it's in there. And there is a big controversy, of course, about how long should a value chain be. You know, it's like a piece of string - how long should a piece of string be?

And of course we're not just talking about efficiency. We're talking about equity - who gets the value added - and we're talking about the impact on the environment. Does the efficiency increase the pollution that's caused, or does the efficiency, for example, increase the emission of greenhouse gases? And we're going to get examples of all of those issues when we talk this morning.

Okay. We've got five excellent people on the stage, people with real experience of either analyzing value chains or putting them into practice. I've got on my left here Perry Yeatman and then Beth Keck and then Silas Baru next to her (her translator is next to Silas), and then Carl Ganter next, and then finally at the very far end over there is Shenggen Fan. And I'm going to introduce each of them just before they speak. They're each going to speak for five, six, seven minutes, something of that order, and then we're going to engage in a dialogue about many of these issues.

So first of all I want to introduce Perry Yeatman, who is the senior vice president at Kraft Foods and perhaps more importantly the president of Kraft Foods Foundation. She had a history in the corporate affairs for Unilever and then moved over via a communications firm where she worked, Burson-Marsteller; then she worked on to become up to president of the Kraft Foods Foundation. Perry, would you like to start with some good stories, I think is what we're going to do.

Perry Yeatman- Senior Vice President, Kraft Foods Inc. and President of Kraft Foods Foundation

Thank you. So let me start with a little bit of a background, which won't be new to everybody here, because it is the basis of the New Vision for Agriculture work that we're doing with the World Economic Forum.

And that is the belief that agriculture done right is the single best answer we have to simultaneously tackle three of the most pressing problems that certainly Kraft Foods is interested in and I think we're all interested in, namely, food security, environmental degradation and poverty. So agriculture is critical; it's the best answer that we've got.

The approach that we're taking is holistic, it is market-based, it is multiparty. And when I say "multiparty," that is everywhere from government through civil society, meaning everybody in the supply chain, in the value chain, lined up, including for us, very importantly, our suppliers and our partners. And as we reaffirmed yesterday morning, it is farmer-focused. If it is not farmer-focused, then we're not going to get anywhere. So again, that is market-based, multiparty, holistic, farmer-focused. So that's the approach we're taking.

And in taking this kind of approach, what we believe is that we can develop solutions that are sustainable, scalable, and replicable - which is really what we're all trying to do. When you think about the size of the problem, you have to focus to make a difference, but then the idea is to create something that is indeed sustainable, scalable and replicable.

So a couple of the places that we as Kraft Foods are playing: we don't own farms. We don't own land in that regard, but we are one of the largest users of agricultural products in the world. So, for example, we are always near the top if not the top of the buyers for branded cocoa. Okay, I know a lot of people think of Kraft as cheese - we love cheese, we're big on cheese, but we actually are the largest producer of chocolate in the world.

And if you look at why we care, okay, in order to sell a chocolate bar you need cocoa. If you look at the largest-producing markets for cocoa, cocoa is mostly grown (you all know this) around the equator. Many of these countries are developing markets. And cocoa particularly is

something that is really a smallholder cash crop. So one hectare or five hectares – it is not a big, commercialized crop at the farm level.

Let me tell you a little story about Ghana. We buy a lot of cocoa from Ghana – it's a very important market for us. And the average age of a cocoa farmer right now is about 57. And one of the most important messages that they are taking to their children is – “Don't be a cocoa farmer.” So it's the second-largest cocoa market in the world, and if the average age of cocoa farmers is 57 and they're encouraging their kids not to be cocoa farmers because they could have better lives doing something else, you can very quickly see the problem if you're the largest buyer of branded cocoa in the world.

We have several programs in cocoa around the world, but I'll just give you two examples that actually both happened in Ghana.

One is a program we are doing called the Cocoa Partnership. It is exactly what I said before. It is a holistic endeavor with the government and civil society and Kraft Foods working together to, what I say, complete the cycle; create the virtuous cycle. And the virtuous cycle is starting with the current farmers, so it is about getting yields and income up for the farmers of today.

But if you think about this as a generational question, that alone is not going to solve the problem of how do you interest the next generation in becoming cocoa farmers. And so the rest of the circle, the next bucket, is actually working with the kids and also the women to say, okay, cocoa can be a business. Help these farmers become business people; help them understand how to run their farm differently.

The next piece is about microenterprise and alternate sources of income, so not just cocoa farming. It could be other types of farming; it could be other types of microenterprises. And so that is to create greater incomes and greater diversity of available products in a village.

And the last bucket is – even if you've done those two things – you've provided better training and education and you've made it a business, you've gotten the yields up so the incomes are up, and you've created better economic opportunity in the village, it still doesn't work if you basically don't have electric and sanitation and education and basic healthcare. And so we are partnering also to try to find ways to deliver that.

So once you get all those things in place, we believe that we can create a virtuous cycle and actually have people in Ghana want to choose to be cocoa farmers and see that as a livelihood that would be a good choice.

So we're doing that right now. By the end of this year we'll be about 200 villages in both the east and in the west.

Another example and another cocoa program doing in Ghana and Kraft, etc., is actually the Cocoa Livelihoods Program, which we're doing with the World Cocoa Foundation and the Gates Foundation and about 17 other companies, I believe. And that's a similar-type holistic program, and it has seen tremendous results. So far since 2009 we've reached tens of thousands of farmers, and we have seen there a near doubling of yields and significantly improved

incomes. So that's something measurable, tangible – and that is the first step, is actually to help the current farmers.

Another very different model that we were talking about right before the panel is on cashews. So what I'm trying to do is give you examples of how the private sector can play. Sometimes we are a catalyst for a holistic program of which we play a very small role but an important role, a convening role perhaps. And sometimes in the example of a Gates Foundation cashew partnership that we have in West Africa, we actually are what we would call the market-maker.

We are the purchaser of that product. In many of the cocoa examples, that cocoa then goes into the market. We believe that in a pre-competitive way, by producing higher quality and more cocoa, that helps all of us. And if you're one of the largest buyers, you can understand why it would differentially help Kraft.

But in the cashew example, we are actually the buyer. And the example there was most of the cashews were raised and grown in West Africa, but they were processed in India. And so not only did that take an environmental toll, it also of course took time and money, and it meant that most of the value add was not happening in the place where the crop was grown.

So several companies and groups got together and we decided that actually if we could increase processing in West Africa, we would be able to move it closer to where the crop is actually grown and we would also be able to create more value add staying in West Africa. And that indeed has happened.

So those are just two examples I wanted to share.

Last thing is what do we want to see? What would our request be in terms of what could happen better?

The first one is – line up the entire value chain. As I said at the beginning, it is really important. We need a neighboring environment that lets these initiatives flourish and indeed become sustainable, scalable and replicable. So we need to get everybody on board, rowing in the same direction.

Second one is data and measure. I know it's not sexy, okay. We heard yesterday, agriculture is sexy – I agree. Ag is sexy. Measurement data not so much, in my mind; but it's really, really important. Right now we do not have enough. In corporate America we say – What gets measured gets done. We don't have enough data to prove success and to figure out what's working and what's not working so that we can build on those things more quickly and we can stop doing the things that aren't working.

And the last request, and it was mentioned before I started, is waste. It is low-hanging fruit. Everybody's now talking about it. I'm delighted we're talking about it. What I want to see is [that we] doing something about it – waste again through the entire value chain. We don't have to produce much more if we actually just significantly reduce the waste that we have today.

Thank you.

Gordon Conway

Well, I think that was an excellent introduction, and Perry has raised a whole lot of issues that others will touch on but we'll talk about more in the discussion.

I particularly like this criterion of sustainability, replicability and scalability - and I think that will run through all the presentations.

I'm going to put my smiley spectacles on, because otherwise I can't read, and now introduce Beth Keck who is the senior vice president for sustainability at Wal-Mart. She's joined Wal-Mart in 2004 as Director of International Corporate Affairs. Interestingly, she served for a number of years in China as the U.S. Federal Aviation Administration's Senior Representative, and also for the Boeing Company in Asia Pacific, Vice President for Air Traffic Management Business Develop.

She has a long history of work in the corporate sector, and we're delighted to have her here on the stage, and I'm going to now give you the pointer.

Beth Keck- Senior Vice President for Sustainability, Wal-Mart

Thank you, Gordon, for the introduction. And it's really a wonderful opportunity to be here today and also really part of this 25th year celebration for the World Food Prize.

What I'd like to do is just give you a brief framework about Wal-Mart and how we really play in terms of efficiency in our value chain and a couple of examples on that. So if you could bring up the slide.

Basically, we operate 9,700 retail units in 28 countries. And many of the countries that we operate in are in the emerging markets or middle-income countries. So we're very, very focused on what is happening in the area of poverty alleviation, as well as having to look at, you know, we're involved in very advanced economies as well. So we're really covering the full spectrum.

What's important to us in this forum is that a lot of our revenue comes from our grocery business. We are a huge grocer. And so the issues that Perry talked about, that the World Economic Forum has rallied behind, are very, very relevant to our business as well.

So what we did is we stepped back and we said - how can we as a retailer and grocer really play in this area of sustainable agriculture? And I would say, Sir Gordon, we're probably grateful to you and all of the work that you did in terms of helping to define this space. And we tried to figure out what that intersection should look like for the company.

We've come up with three focus areas, which you can see on the slide, and it's basically the focus or activities around supporting farmers and their communities, producing, working with the growers that we buy from so that they can produce more food with fewer resources and less waste, and then to sustainability source key agricultural products. And particularly we're focusing on agricultural products that affect deforestation, such as palm oil and beef source from the Brazilian Amazon.

What I'd like to do is just give you a couple examples of how we're operating in two very different scales of agriculture.

Yesterday it was interesting. I was sitting in on the panel on young people and farmers, and the president of EARTH University was talking about how he and other educational institutions are preparing young people to become farmers. Well, this is one of our farmers right here, and so we're the beneficiaries of this investment.

This is Jessica. She is a farmer in Costa Rica, and she approached our Wal-Mart Central America business about a year ago, very interested in seeing how she and our family could start supplying us. Her father had passed away, and they were looking for a way to support the family. And she has a Master's Degree actually in national resource management.

She's become a lettuce grower. She started out by providing us with 500 units a week, and in less than a year - we're not even at a year at the moment that we started sourcing from here - she's now up to 2,000 units of lettuce a week. And she's now moving into other produce commodities.

And so she's a great example of how we are really working to link small farmers, smallholders to our retail operations to serve our customers. And for us we're doing it because it's really good business. We're able to have a direct relationship with the farmers; we know where the food is coming from. This improves food safety, which our customers are very interested in.

We shorten the supply chain and it improves the nutrition of the food, the fresh food that we're selling, and it improves income for farmers. And frankly we get a better margin out of it too, so it's a shared benefit from a business perspective.

The other example is the other extreme. Here in the United States, the Pacific Northwest, we have great apple-growing country. And all of us love apples, and I know when we go to the store we're looking for this beautiful, perfect apple here.

But the result of that search for perfection in the store means that there's often waste on the ground. And typical in the Pacific Northwest seven percent of the apples were never picked. They would have just thrown on the ground if they were imperfect and totally lost.

And so it's interesting - another theme here at the World Food Prize is technology. And it's interesting because new equipment for field sorting that can also use the same amount of labor as now letting the growers that we're buying from be able to pick the whole crop.

And it's interesting. This has come at a very important time in terms of prices for apple juice. We're getting a lot of apple concentrate that was being sold through our stores imported. There was a 50 percent price increase on some of that product. And now, by capturing apples that were totally lost and getting them into the food chain, we've actually been able to fight inflation and keep a better price point for our customers on apple juice.

So these are just two examples of how we're looking at efficiency in our business and focused on that in a sustainable manner.

Gordon Conway

Thank you, thank you, Beth. You can see how a number of these things are coming through. And of course what we know about agricultural development is it has to have a top-down and a bottom-up, as it were. It has to have corporations, like Kraft Foods and Wal-Mart, engaged.

But the key, of course, to sustainable agricultural production is the smallholder, of which we've got, what, 400 million in the world? And we're very fortunate today to have one of them with us, Madam Silas Buru, from Ethiopia. She is a small farmer in the Tigray region of Ethiopia. She has about a quarter of a hectare of irrigated land. It doesn't seem like a lot, but with a quarter of a hectare and skill you can do a great deal.

She has been very active in local community affairs. She's been part of the design team for the index insurance product that's being produced for farmers in her region by Oxfam. And she's here sponsored by Oxfam to share her experiences, her life as a small farmer in Ethiopia.

She speaks a language of her region, Tigrinya, and so she will be translated. But we are delighted to have you with us, Madam Silas. Please talk to us.

Silas Samson Buru-Ethiopian Farmer, Oxfam Horn of Africa Risk Transfer Adaptation Program

First of all, I'm glad to thank Oxfam America for the opportunity they gave me to attend this historical event.

My name is Silas Samson Buru. I am 55 years old. I came from Ethiopia to Tigray Region and to our village.

I have one hectare of rainfed land and a quarter hectare of irrigated land. I am the head of women's association in my village.

We have three planting seasons. From May to June we plant long-cycle crops such as maize, sorghum and finger millet. From June to July we plant short-cycle crops such as barley and beans. I also plant during the dry season from September to May.

Before, our village has better weather conditions. Our village was covered by forests, we had plenty of livestock, and we had a lot of production. Our rainfall was even distribution.

But after 1984 we have been affected by serious droughts. Some of the people migrated to neighboring countries to die. Seeing as we have rivers, Oxfam America, in collaboration with local NGOs, started to construct a river diversion. Hundreds of farmers had been using the traditional irrigation. Then after construction, more than 400 households have been using to cultivate fruits and vegetables.

The construction was planned to be completed within five years, but it was completed within three years. The people of Adar are showing a lot of improvement. I am one of the beneficiaries. I had 100 trees of mango. I also plant potato, pepper and tomato.

My home was made of grass, but after the project, I converted into corrugated steel.

I also sent my children to school. I have one graduated from university and working at textile factory.

We have been seriously affected by drought. Oxfam also piloted a weather index insurance project in our village. They conducted a discussion with the community, and they asked us to tell them the major problem. And we told them that drought is our major problem. Our main problem is really drought.

Then they proposed a risk transfer and risk management tool called insurance. Thus, we can buy index insurance and there is also a possibility of getting a letter. A design team was established by the community. There are five members. I am mobilizing the community to join the project.

A lot of people have joined the project both in letter and in cash. This project has a lot of advantage. Number one, it develops the confidence of the farmers to use technologies such as fertilizer and improved varieties as well as to take loans.

So since the insurance program also we have been constructing soil and water conservation activities have been replenished. All the insurance farmers made compost to improve their soil fertility. Agroforestry has also been done.

We would like to continue this project if we are being supported by some friend. I hope in the future all the farmers will buy index insurance in cash and agricultural insurance products will be promoted.

I also had one son who completed grade ten and farming and modern irrigation in our village. We were not educated, but the next generation has a good chance. They are well educated, so I hope the future, the next generation will be more benefited and change our world better, so we will not need much food aid in the future.

Thank you for your kind attention.

Gordon Conway

Thank you very much, Silas. That was a fascinating account. And there's so many things that we could talk about that came out of her account. I hope we're going to talk a little bit more about the issue of risk and weather insurance when we get into the dialogue. But thank you for coming to visit with us.

And then the next speaker is Carl Ganter, who is the Co-founder and Director of Circle of Blue. He's an award-winning photojournalist, writer and broadcast reporter. He's appeared on many television shows and written newspapers and magazines. He's been a key figure in the World Economic Forum's activities, and as a matter of fact has just flown here from Abu Dhabi last night.

He is co-founder of Media Via LLC, a media production firm and of course also the co-founder of Circle of Blue. Carl.

J. Carl Ganter- Co-founder and Director, Circle of Blue

Thank you very much. It's a great pleasure to be here. I'm the journalist and the water guy on the panel. This morning on my way here (we can put up my slides here)... Was it this morning or last night? I'm not sure. I flew over the Tigris River, and talk about history and talk about connectivity and talk about our ancient paths - we could actually see the paths that the shepherds had used over the years, over eons, really, to bring their crops and their livestock to market and to water them.

So I imagine these rhythms, perhaps because I was at 30,000 feet and very tired, but I could picture myself, I could picture this whole thread of human history.

But today we face new risks. When we talk about risks; we talk about insurance; we talk about how companies are evaluating supply chains.

We live on this little oasis in space, and we have a perfect storm that's unfolding here. We have a perfect storm of water, food and energy and this connectivity.

So when we talk about value chain, we talk about efficiencies, I want to talk about three stories. I want to take you to three different places very quickly around the world as part of our coverage.

So we're going to start with Mexico's Taw Khan Valley. This is the place where corn was first domesticated. It's also a place where the new normal is - we're finding watering holes like this drying up because of climate change and rainfall pattern shifts.

We're also finding farmers who for the first time in their known history actually have to buy water. Talk about supply chain efficiencies - what are they going to do in order to maintain their crops? Can you afford to actually buy water to irrigate corn in Mexico and rural Mexico? So this is the new normal in Mexico, certain parts of Mexico.

But then we also have this tug and pull, this struggle. We have factory farms that are literally pulling water out of their own aquifers. The farmers you saw are up-valley here, so the aquifer is going down. We have issues of imbedded water in the pigs and chickens that are being shipped around the world.

And so when we're talking about efficiencies in supply chains, we also need to be talking about value. How do we value water, food and energy? How do we look at these three things together? And again that interplay - it's something that's a priority at the World Economic Forum, particularly this water-food-energy nexus.

So their wells are running dry, the rainfall is less, and let me have people like Francisco Rosa Valencia, who's a local hero. She's leading the charge to plant more drought-resistant crops and actually looking back through history to see what worked - amaranth.

She's planting because she's crying as she's telling us the story. I was in the room. It was very emotional. The story of her family, her children were leaving because their wells were dry, her corn was withered; there was no future. They were leaving to go to Mexico City and northward to the U.S.

She's holding a picture of her son who she hadn't heard from in more than a year. She didn't know if he made it across the desert.

So again we're talking about efficiencies, we're talking about supply chains, we're talking about real people - real people and from small villages to the big cities and urban centers.

In Australia, talk about a new normal. The Murray-Darling Basin - a 12-13 year drought, which was broken last year by rain. But talk about a new normal as far as aquifers, as far as watershed management, as far as allocation and what's grown.

We talk about values and supply chains and risk - it's all about choosing our efficiencies and choosing what crops should be grown where. When we talk about water footprinting, it's also contextual - water footprinting: how much water does it take to, say, grow the apple that you've held up. If you grow it in a dry versus a wetter area, there's a difference there in the calculation.

So Australia's Murray-Darling Basin, I was flying - and I'm a photographer, we had our teams on the ground - flying a lot, and here is this blue oasis. So I said, "Take me there." And I hit the button the GPS, I shot the pictures, and they went down and found the farmer.

And the first thing he did is he complained about how deep he had to drill his wells each year, how much deeper he had to drill to grow rice in very dry, basically, growing rice in the desert.

So again talking about new normal, talking about efficiencies in supply chains, what are these choices we're making? Where are we going to grow our crops?

But also is a hugely bad news story. It was amazing from a journalist's perspective. I spoke to another local journalist, a radio reporter, who actually cried on the phone when I spoke with her, because she said, she explained, "This story has been going on for 12 years in the Murray-Darling Basin." She was afraid to go back on the air and tell it even more.

How do you cover a story, a long-term story, for 12 years? But she was afraid that if she did one more story about this drought, that another farmer would take his own life. The suicide rate was that high. She was just terrified. So talk about a new normal and talk about these great challenges.

So then there's China. So China, of course, should be big, if it's not big on all of our radars already, but particularly in this food-water-energy nexus. This is Wu Yong. She is the daughter of an inner Mongolian shepherd family.

In the background are two of the world's largest coal mines. Also in the background is a little tractor with a little tank; you can see that there. That's where they have to drive 15 kilometers now to get their water for their livestock because the coal mines have drained the water.

We talk about a water-food-energy nexus and we talk about efficiencies in supposedly chains. These supply chains are very complicated. Will energy get more water than agriculture? Who wins in this struggle? So China faces this every day. We see a major, major struggle between water, food and energy because you have farmers like this whose water supplies are being entirely sucked dry by the energy sector.

Talk about supply chains – how do you supply the water? This is the South-North Water Transfer Project, which is designed to bring water from the south of China to the north of China. It's perhaps the largest infrastructure project ever imagined on the planet, over \$66 billion project. And there's question whether they'll be able to fill it with water – again engineering choices: this is water for agriculture, water for cities, and water for energy, and water for coal.

So when we also talk about this, we talk about the Yellow River. Okay, so what are some of the solutions? What are some of the things we're finding that show a little bit of hope? Well, the Yellow River is actually flowing to the sea again, because they're actually allocating water for the environment.

And there's an innovative program, which I would encourage you all to look at, and that's the program of water rights trading. It's a pilot program – water rights trading between industry and agriculture. So now industry needs to be much, much more efficient in order to supply the water for agriculture.

China wants to increase its grain production by 10 percent by 2020 – how are they going to do that? They will do that through better efficiencies in irrigation, better efficiencies in water delivery, and also where they're choosing to grow their crops and which crops they're growing.

So really you also have to look at the efficiencies in this tug of war – it doesn't have to be a tug of war – or this relationship, this sharing of water between urban centers and the agricultural sector.

So in Beijing, this is a water treatment plant – Beijing has mandated that 98 percent of its water will be recycled. Whether they get to that point or not, we'll see. But that means more water for agriculture. And there's also the concept, of course, of cities investing – in order to get more water for cities – investing in improved agriculture, improved irrigation practices, these efficiencies in the field. Because when we talk about risk levels, we are talking about risk. We have one chance to get it right. We are talking about tight windows of risk here – not much give and play in the system.

So when we talk about also China looking at things – this is a tomato hothouse in the middle of December when it's 25 below zero outside – when we look at how China is positioning itself, we also need to look at how water trading is taking place globally across borders.

So China to insulate itself in the water footprinting is investing in coal and other energy sources in Australia, in the U.S., in Canada, investing in food supplies, in growing food in South America and Africa. This doesn't make sense on the books today, but it makes sense from a water and water-embedded perspective. Remember the pigs and chickens in Mexico.

So big questions – where will they get the water? How will we respond? A few points here.

Responding requires systemic thinking between food, water and energy. Every decision we make really needs to take this into account. It's a complicated calculation, but we really need to value these different pieces and see how they interplay.

And, yes, there is hope in new technology and improved irrigation, and improved crop placements, and also in what Norman Borlaug did so well, and that is developing the right crops to grow in the right places and the more efficient crops.

But then also looking at new practices and even ancient practices. So I just wanted to tell you a few stories to put this in context to take you a few places, because we have a lot of great things to talk about on the efficiency side here.

Thank you.

Gordon Conway

Thank you very much, Carl. What Carl has done is brought to the fore something that's in the background of what the other speakers have mentioned, and that is what he calls the new normal – climate change. The Murray River Basin is interesting because it was the shortfall in Australia's grain production which really triggered the 2007-2008 food price spike. It's very difficult to say that that drought was a consequence of climate change, because droughts occur in that region of Australia.

But we do know that the reduction in yields in the Murray River Basin was a result of higher surface level temperatures. And so there is at least some scientific evidence that climate change did have a role to play in that reduction in production. Elsewhere it's still one of those situations where you can't actually pinpoint a particular bit of anthropogenic climate change and link that to agriculture.

I'm now going to finally ask Shenggen Fan to talk to us. He is the Director General since 2009 of the International Food Policy Research Institute. He was educated originally in China at Nanjing Agriculture University and then did economics at the University of Minnesota. Worked for ISNAR, the International Service for National Agriculture Research, and then went to IFPRI and has been a major force in the growth of IFPRI as a leading center for agriculture, economics and policymaking. His recent papers on climate change are really very good. Shenggen Fan.

Shenggen Fan- Director General, International Food Policy Research Center

Thank you, Gordon. You forgot one item in my CV, my bio. Actually, I was a small farmer in China. My family owned a .5 hectare of irrigated land for rice, cotton and wheat production.

Well, it's very difficult to be a last speaker to say something different. So I just wanted to make five brief points.

The first is – how do we scale up the success of the private sector? Even our Ethiopian farmer mentioned it.

We know that only 50 percent of smallholder farmers sell their products, so they are not sellers. And even within that 50 percent who do sell, they usually sell at the local market and not beyond their village; not beyond their small towns. So a majority of smallholders do not have access to the long-term chains Gordon mentioned.

And it's very ironic that most of the consumption of the staple foods in large cities in Africa actually are now importing the food, so you see this link between smallholders and the urban markets, high-value markets in particular.

And the smallholders, if they do have access to value chains, their share in the total value chain is very small. IFPRI in Indonesia shows that, in a traditional value chain, farmers usually can have 35 percent share in a traditional value chain. But in modern chains, that share declines to 26 percent.

So how can we make sure that, first, we can scale up smallholders' access to this long-term chain? The second – how do we make sure the farmers benefit from that engagement?

Then my third point I wanted to mention is we do need to integrate nutrition and health into the whole chain. Gordon, you mentioned that in your introduction, we should not just look at money – the value chain sometimes means the money chain. We have to go beyond money. Nutrition, health, water... all this has to be part of the equation. So when we measure the efficiency, all these have to be the indicators.

So right now we have 500 million smallholders who have less than two hectares, about 2 billion people that are involved in the smallholder production, the family members. And more than 1 billion people were hungry, undernourished; 2 billion people are deficient in micronutrients in vitamin A, zinc and iron.

The majority of the people who suffer from a deficiency of micronutrients are smallholders. So we've got to integrate nutrition and health into the whole chain, not only in the production but also in pre-production like seed selection when we select the seed, so the seed contains high-intensity of the micronutrients. Or we can even use modern biotechnology to add micronutrients into the crops. This is particularly important for rural girls in South Asia. Add iron into rice to improve the anemia situation dramatically.

My fourth point is, yes, we do need to take into consideration carbon emission, water, and water use and water footprints. The smallholder plays a larger role there. The smallholder sometimes is part of, I have to say, the smallholder sometimes is part of the problem, but it is also part of the solution. So how can we provide smallholders with incentive to cut down the carbon emission, to cut down water use, and to use them more efficiently?

Now, my fifth point is about the gender issue. We have to pay attention to gender issue. The recent AFO study, together with IFPRI, shows that if we narrow the gap of access to assets between women and men, we will bring more than a hundred million people out of poverty and hunger – simply by addressing the gender gap.

So the women farmers, yes, have lower productivity; we have to acknowledge that. That's because they have lower access to assets, to technology, to extension services.

Now, my last point is about land. During the last three or four years, because of food price hikes, land prices have increased by a hundred times, two hundred times, even three hundred times. So this is not only true in North America, in Canada, in some of the emerging countries, it is also true in Africa. So land has become very scarce. Land degradation will add more to that scarcity.

And somebody has mentioned land grabbing. I don't know who mentioned land grabbing. Yes, indeed, many masters see that as an opportunity.

We do see a win-win opportunity for investors to go to Africa and South Asia to bring technologies, investment, and markets into the region. But in the meantime we have to make sure that smallholders will not suffer from that engagement and that there are win-win opportunities. So we need to make sure that we develop some good practices to implement a good code of conduct to make sure that everybody would benefit from that, particularly smallholders.

I thank you very much.

Gordon Conway

Well, Shenggen says it's difficult to be last speaker, but of course he's brilliantly laid out the key elements of much that we're talking about.

The common thread through all of this is that we have to take a holistic approach. And I suppose if I asked you to raise your hand; I'm not going to do it, but if you were asked to raise your hand, "Do we need a holistic approach," you'd all put your hand up and say yes.

What I want to do, though, is ask a question about that which is much more difficult, I think, to answer. So I'm going to ask the two representatives from the corporate sector. And that is – how do you start? If you want to end up with a holistic, all bells and whistles value chain, which is sustainable and efficient, has got access, reduces waste, reduces risk, and so on (which is what we all want), how on earth do you start?

Can you remember how you started on cashew or cocoa or how you started in Latin America or how you started with the apples? Well, with the apples, you already had a bit of a value chain anyway to start with.

But just tell me – how do you get started? Maybe there are people out there who want to start producing a holistic value chain.

Perry Yeatman

It's a great question. I mean, I think one of the key issues is actually understanding the problem and recognizing, you know, historically that a lot of big companies buy from other big companies. So we were further away from the problem, if you will. And so you have to decide that you are going to be part of the solution, not just an end purchaser.

And then you have to also, I think a lot of the ways we're doing this, for example, are through public/private partnerships. We are very big on public/private partnerships right now because the types of things we're trying to solve are so big and require a holistic approach. Those are not easy. Anyone who's in one knows nobody has fully cracked it, I don't believe, and they're not easy.

And one of the keys is recognizing that all of the partners in the circle have a reason to be there. And then I think it's about clarity and transparency about why you're there. I think business has to be clear that we're in it for business. This is not a PR game; this is not a CSR (Corporate Social Responsibility) game. There is a business reason that we are doing what we are doing. And if you are transparent about it and honest about it and you do it in a way that there is a win-win-win, then it makes sense.

And I think the same for civil society and the same for government. Everybody can win, but not if we're playing games and not if we're really not clear and transparent and committed to what we all put in and what we all get out of these partnerships.

Gordon Conway

I still want to know how you start. Beth, is it the link with the market? Is it connecting a farmer to the market?

Beth Keck

Actually, you start where you have business necessity and where you have low-hanging fruit. And in our case in terms of linking smallholders to the market, it was clearly a business necessity. When that business was started in Central America with supermarkets, they needed fresh produce, and they needed it with a short supply chain – and that meant engaging farmers. And that's helped us create this business model.

That was interesting – as we started working on our sustainable agriculture strategy, the first thing we did is we went around the world and we said, "Well, what are we doing?" And we discovered that this need to link the smaller farmer to the market was a need in every one of our markets.

We were indigenously creating these models independent of each other, and we discovered actually through this more holistic approach of looking at our business that we could then create leverage and really build off of our best in class business in Central America.

When you start with a business necessity, then you can add on other attributes, such as the social and the environmental attributes, and they're sustainable within that system. I think your experience is really very moving about how by improving your income you were able to improve educational opportunities for your daughter and your son.

And we've seen that as well. And if we can get partners to work in those same communities where we can make the market link, it can be a really powerful poverty alleviation story and self-perpetuating.

The second way to start is with low-hanging fruit, and that's particularly on the harder value chains. And we're doing that in the commercial farming sector with produce. We took those pillars I showed you - they're all supported by very public, measurable goals.

For example, on smallholders, our goal is to be selling a billion dollars in food that we supply from a million small and medium farmers around the world in emerging markets in the next five years. So we have a billion-dollar sales goal that we're wanting to get this level of this farmer integrated into our supply chain.

On the commercial side, we looked at that; and, you know, many of the growers that we buy from have incredible sustainability stories.

I was on a pistachio farm last week in California. That grower, his trees will grow for a hundred years. He has solar panels providing 70 percent of the energy that is powering the processing with recapturing the water, because there's a lot of water that goes into the processing of those pistachios.

And so we see a lot of very proactive activity in the large, commercial sector. But there's opportunity to do more.

And so to figure out where those opportunities are, we're trying to be more systematic. And so we committed that we would put in place a produce assessment so we would then have our top growers in our global sourcing system fill out. And we'll do that by the end of this year.

And it's not rocket science. We all know what goes into to grow a piece of fruit or to grow a potato. But we're trying to understand what that is - you know, how much water, how much pesticide, and what does that look like - and then create some pre-competitive space where, if I'm a grower next to another, you have fairly similar parameters, and you can see that, oh, this person may be having more efficiency here than me. What is he or she doing that's different?

And we've had great success actually with dairy farmers in the UK. We're working with a co-op. And it used to be that our dairy farmers - we have 60 of them that we're working directly with, and we have full traceability of that supply chain.

And they were working very independently, because farmers are very independent. And we started through the co-op, saying: "Let's figure out what the best practices are." And so now if a farmer is getting ready to invest in improving his milking parlor, etc., they're now talking to each other and learning from each other and making better investments and achieving better efficiency.

So we're trying to find ways to facilitate that so that you have more efficiency, better environmental outcomes, and better social outcomes. And then our customers get the benefit of that efficiency through better pricing.

Gordon Conway

Thank you. I like the example of milk in the UK, apart from the fact that I sometimes drink it, but what is interesting there is the importance of cooperative associations and cooperative movements. I mean, for example, all the milk in the Netherlands is cooperative - every single drop. And there's a long but rather mixed history about cooperative movements in Africa. But in many ways, the co-ops and others make a value chain work, and I guess that's true.

I want to ask Mrs. Silas -if you were linked to either of the companies on your right, what do you think they might be able to do for you - Wal-Mart or Kraft Foods? What would you like them to do?

Silas Buru

Of course, we have some challenges, like roads. Marketing is also a problem, but in the future we would like [companies] to support us in marketing and road construction. Electricity is also very important because still we are cutting trees. We would also like the promotion of small and micro enterprises as we are producing a lot of fruits and vegetables, but the postharvest storage and packaging systems are not developed side by side.

We would like the private sector to join rural communities in order to maximize our value chain and the productivity.

Gordon Conway

Beth or Perry, what could you do, again, what could you do? Microenterprises sounds like a way. Either of you want to respond on what you heard that she produces on her farm?

Perry Yeatman

Beth and I agree that it's about the business, right? So how do we pick cocoa and cashews? We're big to it, it's big to us - it's that simple. And we're one of the largest buyers of those two things. So when there's a problem in that supply chain, that's why we would focus there and begin the discussions there.

In terms of what we would do, microenterprise is something we are very interested in. We have a different partnership in Indonesia that is geared actually around smallholder farming, creating farms for women in Indonesia in order to actually generate food security.

It's back to this nexus we've been talking about - the whole point of these farms is to enable their villagers to produce the nutrition and food they need, which then becomes a microenterprise.

And then we're supplementing that with carts where you can actually put basic hygiene products, fortified foods, etc., so that you're creating a little model there where you have more access, more information, and more income to buy what you want. And that is all about microenterprise.

Gordon Conway

Okay. Do you want to add to that, Beth?

Beth Keck

Yeah. You have a great list here of things that you have suggested and need. And I think it really does illustrate the need for partnerships. Because as a retailer, the most powerful case that we can bring is a purchase order for your fruits and vegetables. That's the number one item that we have to offer.

And then the question, of course, is: after you get the vegetables picked, washed and packaged appropriately, how do you get them to us so that they're in a condition that our customers will want to buy?

And in some cases and in some markets, it makes a lot of sense for a retailer to be investing higher up the value chain, but it really depends upon the situation in terms of the overall government structure and support for retailing. For example, in a country where there are a lot of issues because of government regulation or inability to have full market entry, how can we put capital investment into a cold supply chain if we can't even own the retail outlets? So that's a government barrier that needs to be addressed.

Another issue is roads. We've looked at how we partner with development organizations to get farmers into our supply chain, and the most important thing is infrastructure to get that vegetable through a cold chain to us so it really looks good the next day in our store.

And building roads also takes cooperation with governments to make that happen. And so what we've found quite successful is that as organized retail expands, there are farmers in need outside of urban areas, and those tend to be the first catchments that benefit from organized retail. It's very, very difficult to get those farmers on the west side of India connected to our marketplace. And so we need really ready-for-market farmers.

Gordon Conway

That issue of infrastructure is absolutely crucial. Carl, the last part of the last ten minutes we've got I want to talk a little bit about risk. You have seen a lot of approaches to reducing risk in your travels. In China, of course, it's very much about building the kind of infrastructure that is protective as well as in the broader sense and is resilient. In China it's very much public investment, but elsewhere it's probably more public/private. Do you want to just comment on that?

J. Carl Ganter

Yeah, absolutely. I think it comes back to the data in the pull-through. So what are the incentives for companies and even for the public to get engaged in this? So how do we create that structure? We called it just last week at the Economic Forum - a resource scarcity period.

And so we have kind of two choices. We have a gold rush mentality, which we're seeing some of. Or we have an unprecedented opportunity to reengineer the system and be much more

efficient about how we make those choices in a cooperative environment. And so we need to break down those silos.

It also comes down to a long-term ethic with risk awareness and choosing that longer, sometimes more difficult path, whether it's big investments in infrastructure or even right down at the most local, simple irrigation and crop rotations and insurance programs.

Gordon Conway

I'm afraid I've just had a note to say I've got to stop right now – just as we were getting into some fascinating stuff about risk. Because Secretary Vilsack has got to start the next session early so he can get his plane.

And so I'm sorry about this because this issue of risk, and particularly I wanted to hear more from Mrs. Silas about her crop insurance. But we are going to have to stop.

I want to stop with just one statistic. According to the United Nations, the seven billionth on the planet is going to be born today, and that person undoubtedly will be born on a smallholding somewhere in Africa or Asia. And I'm just hopeful that many of the things we've talked about now will help that next generation – because for sure that seven billionth person is the next generation.

I really want to thank everybody on the platform, Perry and Beth, Silas, Carl and Shenggen, and I'm sorry that we've had to cut this short just as we were getting into something really fascinating. But thank you all very much.