



TAKE IT TO THE FARMER: Reaching the World's Smallholders



2010 BORLAUG DIALOGUE

HIGHLIGHTS





AMBASSADOR KENNETH QUINN
President, The World Food Prize Foundation

“This year, for the first time ever, we topped 1,000 participants, with guests attending from over 65 countries. We are thrilled that Sir Gordon Conway has called this ‘the premier conference in the world on global agriculture.’”

- Amb. Kenneth M. Quinn, President of The World Food Prize

PRESIDENT’S WELCOME

The last words Norman Borlaug uttered before he passed away were “Take it to the farmer.” At the 2010 World Food Prize International Symposium, we endeavored to fulfill Norm’s last wishes by building this year’s conference around the theme “Take It to the Farmer: Reaching the World’s Smallholders.”

We invited over 60 international smallholder farmers to attend and offer their perspective from the ground level, and to interact with global leaders, researchers and business executives to explore how everyone can most effectively work together to create more and better food in the decades ahead.

We also paid special tribute to John Ruan, Sr., Norm’s partner in rescuing The World Food Prize, who passed away in February 2010. With the Ruan family’s support, our annual conference has grown immensely over the past decade, from what was a half-day event attracting only 50 people from outside Iowa, to a three-day major gathering in conjunction with World Food Day, featuring some of the world’s most renowned experts from agriculture,

development and government to talk about the most pressing issues in food and agriculture. Our goal is to illuminate the challenges and identify solutions, and bring together the best minds of our time.

I am pleased to share with you that this year, for the first time ever, we topped 1,000 participants, with guests attending from over 65 countries. We are thrilled that Sir Gordon Conway has called this “the premier conference in the world on global agriculture.”

The dialogue this year was especially rich:

- We were honored to have Howard G. Buffett, himself a farmer and a major contributor to global hunger-fighting initiatives, kick off the symposium with touching stories from his travels in developing nations.

- It was a very special privilege to have H.E. Kofi Annan deliver the keynote address on Thursday morning, speaking from years of experience in global development, and outlining efforts to bring the next Green Revolution to Africa.

- Gates Foundation CEO Jeff Raikes delivered a moving address, and U.S.

Secretary of Agriculture Tom Vilsack hosted an excellent roundtable discussion with his counterparts, H.E. Mohammad Rahimi of Afghanistan and H.E. Nazam Gondal of Pakistan. Secretary Vilsack also made a special announcement that USDA is creating a new Wallace-Carver internship program directly linked to our World Food Prize Global Youth Institute.

Given our focus on smallholders, it was most fitting that we honored two outstanding grassroots advocacy leaders as our 2010 World Food Prize Laureates: David Beckmann, president of Bread for the World, and Jo Luck, president of Heifer International.

In 2011, The World Food Prize will celebrate its 25th Anniversary with a conference that will focus on “The Next Generation,” and will include the Grand Opening of the Norman E. Borlaug Hall of Laureates, the new home for The World Food Prize and a place to educate future generations about the issues and achievements we all work on. Please mark October 12-14 on your calendar and plan to join us for this momentous occasion. ■





20



30



44



74



80



88



92



99

2010 BORLAUG DIALOGUE

Take It to the Farmer: Reaching the World's Smallholders

6 REMEMBERING JOHN RUAN

12 OPENING KEYNOTE: "To address hunger, there is no simple answer."
Howard Buffett

14 PRESENTATION: Who is the Smallholder Farmer?
Prabhu Pingali

16 CONVERSATION: Smallholder Successes Around the World
Pedro Sanchez, Shenggen Fan, Ruth Oniang'o, Ajay Vashee, Vo-Tong Xuan

20 CONVERSATION: Promoting Smallholders as Entrepreneurs and Innovators
Louise Fresco, Marco Ferroni, Eleni Gabre-Madhin, Kamal El-Kheshen, Rajesh Kumar, Shivaji Pandey

24 CONVERSATION: Overcoming Major Constraints Facing Smallholders
Uma Lele, Jessica Adelman, Rolf Derpsch, Joe DeVries, Stephanie Hanson, Nuhu Hatibu, Sarah Munalula

30 KEYNOTE: Speeding the Forces for Change to End Hunger in Africa
H.E. Kofi Annan

34 CONVERSATION: Smallholder Agriculture and Biodiversity
M.S. Swaminathan, Christian Borgemeister, Christopher Flavin, Dennis Garrity, Guilmer Miguel Montufar, Suyapa Ucles Salinas

38 PRESENTATION: Smallholders in a Changing Climate
Sir Gordon Conway

38 SYMPOSIUM LUNCHEON
KEYNOTE: Progress in Agricultural Development
Jeff Raikes

44 THE SECRETARY'S ROUNDTABLE
Hon. Tom Vilsack, H.E. Nazar Gondal, H.E. Mohammad Rahimi

48 KEYNOTE: Private-sector Leadership in Partnering with Smallholders
Gregory Page

50 CONVERSATION: Partnering with Smallholders on Strategies for Food Security
Sean de Cleene, Gabriela Cruz, Hon. Jose Fernandez, Matt Kistler, Robert Zeigler

56 SYMPOSIUM BREAKFAST: Renewed Global Focus on Fighting Hunger
Hon. Rajiv Shah

58 PRESENTATION: Land Issues Facing Smallholders
Camilla Toulmin

62 CONVERSATION: Producing More Food and Better Food
Philip Nelson, Howarth Bouis, H.E. Florence Chenoweth, Dyno Keatinge, Jacqueline Morette, Joseph Taets, Derek Yach

68 CONVERSATION: The Role of Livestock in Supporting Smallholder Agriculture
Alice Pell, Nao Bee Lor, Christie Peacock, Carlos Seré, Thad Simons, Deepak Tikku

74 2010 LAUREATES
David Beckmann and Jo Luck

82 2010 WORLD FOOD PRIZE LAUREATE AWARD CEREMONY

88 SIDE EVENTS: Iowa Hunger Summit and More

92 THE WORLD FOOD PRIZE GLOBAL YOUTH INSTITUTE

99 LOOKING TO THE FUTURE

This publication includes highlights from the Borlaug Dialogue. Find complete transcripts, videos and audio at www.worldfoodprize.org.



JOHN RUAN

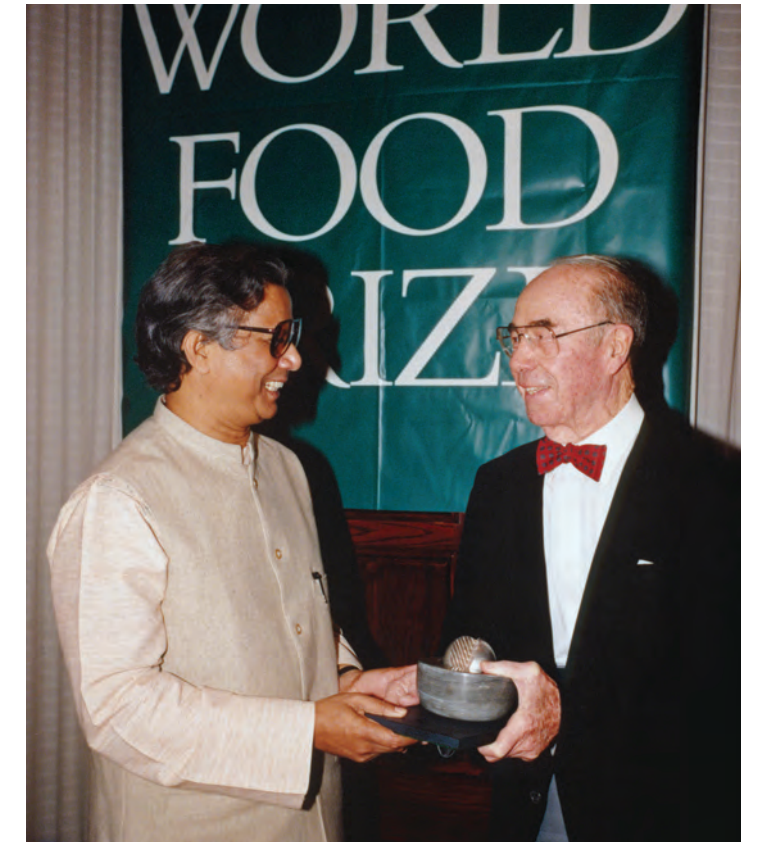
Charman Emeritus, The World Food Prize

“I pledge my own energies and resources to these real-life heroes of our day whose work not only touches the soil but also touches the hearts of all mankind. By assuming sponsorship of the World Food Prize, we can create a most appropriate nurturing environment for it right here in what is often called ‘the nation’s breadbasket.’”

-John Ruan, 1990



JOHN RUAN WITH NORMAN BORLAUG



JOHN RUAN AWARDS MUHAMMAD YUNUS THE WORLD FOOD PRIZE IN 1994.

REMEMBERING JOHN RUAN

One of Iowa’s most successful businessmen, World Food Prize Chairman Emeritus John Ruan was a well-known philanthropist who strongly believed that Iowa should be seen as the agricultural capital of the world.

In 1990, when the future of the World Food Prize was in serious jeopardy after its original sponsor withdrew financial support, Ruan held a fortuitous meeting with World Food Prize founder and fellow small-town Iowan Norman Borlaug. Finding common goals and an instant partnership, Ruan stepped forward to save the World Food Prize with a \$10 million endowment and established the Des Moines-based World Food Prize Foundation.

“I pledge my own energies and resources to these real-life heroes of our day whose work not only touches the soil but also touches the hearts of all mankind,” Ruan said at

a 1990 press conference. “By assuming sponsorship of the World Food Prize, we can create a most appropriate nurturing environment for it right here in what is often called ‘the nation’s breadbasket.’”

In 1994, Ruan created the World Food Prize Global Youth Institute to foster interest in science and agriculture and increase awareness of critical issues of food security among high school students.

Working with Dr. Borlaug, they created the Borlaug-Ruan International Internship program in 1998. Since its inception, over 140 high school students have been sent on all-expenses-paid internships at leading research centers in Africa, Asia, Latin America and the Middle East.

As the chairman and CEO of the Ruan Companies, Ruan presided over a diversified group of businesses including transportation, commercial banking, financial services, international trading and

real estate development.

Ruan also played a key role in the development of the Des Moines metropolitan area. In the early 1970s, Ruan built the 36-story Ruan Center to house the administration of the growing number of Ruan companies. Ruan built the 33-story Marriott Hotel in 1980 and the 14-story Two Ruan Center in 1982.

He was active in the development and building of Des Moines’ extensive skywalk system, the Des Moines Convention Center and several parking ramps in the downtown area. The Ruan family also owns the Bankers Trust Company, the largest independent bank in Iowa. Ruan also founded the Iowa Export-Import Trading Company, a business involving over 50 nations around the world.

Mr. Ruan died on February 14, 2010, at the age of 96. ■



Artwork by Richard Shook

Take It to the Farmer: Reaching the World's Smallholders

Inspired by the last words of World Food Prize Founder Dr. Norman Borlaug, the 2010 Borlaug Dialogue gathered global experts and leaders in agriculture, food and development for a special focus on the world's smallholder farmers.

Discussions addressed topics including: challenges facing smallholder farmers and their communities; preserving soil, water, and biodiversity resources; the role of livestock in global agriculture and rural livelihoods; smallholders in agricultural markets and global trade; and grassroots partnerships toward food security.

These and other critical issues were explored through informative keynote presentations and lively "conversation" sessions featuring diverse policy-makers, key private-sector and NGO executives, scientific and academic experts, and development leaders – alongside farmers from around the world – to better ensure that global efforts to improve agriculture and food security directly benefit those women, men, and children most in need of uplifting.

FARMER PERSPECTIVES

Smallholder Farmers Share Their Stories



RAJESH KUMAR
Farmer, India

“I went to college for a degree in business management and I went for a job after that. Many people were leaving farming for the cities to work. But I thought farming in India had a lot of opportunity, and I came back and started on my two-hectare farm and experimented. Being on a small farm, I couldn’t grow much on a large scale, and [instead] went with horticulture crops, growing vegetables and fruits.”

“We need to differentiate progress and success. Progress for a smallholder is the ability to eat bread, which you were not eating, or more nutritional food. Success is to have the income, beyond feeding your family, to decide what food to buy or produce for your family. A lot of people think the idea is to increase productivity and we’ve sorted out food security.”



AJAY VASHEE
*Farmer, Zambia, and President,
International Federation of
Agricultural Producers*



SARAH MUNALULA
Farmer, Zambia

“In 1990 I stopped school, and I found it very challenging as a small-scale farmer. I didn’t have enough resources. From 1990 to 2007 I had been planting uncertified seeds because I had no option. I’m a peasant farmer who only depends on conservation, and I don’t use any reaper. I depend on my back with my children. They help me in the farm, dig the holes. If I don’t have enough fertilizer, we go and look for cow dung to apply into my field so that I can keep the family surviving.

“I own 6 hectares but only manage 1 hectare due to lack of farming implements and farming inputs. That hectare never progressed until I met this Pioneer variety 30D79. It was a hectare. I used conservation type of method. It did wonders for me. In 2007-2008, I managed to harvest 80 times 50 kilograms of maize. Then 2008-2009, I harvested 90 times 50 kilograms of maize. I sold some and reserved some for food. I paid for my children’s school fees, bought some clothing, and reserved some money for the food balance, the diet for my children.”



HOWARD BUFFETT
President, Howard G. Buffett Foundation

OPENING KEYNOTE

“To address hunger, there is no simple answer.”

I got started in farming about 25-30 years ago, and had very limited experience. A neighbor asked me one day if I would help prepare a field and go out and disk. So I'm disking away, in this area where there are different terraces and I get done with the terraces. It's starting to get dark, and I think, "I should move up to the next one and get it done." So I move up to the next one. There's not very good lights on this tractor, and this field looks a little different.

Pretty soon there's this vehicle roaring up behind me, and [my neighbor]'s son jumps out and says, "Howard, get this tractor out of the field! My dad might not see that you just disked up the corn he planted!" My prospects of being a farmer at that point weren't very good. But the key thing is — he could replant that corn. Even if he didn't, his family didn't have any large consequences as a result. It's completely in contrast to Central America and Africa. In those countries, the losses of crop can have a devastating impact; severe consequences.

When I visit places like Sudan or Zambia or Mali, I try to get a group of women separate from the men. I ask if these women experience hunger, and they nod. I want to understand what they live through. I don't want to read it in a book and theorize about it. I ask, "How do you choose which child to feed?" That's a pretty difficult question to

ask someone, and it's an even more difficult question to answer. Sometimes the answer will describe sorting through rotting crops, digging up tree roots, boiling leaves or tree bark. But oftentimes they will tell me even that alone will only be the meal for the next few days. And occasionally they tell me of when they lost a child.

That farmers go hungry, and that their children die of malnutrition, is a pretty big paradigm shift. On my farm, I'm proud that I can feed 152-156 people in the world. [But] GPS, super hybrid seeds, mono-cropping systems are not always appropriate for populations that live on a dollar or a few dollars a day. Context is pretty important. When 60% of hunger is a result of conflict, standard answers don't provide the solutions — the challenges of poor infrastructure, limited distribution networks, costly agricultural inputs, disease, depleted soils, and multiple agro-growing zones mean that we need to be more innovative, more flexible, and more willing to try different solutions.

The relationship to hunger isn't always evident. Immigrants migrate because they can't produce enough food to feed their family; some of them end up dying trying to get to a better life. A boy might be sniffing glue, trying to deaden the pain from hunger. Children get their only meal of the day through a school feeding program. A

refugee has lost her crops and livelihood because of a conflict that she has nothing to do with, no stake in the game. A person with HIV/AIDS receives the antivirals that he or she needs, but they don't have the nutrition to benefit from that medicine. Food is so basic and touches every aspect of life, but it may not always be that obvious.

In Angola 10 years ago, we were driving and, everywhere, there were fresh graves three or four feet long. You could look around and see children that would not be alive in a week. A woman came up and thrust her baby at me, talking frantically. She was telling me that her son had just died, she had no milk left, the baby would not survive, and that that baby's life was in my hands.

You don't just go home after an experience like that and forget it. That was where I decided I was going to understand what it took to address hunger. It is an amazing expense, the logistics are incredible, the therapeutic feeding, the need for general feeding so that if you distribute seeds they don't cook the seeds because they're starving — there is just no simple answer. Food security is complicated. Agriculture is complicated. And when I understood what it took just to save one village from starvation, it was quite overwhelming to think about what it would take to do that, village after village after village, across the

continent.

These villagers are often net buyers of food. They farm two or three acres of land, have limited access to markets, limited inputs, limited extension services. They don't know what soil pH is, what organic matter means to them. Mechanization has little value, and they rely on planting the same seeds one year to the next, which has tremendous negative impact on productivity. We need to approach agricultural development in these circumstances differently.

The first thing you do is identify what you can impact. And this is something 10 years ago I didn't believe — but policy and advocacy really count, more than any other single activity. You must build a system based on the advantages that these farmers offer, not a blueprint based on investments we've made here in the United States or in Western agriculture in temperate growing zones. We have to learn how to take the advantages that these farmers have and apply them. And we must embrace smallholder farmers as part of the solution and never look at them as an impediment to success in the future.

If you view African agriculture as a pyramid and look at the top, the commercial farmers; and then look at the smallholder farmers that have access to markets; then you go to the bottom of the pyramid, which can be as much as 90% of the farmers in a country — you understand that it takes very different solutions for those different demographics, and the bottom of the pyramid is very difficult to reach, and there are no simple solutions to help that group.

As a farmer myself, I can tell you that just simply distributing seeds and fertilizer is going to fail long-term. Improved seeds used on depleted soils aren't going to accomplish much. And synthetic fertilizers spread on soil with no organic matter or biologic activity has limitations. Hooking some of the poorest populations in the world on fossil-based fertilizers is not going to be a great solution. We have looked at breadbasket areas, and we support the PASS seed program. The virus-resistant sweet potato, we've worked with the Danforth Plant Science Center in partnership with that. We've co-funded two projects for drought-tolerant maize with the Gates Foundation. These all have promise and they're all very important. But they don't provide much of a solution today for a lot of poor farmers.

What we really need in Africa is a "Brown Revolution" — a soil revolution. We have to regenerate and use the soil as a way to



HOWARD BUFFETT HELPS DISTRIBUTE MEALS FOR A SCHOOL FEEDING PROGRAM IN SIERRA LEONE.

increase production before we can look at seeds and fertilizer as an option. It's going to involve training and research and lagoons and inter-cropping and agroforestry. We've had great success with cover crops, no-till, basin planting and mulching in a lot of the countries where we've worked, and these have increased yields threefold with no synthetic fertilizers.

Africa is not Southeast Asia, with large expanses of rice fields, or India for that matter, with wheat upon wheat fields. We have to look at the diversity that is required in ways that are culturally acceptable. African farmers depend on cassava, cow peas, edible beans, brown nuts, bananas, millet, sorghum, potatoes — these were never part of the Green Revolution. I'm all for the Green Revolution, I've lived it and I love it, but we have to understand what applies and what doesn't apply to farmers.

There's a lot of hope with farmers. They're innovators and they'll take risks, and they'll try new things. But there's no quick fix. People who think about agriculture in terms of a few years get this wrong. It's going to take decades, and there is no simple way to overcome some of the issues in front of us.

Poor farmers are poor individuals. Simply increasing yields because they're farmers does not address the dynamics of poverty. That is the most challenging part of our work and a critical element of when people oversimplify what the answers are.

Implementing projects that simply result in activities may help a given population in a specific time period, but projects end, everybody goes home, and the future of those people hasn't changed that much in the long term. If there's no market,

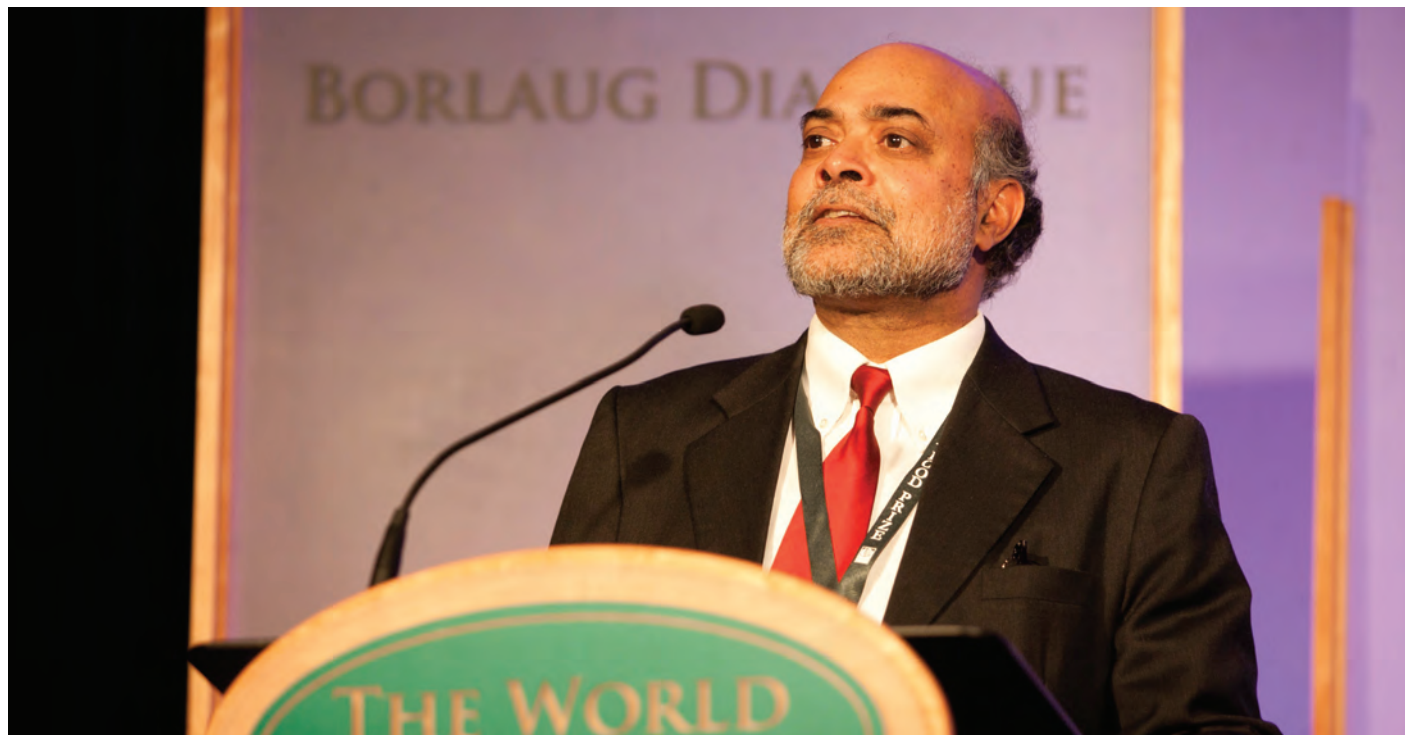
then all the production in the world has limited value once you achieve food security. Markets are the key to moving farmers from poverty into the economy. And all this matters little if you have poor policies in place. You can't create long-term, productive, positive change without good, fair policies.

As a result of these lessons, we got involved in what's called Purchase for Progress back in October 2007. Incredible leadership has been provided by Josette Sheeran of the World Food Programme.

It's not driven by the philosophy that we're going to give anything to anybody. No farmer is going to receive free seeds or fertilizer. No government is going to hand out vouchers. No NGO is going to develop a list of activities. Government support through credit, the use of private enterprise through inputs, and the market opportunity provided by WFP — these are the key ingredients.

This isn't a new concept. I've seen it in Oaxaca and Chiapas, Mexico, and I've seen it very successful. But this is going to be at a new scale. The success will be when our commitment expires and these 30,000 farmers are part of the economy, with no need for further support. And the final success is when these farmers no longer sell to WFP, but sell to Maseca and Bimbo or some other company.

Endeavors like this give me hope. I am a bit pessimistic; the challenges are pretty great. But it gives me hope that someday there's going to be fewer mothers who feel they need to hand their child to a stranger to preserve life. ■



PRABHU PINGALI
*Deputy Director, Agricultural Development,
 the Bill & Melinda Gates Foundation*

PRESENTATION

Who is the Smallholder Farmer?

For decades, hundreds of studies looking at smallholder agriculture were done across continents, across crops, across time. And all of these studies show that under the right circumstances smallholders can be just as productive, innovative, competitive, and risk-taking as larger farmers. The Green Revolution led to the dramatic transformation not just of Asian agriculture but Asian economies and the rise of the BRICs, and the rise of Southeast Asian economies and Latin American economies. And the Green Revolution took place on the backs of smallholders across the developing world.

A smallholder farmer in the Indian Punjab with less than one hectare of land in the '60s was growing one crop a year, rice or wheat, and producing about a ton. By the '70s the same farmer was growing two crops with each crop yielding four to five tons per hectare. Some of them even managed to grow a crop of vegetables or fodder crops in between. At the time of the household responsibility system introduced in the early '80s in China, Chinese rural

households were allocated one mu of land, one-fifteenth of a hectare. The Chinese Green Revolution took place on that mu, on the ability of the Chinese farmers to extract the most that they could get out of that mu. Rural women in India with one or two cows created the White Revolution and made India the largest dairy-producing country in the world.

But the Green Revolution did not just have an impact on production and on productivity. I was born in a South Indian rice-growing village, and I consider myself part of a generation that benefited directly from the productivity gains of the Green Revolution. My schooling, my college, were paid for because of the gains on our farm. My ability to leave the farm resulted directly from the productivity growth that took place. That's the story of the Green Revolution for millions and millions of youth around the world who are now middle and upper-middle aged today.

A smallholder could be a subsistence farmer eking a living out of a tiny plot of land. She could be a post-Green Revolution farmer trying to sustain productivity

gains. She could be a commercializing farmer trying to link up to the value chain that connects to local, regional markets, and even global markets. These are all smallholders, but the needs of each are very different. The challenge for us is to find the right solution for the right group of farmers and take it to them.

Let me focus on the smallholder subsistence farmer – generally a woman, with less than two hectares of land, living on less than \$1 a day, with poor access to inputs, to technology, extension, credit, etc. A farmer who sees, in her own generation, farm sizes dropping because her children need to have this farm divided among them – they have no opportunities outside the farm for employment. A farmer who sees her production being extremely variable, and the variability is going to increase further as the impacts of climate change kick in.

Some argue that agriculture is not a pathway out of poverty. Think about Madagascar, where 70% of the population lives below \$1 a day and the majority of them are in rural areas. If Madagascar does

“For decades, hundreds of studies looking at smallholder agriculture were done across continents, across crops, across time. And all of these studies show that under the right circumstances smallholders can be just as productive, innovative, competitive, and risk-taking as larger farmers.”

not approach poverty reduction through agricultural productivity growth, what other option is there?

Some argue that the way to move smallholder agriculture forward is actually amalgamate smallholders into large farms and use smallholders as labor. Once you do amalgamate these populations into larger farms, then the binding constraint on that farm becomes the management and supervision of these dozens and dozens of laborers. And as that constraint becomes binding, you find these large farms moving away from labor, using more labor-saving technologies, mechanization, etc., and thereby displacing the very populations that these farms were set up to protect.

Moreover, a large-farm strategy doesn't bring you poverty reduction. China and Brazil both have had fairly similar levels of agricultural development and productivity growth over the last three to four decades. But the poverty drop in China was dramatic right from the start, whereas in Brazil it took a significantly longer time period, and it was only recently, with very proactive poverty-reduction programs, that we've seen drops in poverty. Brazil followed much more of a larger-farm strategy, whereas China was very focused on smallholder productivity growth.

I don't think the smallness of the farm is the problem. The problem is the failure to provide the technology, infrastructure, institutional environment, and incentive systems that allow smallholders to flourish. It's been the failure of the state to take it to the farmer. And unless you get the

conditions right, you will not see the change taking place.

The first condition is something we rarely talk about. It's peace, stability, and good governance. Mozambique, Rwanda, Angola have come out of decades of conflict, and agricultural productivity is moving upwards in all of these countries. Then think about the former breadbasket of Africa, Zimbabwe, and the depressing, downward spiral Zimbabwe is in. That's the difference in terms of peace, stability, and good governance.

The second condition is access to land and other production resources. Without secure access to land, you will not see smallholder productivity rising. Vietnam for decades was a food deficit country. In the late '80s Vietnam went through a liberalization program called Doi Moi. Smallholders were given their land back with secure tenure. They were given access to technologies, credit, etc. And what happened? Within three years Vietnam went from being a net importer of rice to the third largest rice-exporting country in the world. It's happened in Africa. Remember the Ujaama experiment that took place in the '60s and '70s and '80s in Tanzania, when all land was brought together into collective farms in Tanzania. Once that experiment was dismantled and the land was returned back to the peasants, we saw a dramatic turnaround in productivity.

you're not only not going to see incentives for increasing productivity – you're not going to see the market signals, the price transmissions that are so necessary for signaling to farmers what's needed by the outside market.

The fourth condition is technology, investing in R&D. We know the impact the CGIAR has had; the returns to investment have been uniformly high across the CGIAR and over time. The issue has not been technology itself. The issue has been the delivery. Even 50 years after we started extensive work in agricultural R&D, we don't have one good example of a viable extension system that works at scale for smallholder agriculture. The initial, easy gains have been made. The next set of gains have to come by tackling the really difficult problems of drought, high temperature, submergence, major pest problems — all related to crops that are important to the poor, such as cassava, millet, sorghum, coffee. We need to invest much more in tropical agricultural science, in things like the physiology of the cassava plant. This is work needs to be done from scratch, rather than being able to transfer existing knowledge from OECD labs and OECD universities.

The fifth area is incentives. Farmers just will not make those investments without the right prices, without the right policy environment. At the international trade

“I was born in a South Indian rice-growing village, and I consider myself part of a generation that benefited directly from the productivity gains of the Green Revolution. My schooling, my college, were paid for because of the gains on our farm. My ability to leave the farm resulted directly from the productivity growth that took place. That's the story of the Green Revolution for millions and millions of youth around the world who are now middle and upper-middle aged today.”

The third condition is investments in infrastructure and markets. At the start of the Green Revolution in India, rural density was around 400 kilometers per 1,000 kilometers square. Compare 1970 India to where Africa is today. The rural density in Ethiopia is 40 kilometers per 1,000 kilometers square. The rural density in Senegal is 70 kilometers per 1,000 kilometers square. If you don't have massive investments in roads, transport, irrigation,

level, you still have enormous distortions in the market. Think about the protection for cotton in OECD countries and the devastating effect it has on smallholder cotton production in West Africa. At the domestic level, countries are beginning to see the impact of discriminating against the agricultural sector, but there's still a long way to go before agriculture is on a level playing field with the rest of the economy, especially the urban sector. ■



PEDRO SANCHEZ
Director of Tropical Agriculture, the Earth Institute at Columbia University



SHENGGEN FAN
Director-General, International Food Policy Research Institute



RUTH ONIANG'O
Editor, African Journal of Food, Agriculture, Nutrition and Development

CONVERSATION Smallholder Successes Around the World

Pedro Sanchez: The African Green Revolution is at scale now, going from 1 to 3 tons per hectare of basic food grains, maize, camel milk, cocoa, and many other commodities. In the Millennium Villages, more than 78% of households have exceeded 3 tons per hectare, and child stunting has decreased dramatically. You adapt to climate change as well. At 1 ton per hectare, with the soil exposed, about two-thirds of soil moisture is lost by evaporation. When you shift to 3 tons and the crop canopy covers the soil, you lose only one-third by evaporation, and then you put two-thirds into transpiration, which is what we need.

Malawi's maize yields have gone from 0.8 tons per hectare in 2005 to 2 tons per hectare. Malawi's example has stimulated others. 20 million Nigerians [are] applying Millennium Villages' concepts with Nigerian money. There's a major scale-up in Mali for the Millennium Villages and advances in Tanzania and other countries – all have surpassed 10% of their budget in agriculture. Malawi going from an importer to a food exporter is the same as [in] Vietnam and India.

Shenggen Fan: The comprehensive approach to help farmers' access to inputs, technologies, markets, rural infrastructure – this is all very important. The question is, how? African [governments] only invest 4% of their national budget in agriculture, compared to 8-10% in Asia. Africa has to increase its agriculture budget. But they're also struggling with feeding people in the short run – food aid, social protection [for] the poor. We can combine these so, on the one hand, we increase farmers' productivity and, on the other, make sure social protection help farmers build assets – and then they graduate from social protection or food aid. Our studies in Ethiopia clearly show that if these types of investment are combined, the returns are very high.

Vietnam, China, India succeeded in transforming smallholders, but different types of policy played a critical role. In India, investment in irrigation, agricultural research, initial subsidies, and rural roads; in China, liberalization of trade, liberalization of markets, decentralization of production to small households. In Vietnam they decentralized the collectives to smallholders. Most of the policies in Africa are prescribed by researchers sitting in Washington, Paris, or Rome. Building policy-research capacity, I hope in the future policies in Africa are proposed by African researchers in Addis [Ababa] or Abuja.

Ruth Oniang'o: Renewed attention to African agriculture is a good thing, 30 years ago in Kenya, [in] the rural community, I was shocked by what I saw. Malnourished children, emaciated – in my own country, which was boasting of being food self-sufficient. A shortage of money is not the issue. If you put together the amount of resources Africa has received, you would not understand why we continue to have hunger, child malnutrition going up, maternal mortality increasing, lifespan moving from 56, when [Kenya] got independence in 1963, to 49 now.

Until [these resources] reach a woman in my village, I can't say there's any money going towards food and nutrition security. We have forgotten it is women who toil day and night on the farm. Technology, credit, information does not reach them. My mother was a farmer. Every week an extension worker used to come, in uniform, to teach her how to farm. We don't see that anymore. Women who have nothing – they don't have enough food – are the women we are relying on to feed the continent. I'd like NGO partnerships to create an environment where students [and] young people can serve as interns. When they

want to stay in Nairobi, tell them, "No. Let's go to the village"

Ajay Vashee: Smallholders have to work with standards, food safety, export markets, environmental issues. They have to understand the external influences impacting them. A lot of small farmers think there is no rain because the gods are angry; they don't realize the phenomena going on. How can we make them understand market dynamics, climate change, technical innovations, the opportunities outside the farm gate? And how do we give them the confidence to manage risks and harness those opportunities?

I'm not running away from the basic requirements of secure land tenure, water rights, predictable and consistent policies, credit, trade infrastructure. But we need to change the mindset of smallholders. Only if our interventions do that are we going to have real progress.

The other important issue is, how are we going to ensure that the smallholder participates in the governance of agriculture, the conception, design, and development of policies? This is universal – even big, commercial farmers are at the bottom of the chain. 80% of the risk is

carried by the farmers, and they only get 20% of the reward. If there's a change in prices, the income goes to other people in the chain. The farmer's price never changes, regardless of his scale of operation. We need strong farmers' organizations. When the food-price spike happened in 2008, many of those countries which had vibrant civil society were able to cushion the effect.

Vo-Tong Xuan: Vietnam today exports 7 million tons of rice, second to Thailand. All this is by the smallholder farmer in the Mekong Delta. These farmers could not grow that much without [seed] we got from the International Rice Research Institute, but this technology would not [have worked] if we did not have the right policies. In order for the farmers to use this technology, we must transfer this into the farmer's hand. We cannot just talk to them, but we have to do [this] hand in hand with them.

After the end of the war in 1975, two-thirds of the Mekong Delta rice was burdened by brown planthoppers. 2,000 students were trained to make a good seedling, to prepare a field for transplanting, and to transplant one seedling per yield. Each student would go out with one kilogram



AJAY VASHEE

Farmer, Zambia, and President, International Federation of Agricultural Producers

of IR36, to teach farmers directly to grow one-tenth of a hectare, and [after] only two crops per season, we were able to stop the damage of the brown planthoppers. So the students' transferring technology directly to the farmers really worked.

With that experience, today we can help African farmers. In Mozambique one private company, Ubuntu, got 5,000 hectares from the government, land that was abandoned by the farmers. These farmers were hired by us and our agronomist taught them how to grow our rice.

When our rice was about to head, these farmers said, "Before we didn't know that this land can grow rice. But now because you have taught us, and the rice is very good, we would like to get back to this land. You go away." So we had to move to another place, and these people now are going to take over this land. This, on one side, is too bad for us, because we had to find another place, but this is a success for the smallholder. Now they know that, in their own hands, that land can give them 5-6 tons of rice per hectare.

I must say that we are only one-half successful. It's easy to increase production, but very difficult to increase income.

Business is the center of this linking. They're the ones who have the market and can go back and reorganize the farmers – they're no longer small farmers anymore, but hundreds of smallholders become a big, big farmer who grow the same raw material, and then the business could process, brand it, and distribute. Then the profit will go back to the farmers and income will grow.

Fan: In the future this producer probably will diversify production [and grow] not only rice. In 30 [or] 40 years, we want to see these smallholders move to cities, enjoy a higher living standard, and the farm size can become bigger. This is already happening in China and some other economies. I would be very happy to see 3% of the Vietnamese population engaged in agriculture, or 2% in China, [and] the majority urbanized.

Oniang'o: We take democracy for granted. Because of bad governance on the African continent, most activities are run on a project-by-project basis. To ensure good productivity and long-term development, we need to be there for the long haul. But foreigners are not willing to invest, because they are never sure what is going to be there tomorrow. We have to put pressure on our governments to have

commitment, that they join the bulk of the world in democratizing their governance.

Fan: Government is very important. What government should not do is also a question. In Vietnam, when the rice technology was introduced, yield increased, but Vietnam had a rice export quota, so the price was artificially low. That really depressed farmers' income. Some analysis showed the government – okay, if the Vietnamese government can increase the rice export quota from 4 million tons right now to 7 or 8 million tons, then farmers can enjoy their income. So they transferred the welfare from consumers. Avoid transferring welfare from producers to consumers; that's very important.

Vashee: In southeastern Africa, farmers themselves have started agriculture research and extension by pooling funds from the produce they market. They are trying to fill a void.

Multilateral organizations have been prescribing over a number of years [that] government must disinvest in agriculture, must move away from extension [and] research. There has to be some limited intervention by government. [The] private sector can do a lot of extension



VO TONG XUAN

Vice President, Tan Tao University

cost-effectively themselves. But we need an in-between. People talk about how African agriculture must move from rain-fed agriculture to irrigation. But nobody is going to invest in dams and weirs and catchment areas; that has to be public-sector investment. We need to have a little bit of both if we want to move forward.

Oniang'o: I don't see extension the way it used to be coming back. What we see happening now is a project, like the Millennium Villages, where someone makes sure farmers are organized so that information can be relayed to them. You have IFDC in Rwanda doing the same thing. You have Heifer International.

But [for] farmers on their own, it's difficult. Working together, we can connect with the government to work with and organize farmers. But in terms of one project, to get information to farmers is not easy.

Sanchez: Can you convert some of the small farmers, in a world of small farmers, into larger farmers?

Xuan: Yes. In Vietnam, to increase income [for] small farmers, we are trying to link them into a production cooperative. Companies need a large amount of raw

materials, and a pure variety of rice. At [this] time 100 farmers in Vietnam grow about 20 varieties. That [is] not good for marketing. So we grouped them into big cooperatives, and they grow one variety. This large-scale production by many, many smallholders is my vision for Africa also, based on Mozambique, or Liberia. The African smallholders become bigger-scale, 10 hectares and one variety of rice, for the companies that are investing.

Vashee: You can have large-scale mechanized and smallholder agriculture, but there must be commercialization of small-scale agriculture where it's market-led, they're producing for a specific purpose, and you have the appropriate ingredients to go with it. You actually have better economies of scale if you can bulk up smallholders into [the] critical mass you want as a commodity buyer, to give you those quantities you want. There is a happy medium, again.

Fan: Large- and small-scale can live alongside, so the small-scale farmers can benefit from technology or markets that grow. But we have to be careful of this so-called land-grabbing – oil-rich countries from the Middle East, economies like

China, India, go to Africa to contract land to produce grains to ship them back to their own countries. Domestic land-grabbing is even more serious – a certain government tries to promote large-scale farming by taking land away from smallholders. If we don't do it carefully, many smallholders will lose their land.

Sanchez: In theory it's great what's happening with the 45-million hectare land-grabbing in Africa. But African governments have to benefit. I get worried when I see Chinese truck drivers and cooks imported from China to feed the Chinese workers while the local people have no stake, because it can politically backfire.

Oniang'o: The fear, especially for women, is that when you connect them to markets, other players come in. Whenever there's a market, there's a money issue, women lose out and we are back to square one. So that has to be very well managed. Even with the World Food Programme's Purchase for Progress, farmers in a food-deficit area sell all their grain – we have seen this happen – they end up again hungry. It has to be handled very carefully.

Fan: Smallholders contribute not just in rural areas, [but] the urban areas. If you look at China, India, Vietnam, agriculture paved a base for overall economic transformation and urbanized citizens. This needs to be remembered.

Smallholders contribute to overall society. Why are farmers treated badly? Because they do not have any political power. Empowering farmers, women farmers, is very critical, so they can challenge their government – Pedro mentioned political will. To empower the people, we can create the will.

Vashee: Whatever we do, let's ensure a farmer-centered approach, that it's equitable, there's fairness, there's transparency and accountability. And let's ourselves get out of this mindset where we target [only] the current situation of smallholders.

Sanchez: The thing is to help them out of subsistence, or sub-subsistence, and become small-scale entrepreneurs with a bank account and a business. You can always look down and [see] something wrong in Africa, but there are so many countries now that are serious about agriculture, that have reasonably good governance, that are committed.

I think 10 years from now, we'll be saying, "Remember when we were talking about all those horrible issues in Africa? Well, some of them are still there, but it's really improved." ■



LOUISE FRESCO
Professor, University of Amsterdam



MARCO FERRONI
Executive Director, Syngenta Foundation



ELENI GABRE-MADHIN
CEO, Ethiopian Commodity Exchange

CONVERSATION

Promoting Smallholders as Entrepreneurs and Innovators

Louise Fresco: Rabobank, the largest cooperative bank in the world, [has] a program to provide financial services in rural areas. I have seen where women for the first time saw a teller machine, in the middle of Tanzania, and [were] sure that they could put money in and get it out themselves and not have their money at risk of being stolen or misappropriated, even by husbands and family members. It's in combination with vouchers so that they could get the inputs before they had the money from their harvest. It changed that whole area.

[In] India, Unilever put a program in place to sell Lifebuoy soap to cooperatives of women farmers for less than a rupee, which they then sell to other women. These people are outside the normal market channels. It's only groups of women who can reach one another.

In both cases what was important was not that women were reached, as such; it

was entrepreneurship. Even in such simple conditions, there was market opportunity, and that special feeling that there is a chance and you have to grab it, however small.

Marco Ferroni: Farmers are innovators, they are eager. As recently as last week during a visit to the One Acre Fund in Kenya, it is very evident how shifting from broadcasting of seed to line planting can lead to sizable increases in yields and income. The question is, What are the services they enjoy or don't enjoy that enable them to be really entrepreneurial?

Three things are needed, irrespective of where [farmers] are, how big they are: technology, services, and access to markets. I think the driving element towards success in sustainable agricultural intensification, greater food security, and greater incomes, begins with the market question.

We can increase production through the right kinds of approaches to extension. Knowledge is actually the first binding

constraint. You want to bring science-based, external knowledge together [with] the farming systems, locally developed knowledge – and those two types of knowledge need to be married.

Eleni Gabre-Madhin: [In Ethiopia] we take agriculture very seriously and have made impressive gains over the last decade. However, we still have an overwhelming market concern.

The last 10 years, for all the major products, year-to-year price volatility was on the order of 50%. We've been for the last two years building a commodity exchange, a smallholder-oriented exchange. Our lot sizes are very small. 12% of our membership [is] cooperative unions, which represent 2.4 million smallholder farmers. Over the last 18 months, we've traded about \$1 billion of commodity without any contract default, payment delays, [or] order errors.

But very importantly, if we compare December-February 2008 to the same

period in 2009 – we saw a tripling of the share of coffee coming in at the top grades, which means a lot more farmers were getting better prices and willing to invest in that labor. This is not to say extension doesn't matter, but those things they did have been known and told to them by the extension system for the last 20 years. What did not exist is the market returns – that if they did those things, the market would reward them.

If we think of markets as returns to assets, then what are the assets we need to build? Smallholders are small because of their landholding, their capital holding – and also their know-how. So the appropriate intervention, alongside building markets, is to build up the ability of farmers to know the quality [and] quantity of what they have, and to store it.

Second is to build their human capacity to use this market – what a warehouse receipt is, how to look at the price boards and think of forward contracts, and so on.

The last is always going to be organization of capital.

We need better ways to organize these very small units into more viable market agents.

Fresco: We tend to forget that a sizable portion of small farmers grow horticulture

crops, with special needs and special demands in terms of funding, risk, [and] the supply chain.

Rajesh Kumar: On a small farm, I couldn't grow much on a large scale, and went with vegetables and fruits. One crop I thought had potential was sweet corn, a fairly new crop in India. Initially, being small, we [sold] directly to consumers. We used a vending kiosk to sell fresh sweet corn as well as grilled and steamed corn. We started with one; after five years, we have about 450 kiosks throughout southern India. And after that we started processing corn oils [and] the corn kernels were packed for a longer shelf life.

The landholding, some two hectares, has been expanded to 40 hectares. We are doing contract farming among nearly 350 farmers, 300–400 acres – we give them inputs, buy back at a fixed price, and market it. Farmers have a good, consistent price. Consumers get good produce. The kiosk is managed by college students who study in the morning and [in the] evening take care of the kiosk, so students have benefited. Since we started with sweet corn, now we are trying other produce in the same pipeline.

Shivaji Pandey: Different things we can do to make smallholders better entrepreneurs and businesspeople, I can

summarize in one sentence: Just make it easier for them to produce and sell, and get out of their way. The rest of it, they will take care of.

Smallholders think, plan, plant, harvest, eat – if there's a little left, they sell. And they do it under circumstances of labor shortage, input shortage, climate change, corrupt governments, no markets, very little support from anywhere. Many of us experts would not be able to make the kind of living those smallholders do, on less than two hectares of the land and under the circumstances they do. In spite of all that, they produce more than half of the world's food today. They are entrepreneurs. They wouldn't be doing that if they didn't have capacity.

Now that there will be more money going to agriculture – we still don't see a lot of it, but the expectation is it will be there – what can we tell the international community to do right this time? I would say, Invest in local institutions and people. For the last 25 years or so, there has been a serious decline in the capacity to take care of food-security issues in most developing countries, except, at maximum, three [countries]. So when you have \$1 million, look at it and say, "How much is going to those developing-country institutions and people, and



KAMAL EL-KHESHEN
Vice President, African Development Bank



RAJESH KUMAR
Farmer, Tamil Nadu, India



SHIVAJI PANDEY
*Director, Plant Production Division,
UN Food & Agriculture Organization*

how much is going to [our] institutional salary and benefits?" Not much of that is happening.

Kamal El-Kheshen: Agriculture remains, outside of oil- and mineral-exporting sectors, the largest economic sector in Africa, and a very important sector, particularly regarding food security. Our activities aim at ensuring food security and that there is enough surplus to be exported and increase the forex receipts of African countries. That has particularly been brought into focus when we saw the "3F crisis" over the last few years – the fuel, the food [and the financial] crisis. The smallholder, and other modes of production, are equally important for African agriculture. The support we give to the smallholder is to help him, or rather her, to commercialize and turn from subsistence to surplus, where [they] can market their products and receive financial revenue.

In that regard, we need to focus [on] micro-credit; markets; the capacities, at the smallholder level, at the mid-scale level, and at the government level, for policy formulation, for advocacy work, and for implementation. We also work in assisting

and supporting the farmers to cope with the changing environment, be it climate change, be it price uncertainties; and in that regard, again we are working with some other organizations like the World Food Programme, looking currently at crop insurance so that it takes the uncertainty out of the equation for farmers.

Fresco: The key issue to distinguish small farmers, although it is true for all farmers, is risk. Insurance has saved farmers in Northwestern Europe from many issues of volatility. Farmers cannot benefit from markets, from governments, from good contracts, if there is not a buffer for risk. Small farmers have as much risk appetite as any other type of farmer; they're no different [except for] the buffers.

El-Kheshen: In making credit available to smallholders, we support certain civil-society organizations and farmer groupings. In Mauritania we have a Small Entrepreneurs Loan Facility. We have a similar one in Tanzania and a few other countries. These also help them to set up agribusiness-support networks, to look at post-harvest losses, which is another priority area for us.

Fresco: And does this go directly to the farmers or does it pass through the government?

El-Kheshen: Well, we cannot work directly with a thousand farmers, but we attempt to cut the number of layers between us and the final beneficiary. We have very strict conditions and monitor the use of funds which will provide lines of credit aimed at SMEs, in particular in agriculture. We've launched an agriculture support fund which works uniquely, strictly with private-sector organizations, does not go through government or public-sector banks.

Pandey: Policies alone are not going to feed the world. There have to be technologies. Land per capita is going from 4.3 hectares in 1960s to 1.5 hectares in 2050; productivity growth rates of most of the cereals [are] going from 3.5% a year in the 1960s to 1% or less in 2050 – there is ever more need for better technologies to be produced and policies to support development and deployment of those technologies.

Governments and donor agencies' ignoring agriculture has had a tremendous

impact on research and education in developing countries. You can talk as much as you want about everything else; unless you address research capacity, you are not going to solve the problem. Today, less well-prepared people than the people of the '60s and '70s are conducting research in developing countries, and they are training new generations. We are going in that circle.

Kumar: In India, up until the last five or six years ago, we didn't have chain stores or supermarkets. Once the supermarkets started coming, we see a lot of difference for smallholders in producing their crops. The supermarket helped them with knowledge about what to produce, how to produce, and they buy it back from them. Farmers are very ready to associate with supermarkets. It has started in a small way, but India doesn't allow foreign direct investment in supermarket chains [and] we feel, if it's allowed, more improvements will take place amongst smallholders.

Gabre-Madhin: The spot market itself reduces significant amount of risk. Some farmers in the north of the country, selling sesame, were nervous that they could

deposit commodity in our warehouse, have it sold on the trading floor in Addis Ababa, and [have] a guaranteed payment the next day. They said, "This is impossible – it takes us months." So they brought the sesame and sold it, they saw the price that they sold it at on the screen, they heard it on the radio. The next morning the entire co-op, hundreds of them, went to that bank branch in this town to see if what we were saying was true. At 11:00 am, the manager walked in and asked for the balance, and it was there. I wish I could convey to you the emotion. People were crying, cheering, ululating, laughing, the works. They really can do business, they get paid, and they can plan to do other things with the capital. They don't have to hold off buying better tools, seeds, or whatever.

[Like] Louise's example of the women who put in money and are able to take it out in the ATM – essentially, our warehouse becomes a bank branch. If you put commodity in a warehouse, it is as good as putting money in the bank. You can pledge it and get money the next morning. Alongside that, we are building a three-month forward contract. Our government

is concerned that this quickly leads to excessive speculation, in itself a type of risk. So we're moving slowly, but we see the two things going hand in hand – the financing of the commodity in warehouse, alongside the forward contracting.

Ferroni: The panel seems to be convergent: Farmers will rise to the occasion if given half the chance, and that half the chance has everything to do with all of the settings, services, institutions, incentives and so on.

Risk has been a recurring theme. Our foundation has been able to develop over the last two years, together with UAP insurance company, a unique product. The Kilimo Salama insurance product – Swahili for "safe or protected agriculture" – insures farmers for their cash outlays and purchased inputs; currently, seed, fertilizer, and crop-protection products. The product is weather index-based. There are no farm visits, one of the reasons the premium is affordable for smallholders. It is distributed by agrodealers. And it operates on an advanced mobile platform to keep costs to the absolute, rock-bottom minimum. When you're talking about insurance for smallholder farmers, affordability is the alpha and the omega.

The agrodealer is given a camera phone and they scan a barcode that registers the input together with the insurance. The camera phone transmits the data to UAP – and a policy is created. A few seconds later the farmer receives on their cell phone an SMS about the policy. And since we now know their phone number, we can follow up throughout the growing season with agronomic messages and so on, a helpline, and a whole slew of supporting services. This is different from what's on the market now. It has been bought by something like 12,000 farmers in the current season.

Fresco: I'm so glad you mentioned a mobile phone. When Norm Borlaug said, "Take it to the farmer," he thought about seeds. But a lot more needs to be taken to the farmer – knowledge, extension, modern technology and financial products. There are still many people who are even beyond the minimum that we're talking about, where there is no mobile phone, no banking outlet, no market. When we talk about small farmers, [there] is this possibility, through them, to reach out to the have-nots. I'm very sure I speak in the spirit of Norm Borlaug, [who] wanted especially those very poor, very disadvantaged, who do not have those possibilities yet, to be reached through productivity increases of the small farmers. ■



UMA LELE
Senior Adviser (ret.), World Bank



JESSICA ADELMAN
Vice President, Syngenta



ROLF DERPSCH
Senior Expert (ret.), GTZ



JOE DEVRIES
Director, Program for Africa's Seed Systems

CONVERSATION

Overcoming Major Constraints Facing Smallholders

Uma Lele: One of the important reasons why the Green Revolution was so successful in Asia was that it wasn't only the seed and the fertilizers and all the ingredients that had to be put together in terms of policies and institutions and human capital and infrastructure, but the fact that, first of all, there were leaders that helped to mobilize the political will to bring the different ingredients of success together using an integrated approach.

I am going to urge our panel of experts to talk about things not just in the areas where they are experts, and what can be done in soils and water and seed, etc., but how to bring it all together. Because that is the big challenge that the development community faces.

Rolf Derpsch: When talking about overcoming constraints to productivity, we first need to analyze what are the core constraints that global agriculture and farmers, as well as soils, are facing. One of the core constraints is the degradation and sometimes irreversible destruction of soils, which has reached frightening proportions, obstructing the ability of producing more food.

According to FAO, almost all agricultural

soils show alarming signs of land degradation. More than 10 million hectares of agricultural land are lost each year to land degradation and desertification. The problem is especially severe in the developing countries of the tropics and the subtropics.

Intensive tilling destroys the biological and ecological integrity of the soil system so that productivity is significantly impaired. If soil erosion and degradation continue unchecked and production systems do not change, then it is most likely that soon we will not be able to meet our world food demands.

The available answer to soil degradation is called conservation agriculture, no-tillage. Conservation agriculture is based on three principles: permanent organic soil cover, no soil disturbance by tillage, and cropping diversity – that means crop rotation, use of green manure, cover crops, etc.

Higher water infiltration rates in the soil increase water use efficiency by crops, reduces the surging of rivers and dams and at the same time reduces the risk plodding. Conservation agriculture through no-tillage systems secures the carbon into the soil, increasing soil fertility as opposed to tillage systems that release CO2 into

the atmosphere and contribute to global warming. To stop ongoing worldwide degradation of agricultural soils, we need to transfer this soil-regenerating and soil-building system more intensively and more rapidly to farmers around the world.

Adoption of no-tillage systems has reversed the former trend of declining cropping activity and led to an economically, ecologically, and socially sustainable form of commercial cropping in South America. With the adoption of no-till farming, Brazil and Argentina have been able to double their grain production between 1999 and 2005 in a matter of only 15 years. As a result of applying this technology, soil erosion, soil degradation, and desertification have virtually been stopped in these countries. The system also preserves water, improves soil quality, and increases biodiversity. Therefore, it is considered to be the most sustainable production system available to farmers today.

Joe DeVries: Improved seed has really served as a foundation for Green Revolutions around the world. But so far, in Africa, most farmers have been deprived of this critical, game-changing technology — that is, the supply of professionally developed, improved crop varieties. The

situation is made all the more urgent because it's now a very achievable solution for increasing productivity.

The problem historically has been in two parts. On one hand you've had a lack of improved varieties of Africa's crops; on the other, you've had no means of getting the seed to farmers, even if you had those improved varieties. Through AGRA's support to approximately 70 breeding programs around Africa they have developed over 150 new varieties just over the past 3 years in the 13 countries where we work. Another 50 is expected to be released within the next quarter or two.

But more importantly, we also have a means now for getting them to farmers. The basic model is that of the private, independent seed company working in close collaboration with the research institutes to finally provide that bridge between research institutes, breeders and farmers. This is in response to policy changes that have taken place in Africa that have allowed free competition of private companies to provide seed, but also a number of other factors, including financial support and key technical assistance, much of which is coming from the United States and the developed world.

There is also the development of a new phenomenon, the agrodealer — the village-based shop where farmers can go and obtain seeds, fertilizer, other productivity-enhancing technologies, as well as planting and utilization advice. We're working now with about 50 seed companies, and all

of them report selling out all their stocks every year. We're working with about 9,000 agrodealers and they are getting the seed out to farmers further into the agricultural landscape than ever before.

Farmers are demanding improved seed; seed companies and dealers are taking it to them. We've gone to some quite innovative methods based on this grassroots supply of seed, including breaking the seed down into sizable chunks or packages that farmers can afford. Farmers are not asking to be recipients or target beneficiaries anymore in Africa. They're asking to be viable customers of an ongoing system that they can count on from year to year.

On average in the areas where AGRA is working, farmers who have accessed seed report average doubling of their yields. Data from a panel survey in western Kenya has shown that with a local variety and no fertilizer, farmers are getting about 838 kilograms per hectare. With a bit of fertilizer and that local variety, they can boost it up to 1200 kilos. But with improved seed and the fertilizer, average yields among these panels of farmers were almost two tons — and that's the beginning of a Green Revolution.

We've now reached, just through startup agrodealer companies, about 15,400 metric tons of certified, improved seed produced and sold to farmers this year. If you blend in a couple of the larger companies that are now benefiting from venture capital provided through AGRA, that number jumps to 25,000 metric tons.

So I think we've made a great start.

I'm hoping that other donors would get interested in this. We've been provided generous support by the Rockefeller Foundation, the Bill & Melinda Gates Foundation, DFID, and now the Howard Buffett Foundation.

But this is something that really is available. It's in modular form, and it can be rolled out across the African Continent. It's one way that we can succeed in taking it to the farmers today.

Nuhu Hatibu: How do we bring the three pillars — the NGO sector, private sector and government — together? The reason I'm talking about markets today is because of two experiences that happened to me.

The first one was when I was really driving rainwater-harvesting systems in Tanzania. And I went to the driest area in Central Tanzania, and I was talking to these farmers who were growing ground nuts, and I was trying to introduce rainwater harvesting to them. After half an hour of discussion with about 20 farmers, they asked me, "Then what? After we adopt your rainwater harvest, what is going to happen to us?" I said, "You're going to harvest more ground nuts." They said, "Then what happens?" I said, "Of course, you're going to be selling, making more money." They say, "Can you stop there and let us go?" So they took me to the village, to a house, and they opened the door. They said, "This is our ground nut from the season before last." And then they opened another one and they say, "These are our ground nuts from last season,"



STEPHANIE HANSON
Director of Policy and Outreach, One Acre Fund



NUHU HATIBU
CEO, Kilimo Trust



SARAH MUNALULA
Farmer, Mwumba, Zambia

and then they pointed to the ceiling and said, “These are our ground nuts from this season, and we have not yet adapted your rainwater harvesting. And so now what is going to happen to us, with three years of crop that has not been sold, if we adopt your rainwater harvesting? So, young man, go away. When you know how to sell this ground nut, then you can come back and talk to us about rainwater harvest.”

So that is what made me to change rapidly from being a hard-nosed agricultural engineer to a market specialist. Overnight, I taught myself about the value chains, and actually, after two years I was teaching my own courses on value chains in East Africa from an agricultural engineer promoting rainwater harvesting to that.

The second thing that happened to me was when I was writing a major IFAD program on water management and I went to Central Kenya, and I was trying to promote this program. I was talking to these farmers who were very well organized. They were growing green beans. They had developed a really good irrigation system. They were supplying water to each field in pipes with meters on each field so that they could control and apply water very, very efficiently, irrigating the plant instead of irrigating the soil.

And then when I told them about my program, they said, “You know what? Actually, we have a very efficient system, but we need more water. And we went to the government of Kenya and applied for more water, and we were told that we were going to be given more water as long as we do an environmental-impact assessment of

this forest catchment where they were going to get their water from. Now what we have done is that we’ve already collected our own money, and we are hiring an expert to do this environmental-impact assessment. The only thing you can give us is to supervise this expert we’re going to hire.”

So from these two experiences, I realized the importance of access to markets in all these things.

Dr. Borlaug’s last words and the theme of this dialogue are Take it to the farmer. And in this age and time, the smallholders of sub-Saharan Africa are saying, “Yes, but bring us genuine, transparent, and profitable markets, and we will do the rest by ourselves.” In other words: Don’t do good for us, but do business with us.

Jessica Adelman: There are approximately 450 million small farm units of up to 2 hectares in non-OECD countries. Assuming an average household of five, about one-third of the world’s population depends on small-scale farming for at least part of its livelihood. Smallholders produce a large share of the food consumed in both the developing and the developed worlds. Their ability to earn incomes from farming and in turn pay for inputs, consumer goods, and, in the best case, education also affects general development prospects, the nature of economic transformation, and the environmental footprint that they create.

We need to ask ourselves: Why are we embracing technological innovation in some sectors, but denying it to those that need it most? Why are we denying it to the business of giving people the opportunity to feed themselves? How can we help

farmers make farming a viable commercial enterprise?

The private sector can’t do it alone. It has to be a combined, unified effort of business, government, NGOs and academia, drawing on all of our knowledge and resources.

We all know that the only choice we have is to grow more with less. The economist, Indur Goklany, calculated that if the average yields of 1961 had prevailed in 1998, we would have to be using twice as much land to grow those yields on. If we extrapolate forward, growing twice as much food by 2050 without decimating our rain forests and habitat will require that we take advantage of all sides of that triangle.

For example, Syngenta and the Syngenta Foundation are involved in the Laikipia project near Mt. Kenya, which involves interweaving all the sides of the triangle that I spoke about — people, land, and technology. Our goal is to reach 30,000 smallholders farmers in the next three to five years, helping them to become viable commercial enterprises.

This involves a comprehensive training program, knowledge centers, and the help and advice of a team of trained agronomists. It also includes use of appropriate technologies, such as low-cost greenhouses, rainwater harvesting, and drip irrigation. Already, yields are up 50%. One farmer saw her potato crop increase from two bags per year to six, more than tripling her income. The extra \$125 she made that year was the difference between being on the edge of starvation, or opening her own bank account and buying more land.

Another example of technology and

knowledge in action is our crop advisory through a mobile pilot project that we just completed with Nokia in India. It provides growers with tips on pest and disease management, tailored to specific crops, all via their cell phones. Syngenta provides the vital capacity-building information in terms of crop advisory tips around pests and diseases. Now that’s progress.

Finally, let me make a comment about no-till. The benefits we’ve seen in the developed world are even more urgently needed in the developing world. In Ghana, for instance, farmers who have adopted no-till have increased their yields by 45% in maize, but no-till demands the application of modern crop-protection technologies. We can’t allow the lifestyle choice of low productivity organic farming that’s preferred by some in the wealthy nations to dictate the terms of, and hamper the development of, food security in those other areas of the world. And that’s a real challenge that we see all the time today, certainly in my business.

All of the projects I’ve mentioned involve alliances between private-sector companies and, more often than not, between the private-sector, NGOs, and governments — many times all of the above. Business alone may not be able to ensure the growth in food supply that we need in developing and underdeveloped countries. But farming is a business that must have a seat at the table. Not all of the solutions can be strictly market-based, but the strengths of the marketplace must be brought to bear. By bringing together solutions that connect people, technology, and land, we can replicate in agriculture the amazing

advances our world has made in other sectors.

Stephanie Hanson: I live in Western Kenya, the headquarters of One Acre Fund. We are a young organization started in 2006, and we were started to serve smallholders who lack access to finance. Traditional banks are not interested in doing agriculture lending. It’s a very expensive endeavor, it’s risky, and it’s very difficult. And microfinance organizations, surprisingly, in most part feel the same way. Microfinance has over 100 million clients worldwide now, and most of those clients are in urban and suburban areas. Microfinance really has not penetrated deep into rural areas, where most smallholder farmers live.

The One Acre Fund lending model works as follows: Instead of cash, we lend seed and fertilizer. So we are beneficiaries of the work that AGRA has done on developing seed companies in East Africa. We take certified seed and fertilizer, and we distribute it to a network of market points in Kenya and Rwanda, very deep in rural areas.

Farmers are receiving those inputs from us on credit, so over the course of the growing season, they repay it in cash, so we have a completely flexible repayment system. It’s completely, completely flexible to accommodate the irregular cash flows of the typical smallholder farmer.

Those repayments are collected by a network of field officers that function, essentially, as a combination loan officer and agriculture extension agent. Our field officers track germination rates in the field, and they’re with their farmers five to six

days a week, consulting them, listening to their concerns, and really helping them throughout that growing process. At harvest time they do a lot of training on post-harvest handling and storage, because post-harvest crop loss is a big problem for our farmers. And finally, at harvest time, if our farmers have surplus, our field officers assist with market access. So they will help farmers join together in a larger group and link those farmers with a local trader.

We have a repayment rate of 98%, so that’s 30,000 farmers with relatively limited income who are repaying their loans in full each season. And they’re seeing great results in the field. We are roughly doubling farm income per planted acre, and that’s in one growing season, so it makes a really big difference for a farmer with one acre of land who’s seeing that extra \$120 of income.

And finally, we believe that this lending model can be operationally sustainable. This year we’ll receive \$1.4 million in farmer loan revenue, and that will cover 65% of our field expenses. So, yes, agriculture lending can be expensive. But if you go out to the rural areas and really focus on serving your client, the farmer, it’s possible to do it in a sustainable way.

Sarah Munalula: I would like to express my problems as a farmer. We are facing a lot of problems in marketing, especially in maize. We’ve got only one institution that — this is a government institution, the Food Reserve Agency — that buys maize from farmers. Now, as you know, when there’s no competition, then there’s no demand. So if a lot of companies competing to buy the commodity, the prices rise. So we only rely on the Food Reserve Agency. I would appeal, if the private sector would come in and help us. There are farmers who also grow cotton, but this time as for cotton they are okay because there are about three companies that buy cotton, so they compete on prices. We, as farmers, we’ve got a problem as groups. I would like to appeal to the private sector if they could come and work with the government so that they can be giving us some loans on borrowing — they lend us some inputs and some funds so that we can do well in farming.

Otherwise, it’s a challenge to get peasant farmer — me, I’m a peasant farmer who only depends on conservation, and I don’t use any reaper. I depend on my back with my children. They help me in the farm, dig the holes. If I don’t have enough fertilizer, we go and look for cow dung, this animal manure, to apply into my field so that I can keep the family surviving. This is all about my story. ■

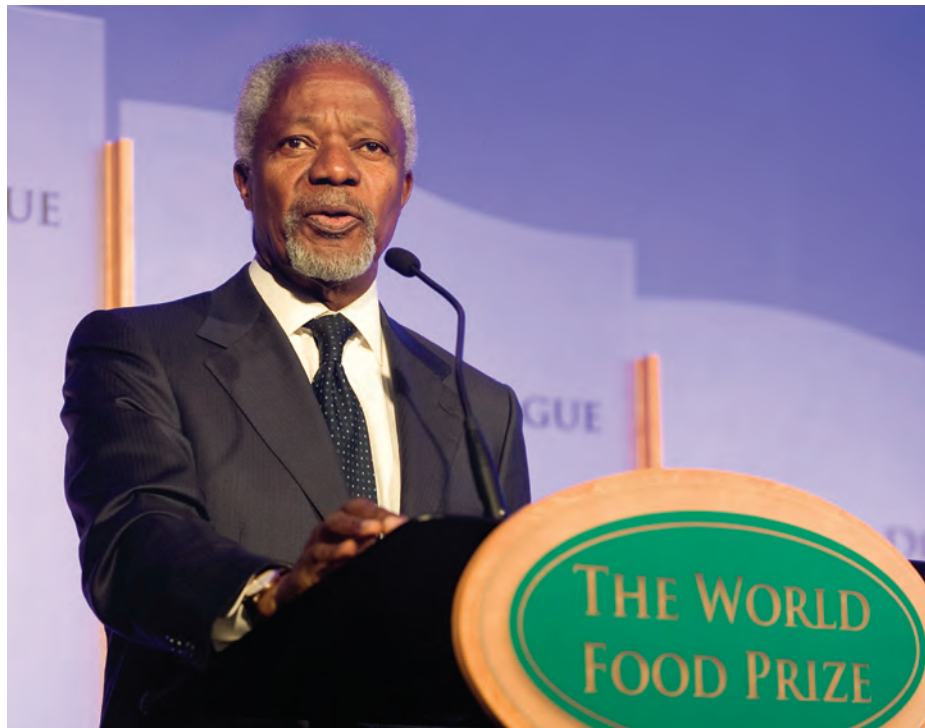


H.E. KOFI ANNAN

Former UN Secretary-General greets the future farmers of Sanankoroba in Mali.

“Although the proportion of people suffering from hunger is declining, the pace of progress remains unsatisfactory. Without coordinated and urgent action, the most basic goal of reducing poverty and world hunger is not likely to be met by 2015 in many countries. Achieving this ambition requires fundamental reform of economic and social policies across the planet.”

- H.E. Kofi Annan,
Chairman, Alliance for
a Green Revolution in
Africa



H.E. KOFI ANNAN
*Chairman, Alliance for a
 Green Revolution in Africa*

KEYNOTE

Speeding the Forces for Change to End Hunger in Africa

Today, one billion of our fellow human beings will go without sufficient food.

Although the proportion of people suffering from hunger is declining, the pace of progress remains unsatisfactory. Without coordinated and urgent action, the most basic goal of reducing poverty and world hunger is not likely to be met by 2015 in many countries.

Achieving this ambition requires fundamental reform of economic and social policies across the planet. Africa is the only continent which does not grow enough food to feed itself. It alone has failed in recent decades to see agricultural productivity keep pace with the growing population.

It is a challenge which can only be overcome by working in partnership with the continent's smallholder farmers – and of which three-quarters are women.

But while agriculture contributes one

third of the continent's GDP and provides most of its food, it has received minimum support. African governments in the final decades of the last century pulled back from desperately needed investments in agriculture at a time when the private sector and market forces were unable or unwilling to fill the void. Public expenditure in agriculture and agricultural research development for training farmers and supporting them was slashed.

The impact of these policies was made far worse by a dramatic downturn in overseas development assistance for agriculture by our rich partners.

The result was that the smallholder farmers struggled to access both the knowledge and resources needed to improve their crops and farms. Poor management of land, water resources, along with weak national and regional economic infrastructure links also held back agricultural development.

And African farmers also found themselves severely disadvantaged by an

unbalanced global trade regime which sets up barriers to potential export markets, prevents the development of food industries while allowing surpluses to be dumped on the continent.

It was to play my part in helping bring this transformation about that I was delighted to accept, on leaving the U.N., an invitation to chair a new organization, the Alliance for a Green Revolution in Africa.

Our aim is to help build the systems needed to strengthen the critical links in the entire value chain, to make smallholder farmers and smallholder farming productive, sustainable and profitable.

We are doing this by identifying, supporting and extending proven local solutions for the benefits of not just hundreds of farmers but thousands and eventually we hope millions. In particular, AGRA is starting to work with countries, donors, NGOs and farmers' organizations to develop and implement strategies in those areas with the greatest potential to

become Africa's breadbaskets.

What is also important is that African governments have themselves recognized the economic and social benefits of investing in their farmers and the rural economy. Seven years ago they adopted the Comprehensive Africa Agricultural Development Program. This called on African governments to put a minimum of 10% of their budgets, national budgets, into agriculture with the aim of achieving 6% growth per year.

And this African impetus, along with the commitment of the Millennium Development Goals, spurred a new drive by developed countries to support Africa's agricultural growth. Indeed, never before has there been such a collective drive for change. This encompasses civil society organizations, philanthropic foundations, and multinational corporations. It's an unprecedented coalition, and it's having an impact.

In Mali, farmers are growing new varieties of sorghum, maize, rice that are drought-tolerant and disease-resistant. They are using seeds developed through conventional breeding techniques that can be shipped and developed by African scientists and institutions. National agricultural research organizations, new seed companies and agrodealerships are all part of this transformation.

Farmers are also being trained in sustainable soil management techniques. By organizing themselves in farmers' organizations, smallholders are freeing themselves from their dependence on middlemen who can take up to 30% of the value of the farmer's crop.

These organizations are helping farmers improve access to storage, to information on market prices, and where necessary to credit so that they are not forced to sell their produce when the prices are low.

In Kenya, farmers have quadrupled production of maize and other crops by using lime to revitalize acidic soils. The local lime companies have donated the cost of transporting soil nutrients to the farmers. The Equity Bank in Kenya has made finance available at favorable rates to farmers. And the National Agricultural Research Institute is developing improved crop varieties and coordinating the entire effort.

This project's success could reverberate across much of East Africa and Central Africa, Southern Africa. In the southern highlands of Tanzania several hundred thousand smallholder farmers produced five million metric tons of maize in 2009 utilizing improved seeds and fertilizer,

distributed through the AGRA agrodealers program. Luckily, the World Bank has been so encouraged by the results that it is now providing \$160 million to scale up the initiative nationwide.

In Malawi greatly improved seeds and yields, because of access to affordable fertilizers, have led to the country becoming an exporter of maize for the last four years.

We are seeing as well the World Food Programme working to expand access by sourcing more and more of its food aid in Africa from local farmers.

improved seeds and fertilizers.

We are only at the start of a very long and grueling journey but fundamental change is now within our grasp. The challenge remains immense. Many millions are still going hungry. Populations continue to grow. Climate change is almost by the day adding to the pressures on Africa's land.

But I remain optimistic, optimistic about Africa's chances to turn the corner once and for all. And I think with the partnership that we have established and the energy that we are bringing to this issue, we can do

But if we stand together — governments, civil society, the private sector, the scientists, and the farmers — and sustain our efforts, I assure you a unique African Green Revolution is within our grasp.

One of the programs through regular trading partners, for example, is a group of women farmers in Kenya. Through the World Food Programme, Bread for the World, HIFI International, and many other actors, the central role that women farmers play is finally being recognized. But we must do more to help them by removing the barriers in their way.

Women who produce most of Africa's food are particularly disadvantaged economically and socially. They are not considered heads of households. Rarely do they have titles to land, and their interests are all too often overlooked by traditional financial institutions. We need practical measures from field to market to remove these obstacles so they have a voice and a stake right through the agricultural value chain.

But it is not only women farmers who have found it difficult in the past to access investment. Despite the huge importance of agriculture to Africa's economies, the continent's commercial banks typically extend less than 3% of their lending to that sector. We have to put this right. Agriculture is a business and must be financed as such.

Investment in and support for agrodealer networks are building thousands of rural businesses across the continent and ensuring that the inputs are available to the farmers. These investments are helping millions of farmers in remote areas gain access to basic ingredients and are leading to the success we have seen through increased yields of

it. And if we miss this opportunity, I don't know when we are going to get another one.

Without a prosperous, stable and peaceful Africa, our ambitions for our world will not succeed. We need African government to stand by and support their farmers through resource allocation and through right policies, right economic policies that also are environmental sensitive and is pro-poor and pro-rural communities.

This is not a simple matter of big farms or small ones. Indeed, when done responsibly, large-scale systems can play an important role in directly supporting small farmers through technical advice and support and access to markets. However, care must always be taken to ensure that local communities are consulted, and the rights to land and natural resources are also protected.

But if we stand together — governments, civil society, the private sector, the scientists, and the farmers — and sustain our efforts, I assure you a unique African Green Revolution is within our grasp. It will be a huge step forward, banishing hunger and meeting our ambitions for a just and peaceful world. The hope is that World Food Day will not in the future be a rebuke for the one billion people who don't have enough to eat but a celebration, a celebration of a food and nutrition secure world. ■



“I’m very proud to be a small, rural farmer. That’s how you begin to grow as a person. Sometimes we think we need big pieces of land to produce enough food to feed. We can produce enough on small parcels of land. The key is to learn how to maximize the small-person land to produce more and to do what’s good for us.”

- Guilmer Miguel Montufar, Farmer, Honduras

GUILMER MIGUEL MONTUFAR
Farmer, Nueva Frontera, Honduras



M.S. SWAMINATHAN
Chair, M.S. Swaminathan Research Foundation



CHRISTIAN BORGEMEISTER
Director General, icipe



CHRISTOPHER FLAVIN
President, Worldwatch Institute

CONVERSATION

Smallholder Agriculture and Biodiversity

M.S. Swaminathan: As an agricultural scientist and a world leader, Norman Borlaug recognized the importance of genetic diversity. In fact, all the success of his work was based upon a fundamental principle — genetic homogeneity enhances genetic vulnerability to pests and diseases.

Farmers have always valued diversity; they are the great conservers. In the broad world of biodiversity, agrodiversity is the product of interaction.

With the onset of climate change, agrodiversity is now being recognized. The climate-resilient agriculture has to be built on the foundation of biodiversity. In the case of small farmers, most of the great conservers have been women.

Similarly, small farmers have always considered biodiversity to be crucial in sustainable agriculture. We need to

revitalize this kind of conservation to promote a climate-resilient agriculture.

There is no use in saying small farmers are the custodians of genetic diversity without also recognizing and rewarding them. This is why both the Global Biodiversity Convention and the FAO Treaty on Farmers' Rights have specifically made suggestions as to how people should recognize and reward the conservation traditions of local small farming communities.

In India we have a Genome Saving Award for farm families and communities who have been able to conserve landraces. One of the places I work is a biodiversity hotspot. The women there decided to form a society translated as the "Biohappiness Society." The purpose of the biohappiness society is to ensure the conservation, sustainable use and equitable sharing of the benefits of biodiversity.

Christian Borgemeister: Applied

biodiversity by small-scale farmers in the tropics is basically their strategy to deal with risks of crop failure due to pests, diseases and climate, among others.

Contemporary agriculture in the developed world is more focused on monocultures. While this creates economies of scale, it also increases the risks of erratic events. One of the reasons for this is loss of genetic diversity.

More diverse agroecosystems are less susceptible to these external shocks. Yet the underlying mechanisms are still rather poorly understood.

About 15 years ago we embarked on a program which tried to use increased biodiversity in a cropping system to address a couple of the major factors affecting small-scale farmers in Africa: lepidopteran stem borers and parasitic weeds like striga.

This system consists of several crops planted together. The cereal crop, maize, is

accompanied by two companion perennial plants, a legume called desmodium and a napier grass. Both of them are very suitable fodder crops for livestock.

Now, we recently included beans into the system because they provide protein for both humans and animals. Intercropping maize with beans and other cereals is a very common practice around the Great Lake Region in Eastern and Central Africa.

The system is called push-pull for several reasons. The napier grass, which is highly attractive to stem borers, is planted around the plot and acts as a trap crop. The moths are "pulled" in by the smell that emanates from the napier grass.

On the contrary, stem borers are repulsed or "pushed" away by the smell of desmodium. Since desmodium is a legume, it also enriches the soil with nitrogen.

The desmodium plant also releases chemicals in its root system with herbicidal effects on striga, so you can completely suppress the striga weed when growing maize or other cereals in a push/pull system.

This system is a platform technology because it also works extremely well with rice, sorghum and millet.

Because of the improved nutrient content of the soil, you have greatly increased yields. On average we see a tripling of the yields, in some cases five to sevenfold higher yields in this context along with better water utilization. After 15 years we have approximately 30,000 to 35,000 farmers using this system in the Lake Victoria region.

Increased biodiversity in an agroecosystem are linked to the greater resilience and greater stability of these agroecosystems. They buffer better disruptive elements or disruptive events, like pests, diseases and climate change.

Christopher Flavin: The largest threat both to agriculture and biodiversity in this century is the rapid climate change that is already unfolding, and agriculture is very much at risk in many parts of the world. Particularly, areas closer to the equator face the prospect of conditions changing so rapidly that farmers will be forced not only to invest very heavily but adopt new practices in order to be able to sustain production.

We need to anticipate to the degree possible the climate change that's coming

and begin making the adaptations in agricultural techniques.

It is going to be very important that agriculture also recognize its responsibility for a portion of the climate change and recognize that there is much that we can do in agricultural systems that will slow the production of greenhouse gases.

Roughly 30% of the greenhouse gases that are being emitted annually actually come from a combination of agriculture and forestry.

We have been working with partners to research, understand and spread some of the innovative practices that will allow carbon sequestration in soils to become a significant reality and to actually be rewarded through carbon.

Agriculture also becomes vulnerable to a very chaotic and dangerous oil market due to its dependence on fossil fuels in production. Reducing this dependence will not only increase food security but will also contribute to reducing emissions.

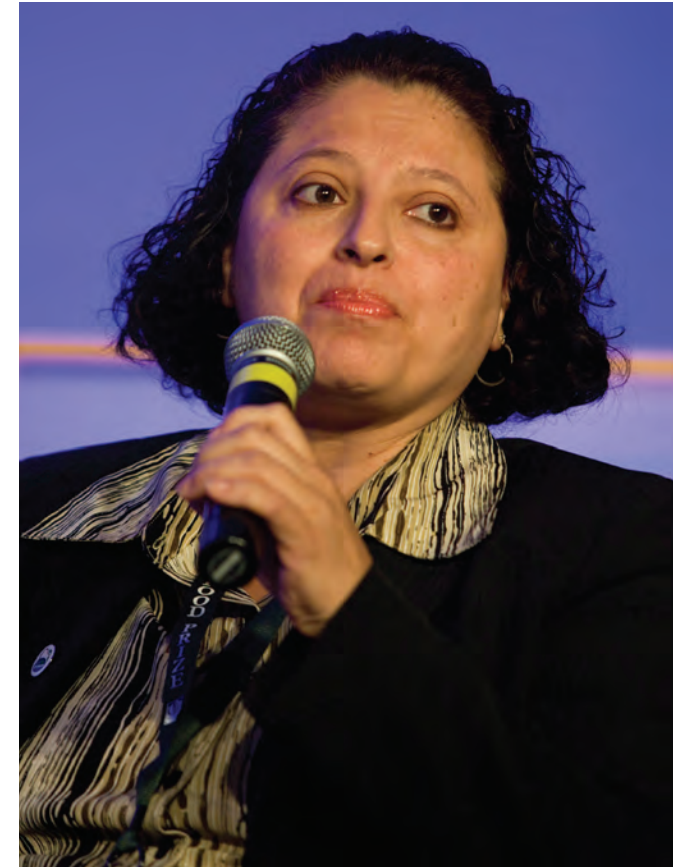
We should not only view this as a huge challenge but more importantly a huge opportunity for farmers throughout the world.



DENNIS GARRITY
*Director General,
World Agroforestry Center*



GUILMER MIGUEL MONTUFAR
Farmer, Nueva Frontera, Honduras



SUYAPA UCLES SALINAS
*Program Coordinator, Mennonite
Social Action Commission, Honduras*

Dennis Garrity: Biodiversity decline around the world has further accelerated in the past decade. The majority of those declines have been due to habitat conversion for farming.

It has slowly dawned on the conservation community that smallholder farmers have a lot to do with conservation of biodiversity and that local biodiversity is also crucial to smallholders' livelihoods as well.

Today there is greater than 10% tree cover on half of the agricultural land in the world. And in some regions, such as Southeast Asia and Central America, tree cover on agricultural land actually exceeds 30%.

Smallholder farmers in the tropics have always husbanded trees on their farms and continue to culture them for a great variety of purposes.

We call this "evergreen agriculture," a form of more intensive farming that integrates trees with annual crops. Evergreen farming systems feature both perennial and annual species that are producing food and income.

In the food basket zone of Tanzania, trees

intercropped with maize are dramatically enhancing the yields of crops due to their striking effects on soil fertility. Trees are nitrogen-fixing, and act as fertilizer factories in the field, providing tons of nutrient-rich biomass year after year with no investment costs to the farmer.

These trees are fully compatible with the crops because they exhibit a unique physiological trait, reverse phenology. This trait triggers this particular species of trees to go dormant at the beginning of the crop season when the rains occur and drop their biomass as fertilizer to the crops growing in their vicinity.

For crops like maize, sorghum, millets and other cereals, agroforests also increase drought resilience in dry years due to positive soil moisture regimes and a better microclimate. They also become a rich source of livestock fodder through their leaves and pods.

These systems also increase carbon sequestration above and below ground by an order of magnitude greater than in

conventional conservation agriculture.

These systems are currently practiced by millions of African farmers today. Farmers have identified and deployed these unique biological tools. The tools are already proven, and they are amenable to much larger deployment on a wide range of farming systems. We can now build on the tree genetic diversity that farmers have identified and nurtured, combined with the best of modern agricultural science and practice. They are not incompatible; they are fully synergistic.

Fortunately, more than a dozen countries in Africa are now working on evergreen agriculture scaling-up programs and many development partners, such as NEPAD, AGRA, IFAD and others are taking an active interest in supporting this vision. By collaborating with farmers we are now creating the vibrant partnerships necessary to realize an evergreen Africa and elsewhere in the tropics.

Guilmer Miguel Montufar: We recognize the importance of the farming

family. I'm the father of six children, three boys and three girls.

We started the sustainable farm with the idea to produce without harming the local resources. We say no to slash-and-burn techniques. We apply natural insecticides and herbicides made from natural plants and animals.

In soil preparation, it's important to apply terrace farming. It's also very important to have different types of crops growing at the same time on the same piece of land.

We're a very small farm, about two acres. On the farm we plant vegetables, such as radish and cabbage, banana, beans. We also have papaya and citrus trees.

Another interesting thing is that we also raise rabbits and chickens. We have received a cow for Passing the Gift from Heifer and appreciate all the technical support we receive from the local NGO and CAS.

We have a horse that helps us produce organic compost. We also have an earthworm farm where we grow our own compost. We have a bio-digester that

produces cooking gas from the manure of small animals. We know we need to use less firewood because we need to protect our environment and protect the forests as well.

We always work together as a family. They are still working and sustaining the small farm while I'm here since we don't have any other income or salary.

It is a priority to grow crops without harming the soil and without harming mother earth.

I'm very proud to be a small, rural farmer. That's how you begin to grow as a person. Sometimes we think we need big pieces of land to produce enough food to feed. We can produce enough on small parcels of land. The key is to learn how to maximize the small-person land to produce more and to do what's good for us.

Suyapa Ucles Salinas: There's some very big differences in what we think of as small, rural farmers in Central America and Latin America and what a small farmer might be here in the United States or Europe. One of those differences is the access to land that

our small farmers have, access to be able to produce.

The majority of the farmers we work with have less than two acres each, and the majority of times the land is not their own land. Many times they just rent the land so they can grow basic grains, to be able just to eat what they produce for them and their family.

Another difference we can see obviously is technology. In the rural area, there's not much technology. Another thing we can talk about is access to credit to produce. It is very difficult for small farmers to access any kind of loans.

It is very important to discuss also the human development, the dreams that people have, which also are tied to our culture. Generally in our culture we have a very low, low self-esteem in the rural area. So it's very important to work very much in the self-esteem of people to be able to have great success.

Another important thing to discuss too is the level of education that the small farmers have. There's a high rate of illiteracy in the rural area where we work and low levels of access to schools as well. This makes it difficult to train people to teach new ideas with the rural population.

Our region is also vulnerable for natural disasters in Central America.

You can see we have many challenges for the national and local NGOs that are helping small farmers. It is very important to talk openly about different context and different cultures at these types of conferences. It is very important to develop processes to be able to improve the lives and to improve crops and to improve yields as well.

All the stakeholders in this system share responsibility in dealing with these issues. And of course the small rural farmers have their role as well. In our country, and across Central America, land access is a challenge because most of the lands are reserved for forests.

So our role as local organizations is working on training people and capacity building and producing while protecting the environment. It's very important to strengthen the capacity of the small farmers in advocacy and action, as well, in the local agendas, government agendas and also international agendas and the problems we're facing.

We also need to talk about human development as we're talking about training farmers on how to work together, how to improve their capacities and how to improve their self-esteem. ■



SIR GORDON CONWAY
Professor, Imperial College London

PRESENTATION

Smallholders in a Changing Climate

I want to talk about climate change, but I want to root it in the needs and desires of smallholders in Africa.

Agriculture, forestry and land use generate over 30% of greenhouse gases. There are still big unknowns about climate change. There are three great drivers of climate in the tropics - in the tropical convergent zones, the monsoons and the La Niña/El Niño oscillation.

The inter-tropical convergence zone, by nature moving further north and further south each year, is bringing less rain to the north and south of Africa. There's also the great Asian monsoon, which creates the rainfall in Eastern Africa. Finally, there's the La Niña/El Niño oscillation. During the La Niña years the water in the Pacific effectively flows from the east to the west, bringing rainfall to Southeast Asia. And in the El Niño years it does the reverse and leaves Southeast Asia and Australia and elsewhere with considerable drought.

What we know is that there are a greater frequency of El Niño years since the 1970s; but we don't know whether that's caused by climate change, and we don't know whether

it's going to persist. And we don't know what is the interaction between El Niño/La Niña, the Asia monsoons and the inter-tropical convergent zone.

We also don't know where we're going to end up. We are aiming through all these negotiations that have been going on and all this commitment to climate change to hit a target of two degrees centigrade above preindustrial; we're about .07 now. But actually we're on track for four degrees.

Of course, there's a lot of argument about climate change going on, but for smallholder farmers in Africa and Asia, it's actually happening and they know it.

In the Atlas Mountains of Morocco the villagers now can't grow enough barley to feed themselves. They're testing drip irrigation as a possibility to grow high-value crops that they can sell in the markets on the coast of Morocco.

But what is interesting is that they're beginning to harvest quite seriously some of the wild plants around. The trees, the argan tree that produces a beautiful oil like an olive oil, and the honey from euphorbia. The challenge of course is that the women

are harvesting these, but they're not getting much for it, and the challenge is to convert this into the oils and the honey in situ and get some of the value added there. In general, women and men in developing countries are very good at analyzing their situation. There's a woman in India who is mapping out the changes that are going on around her. She's illiterate, barely numerate, but climate change is a reality.

I first began to understand this when I was in Ethiopia in Welo Province in the 1980s. I sat down with a couple of farmers and I asked them how many days of rain there had been for the previous one to six years. And after two hours they could tell me how many days there had been per month over those six years. I won't describe how they did it — it was phenomenal.

Another example is in the village of Nwadhajane in Southern Mozambique, the birthplace of the great Mozambique leader, Eduardo Mondlane. They are suffering from climate change, and they know it. They have two kinds of land —highland and lowland. In the lowland the crops grow well, but they get washed out with floods.

In the highlands they get good crops in the flood years but not so good in the last.

In response, they've created farmer associations so that each farmer gets a bit of highland and a bit of lowland. These associations are also doing experiments with drought-resistant crops. So farmers throughout Africa are experimenting with how to adapt to climate change, in some

“Of course, there's a lot of argument about climate change going on, but for smallholder farmers in Africa and Asia, it's actually happening and they know it.”

cases without site support but in most cases because that's just what they have to do. Simply put, much of Africa is going to suffer from greater heat, from greater drought and that will affect the agriculture.

And so the challenge is how do we deal with drought? We can breed new varieties, create new farming systems, or look for water on a sustainable basis.

The challenge is that we're moving from one ecological niche to another, so we have to breed new varieties to replace the existing varieties that are adapted from one environment to the next. In particular, we need indigenous crop biodiversity. There are, of course, great repositories all around the world of the varieties of crops that we have in existence, especially the great central repository in Szabadi beyond the Arctic Circle.

The International Treaty on Plant Genetic Resources has now set up a special fund help local communities analyze their own diversity and to look for new genes. For example, Peruvian potato growers are looking in local varieties for resistance to potato blight and drought.

Water is another area of focus. Some brilliant research has been done on deep-water rice. We now know that the “snorkel” gene allows rice to elongate if it gets flooded. They've also discovered the “sub” gene for submergence, which allows rice to survive underwater for a short time. We're trying to get all those genes into high-yielding rice varieties and maybe even combine them

together so a plant could decide whether it's going to switch on one or another.

In some situations these changes may be beneficial. In Northern China the minimum temperatures are going up so people can grow winter wheat, and the winter wheat in China is moving further north. But I don't think those beneficial situations are going to be very common.

In addition to these stresses, we're also going to get extreme events with greater frequency and intensity. It's because of these extreme events, such as Pakistan's floods and Russia's droughts and extreme heat. Those two phenomena are linked. They're caused by the same climatic effect whereby the jet stream remained stagnant, and everything above the jet stream got hotter and hotter. Below the jet stream everything got wetter and wetter. That's the first example of two really big extreme events being linked together as a climate phenomenon.

And how do you deal with extreme events? Well, you conserve diversity on your farm.

But there's also the issue of agriculture being a creator of greenhouse gases. For the worry about carbon footprints, remember that the big culprit is agriculture. It's partly because of carbon dioxide from deforestation and the loss of soil carbon. It's partly methane from flooded rice and enteric fermentation in cattle, and it's partly nitrous oxide from microbial

But the question is — what about the smallholders in developing countries? 70% of all greenhouse gas and 70% of the mitigation potential come from developing countries, and 90% of that potential is carbon sequestration. So collectively smallholders in these countries could make a huge difference, but why should they and how? That is the big problem.

One possibility, of course, is that they cultivate utilizing a win-win situation. Conservation farming is a good example. Minimal or no-tilling techniques will not only give these smallholders a better living but also will sequester some carbon. According to Dennis Garrity of UNEP it's about 0.1 to 0.2 tons of carbon per hectare per year.

The way forward is to look at what the successful REDD program is doing. They are Reducing Emissions from Deforestation and Forest Degradation.

Agriculture has somehow got to get on board. We need to look at that REDD program and find ways in which we can compensate farmers for making a difference. It's not easy to measure the carbon in the field or monitor it on a large scale, and we don't know yet where we will get the funding for compensation.

There's an alliance of people working on greenhouse gases, which has just started. The underlying partnership that we need to work on is combining the science and

“The underlying partnership that we need to work on is combining the science and technology of the north with the knowledge and innovation of smallholders of the south.”

transformation of nitrogen in the soil and in manures.

The amounts of methane and nitrous oxide are relative small, but they're the ones that have the biggest effect on global warming. You can reduce nitrous oxide and methane by various means, but the big challenge is how to get the carbon back into the soil. Rattan Lal estimates that if we put all the carbon back into the soil that agriculture has taken out since the second World War, it's equivalent to a hundred parts per million of carbon dioxide — that's a huge amount. It will prevent us from getting to four degrees.

technology of the north with the knowledge and innovation of smallholders of the south. We desperately need the partnership between very modern, difficult science and intricate, detailed knowledge by the farmer on the ground. It's a partnership that can really flourish. If we do that, we might just about avoid situations such as the food riots in Mozambique earlier this year. The price of bread went up 30% and 10 people died on the streets. If we go up 4 degrees, that's what's going to happen all the time. If we can get ourselves to less than 2 degrees, then there's a future for this son of the Peruvian potato growers. ■



JEFF RAIKES SPEAKS WITH STUDENTS FROM THE WORLD FOOD PRIZE GLOBAL YOUTH INSTITUTE.



JEFF RAIKES
CEO, the Bill & Melinda Gates Foundation

SYMPOSIUM LUNCHEON KEYNOTE

Progress in Agricultural Development

I grew up working on our family farm in Ashland, Nebraska. My father would speak passionately about his belief that American agriculture could feed the world, and I reflect on his vision fondly. I know if he were alive today, he'd see that the real opportunity to feed the world comes from supporting the productivity of farmers, family farmers, smallholders everywhere in the world.

When I became CEO of the Gates Foundation, I set up a meeting with Dr. Borlaug. He talked about one thing: wheat stem rust. He wanted to make sure that I knew that that disease was coming back, and he wanted to know what we were going to do to stop it.

I think about that day quite often and reflect on the fact that if a man who spurred the Green Revolution that fed a billion people was still vigilant well into his nineties, then there's just no excuse for complacency. Dr. Borlaug's spirit, his sense of urgency, and his moral commitment to small farmers, pervade the entire global agricultural development community.

Investment in small farmers has an

amazing ripple effect. What you do is not just about alleviating hunger and poverty. It's not just about preventing stunting and wasting. It is about helping people make their dreams come true.

Three-quarters of the poorest people in the world rely on farming for their food and income. If the goal is to help the poorest people get enough to eat and increase their incomes, then clearly, agriculture and prosperity must grow together.

Agricultural development has immense potential. But as Dr. Borlaug once said, "You can't eat potential." And I'm happy to be able to say that, because of the work that you're doing, we're starting to see progress for small farmers. I would like to spend a little bit of time providing evidence in support of my optimism.

The first piece of evidence comes from our own experience. When we started our agricultural development program, we announced a package of six grants spanning the agricultural food value chain. They totaled just over \$300 million, and they were designed to help over 5 million poor farming families in sub-Saharan Africa and

South Asia improve their lives.

Two years in, these grants are having a direct impact on hundreds of thousands of farm families and are on track to reach their goals. And I want to give you just one example.

We gave a grant to the International Rice Research Institute to develop a variety of rice that can tolerate submergence, so that rice farmers aren't wiped out by floods. By the end of this year more than 400,000 farmers will be planting this variety, and by 2017 we project that 20 million farmers will benefit from it — and that is tangible progress.

The second piece of evidence is the pace of research and development in agriculture. We are enthusiastic about the potential of science and technology to help small farmers. As Bill Gates told this audience last year, we need higher yields on the same land in harsher weather, and we will never get it without a continuous and urgent, science-based search to increase productivity.

While most of our grants support conventional breeding, in certain instances we do include biotechnology approaches

because we believe they can help farmers confront drought, flooding, disease or pests more effectively than conventional breeding alone.

But we don't think high technology is the only answer. Some of the most promising technologies of recent years are ingenious because they are so simple.

My favorite example of that is a triple-layer bag for protecting cowpeas from pests. It was developed at Purdue University in 2007. It costs just \$2, and it can increase cowpea farmers' income by about \$150 per year. That is tangible progress.

The third piece of evidence is that investments in agriculture are going up. A new report by the Partnership to Cut Hunger and Poverty in Africa found that U.S. agricultural development assistance to sub-Saharan Africa has grown significantly in recent years, from just over \$650 million in 2005 to now over \$1.5 billion in the last year.

Donor countries are following the example of African governments when they invest in agriculture. In 2003 the African Union adopted the Comprehensive Africa Agriculture Development Program, or CAADP. CAADP called on African governments to do two things: dedicate 10% of their national budgets to agriculture, and seek 6% annual agricultural growth. And now we see that 20 countries have signed CAADP compacts, launching solid plans to achieve these goals. Ten countries have

“Investment in small farmers has an amazing ripple effect. What you do is not just about alleviating hunger and poverty... It is about helping people make their dreams come true.”

exceeded the 6% agricultural growth target. That is tangible progress.

The fourth piece of evidence are the macro statistics on poverty and hunger. In Ghana, cassava production in that country has increased fivefold over the last 20 years. Tomato production has increased sixfold. And the cocoa sector has rebounded to become a crucial part of the economy again. In that time Ghana has cut hunger by 75%.

Of course, Ghana's story is extraordinary, but the global story is pretty good too.

Since 1990, 1.3 billion people worldwide have lifted themselves out of poverty. That growth is taking place in China and India but also in Africa where a dozen countries are on track to meet the Millennium Development Goal on poverty reduction. That is tangible progress.

The economic crisis is putting enormous pressure on budgets in both donor and developing countries — right at the time when we are showing a new enthusiasm

will allow farmers to get 30% more maize yield in a drought.

A second reason is this project is directly targeted at small farmers. It is only by working closely with farmers that we can understand the problems that need solving and to buy solutions that are likely to find traction.

In Malawi the government introduced various improved maize varieties for farmers to test in their fields. Of these

“Climate change is another very different and serious challenge. The places that will suffer the most severe weather and environmental changes are the same places where the poorest farmers live. Their very survival will depend on the ability to adapt to climate change.”

about agriculture. The G-20 countries, as I mentioned, pledged \$22 billion. That was their pledge last year for the years ahead, but this year it looks unlikely that they're going to meet their pledges. And we need to use our voice to get them, to encourage them, to meet their pledges.

Earlier this year the Global Food Security Trust Fund was launched. Right now there are 22 countries with almost \$1 billion worth of requests into the Trust Fund, but there's only about \$130 million that is now available. There are proven ways to do it well, but there is a real danger that we won't get it done.

Climate change is another very different and serious challenge. The places that will suffer the most severe weather and environmental changes are the same places where the poorest farmers live. Their very survival will depend on the ability to adapt to climate change.

Water scarcity is a related problem in large parts of the world. Rivers in China are drying up. Groundwater levels in India are dropping rapidly, and yet because of rapid population growth, urbanization and changing diets, the global demand for water is on pace to double in just 50 years.

So why do I say the drought-tolerant maize project is representative of where the community needs to go? Well, it's about innovation. One of the biggest challenges facing a small farmer in Africa right now is climate change. They can't change the weather or where they live. But this project can help them thrive on their own land. The new drought-tolerant maize varieties

the farmers preferred an early-maturing drought-tolerant variety over others. Malawi's Ministry of Agriculture took note, and endorsed the variety preferred by the farmers, encouraging thousands of farmers to use it in the country's most drought-prone areas.

Now, the third reason this project captures the direction our community is going is because it's based on massive partnership. Especially in tough economic times, we need to coordinate as never before to get the most out of our combined investments. This effort to develop drought-tolerant maize is building on more than two decades of research and involves a broad coalition of partners. The new institutional model at CGIAR to help coordinate its research efforts is a great example of how we can stretch our resources by reforming, modifying and evolving the way we work.

So I'm inspired by the optimism of farmer Sharifa Numbi. She said, "Through our hard work in the fields, we can eradicate poverty." She's right. Agriculture is the best lever we have to pull in the fight against hunger and poverty.

What's required of us is our unflinching commitment to the cause of agricultural development. It's the same commitment that drives Sharifa Numbi and millions of other farmers in the developing world do their part to feed the world. Progress against hunger and poverty is not only possible, it's happening, thanks to all of you. ■



“A strong agricultural sector is indeed critical to the long-term success of any nation. Promoting sustainable development of the agricultural sector helps to create jobs and incomes, helps to have families prosper, ensures food stability, and provides a better quality of life for all of a nation’s citizens.”

- Hon. Tom Vilsack, U.S. Secretary of Agriculture

SECRETARY’S ROUNDTABLE

Left to Right: H.E. Mohammad Rabimi, Minister of Agriculture, Afghanistan; Hon. Tom Vilsack, Secretary of Agriculture, United States; H. E. Nazar Gondal, Minister of Agriculture, Pakistan



HON. TOM VILSACK
Secretary of Agriculture, United States

THE SECRETARY'S ROUNDTABLE

Tom Vilsack: I'm certainly pleased to have this opportunity to discuss briefly the work of our three nations that has started to ensure food security and to promote more productive agricultural economies in both Afghanistan and Pakistan.

This trilateral partnership began in May of 2009 when President Obama invited the presidents of Pakistan and Afghanistan to Washington, D.C., for what was then an historic trilateral meeting. That made two unusual things occur.

First, because of all three presidents' belief that peace and stability can be best promoted through an all-out government effort, the three leaders agreed that our government officials should form partnerships at many and distinct levels. And as a result, Afghanistan and Pakistan brought delegations that included cabinet members and ministers to Washington to discuss how we could best work together towards common goals.

The second thing that happened was that there was a unique and fundamental recognition that a conversation around

agriculture needed to be front and center of any discussion. Folks agreed that a thriving and more productive and robust agricultural sector would serve as a foundation for a strong economy in Afghanistan and Pakistan and would allow us to work together to drive political and social stability.

But for this audience it probably goes without saying — a strong agricultural sector is indeed critical to the long-term success of any nation. Promoting sustainable development of the agricultural sector helps to create jobs and incomes, helps to have families prosper, ensures food stability, and provides a better quality of life for all of a nation's citizens.

This is particularly true for the nations that are highlighted today here, where so much of the workforce is involved in farming. More than 80% of the people who live in Afghanistan have their livelihood connected in one form or another to agriculture. In Pakistan a substantial portion of their rural population, which represents two thirds of their overall population, is also directly connected to agriculture.

So at our first meeting, which occurred last May, Ministers Rahimi and Gondal and I worked together to identify three key areas for increased agricultural productivity in their nations in this trilateral discussion. We wanted to work towards collaborative efforts, towards food security. We wanted to promote agricultural trade corridors between their two countries, and we wanted to look for ways to improve the availability of water for irrigation.

Since then, the cooperation between our governments and some internal participants from universities, nonprofits and private organizations has extended down into a technical level, with each nation creating a working group to focus on these priority issues. These groups have worked together over many months and have even come together twice in person.

Their consultations have focused on finding concrete and creative strategies for long-term sustainability of the agricultural economies of both countries. The group focused on trade corridors and working to build on what will soon be an Afghanistan-Pakistan transit trade agreement, which

“I believe that Pakistan and Afghanistan are now on the right track towards better water management, mutual food security, trade, economic growth, and lasting peace.”

will allow goods to pass from one country to another.

Most immediately, the group is developing and designing a curriculum of training courses focused on these export opportunities with specific pilot crops, like kino, a citrus similar to a tangerine, and grapes.

The teams also focused on food security as they looked at long-term plans to build the capacity for surveillance and detection of both animal and plant diseases. For example, an existing wheat disease surveillance system in Pakistan has served as a starting point for us to strengthen and be brought across the border to Afghanistan.

And the group is beginning to design a curriculum for extension workers on a wide variety of topics, including post-harvest handling and markets, seed handling and rangeland management.

And the working groups have focused on irrigation, not only irrigation systems but also on rehabilitating watersheds to increase the overall availability of water for agriculture.

The Afghanistan working group consulted for many months in which Pakistani and American counterparts designed an irrigation training institute which will be open to both Afghans and Pakistanis. And the team is nearing the final phase on design of four demonstration projects.

Finally, these meetings have worked towards finalizing detailed action plans for both nations, which recognize the differences between Pakistan and Afghanistan in terms of their needs and in terms of the priorities for their individual country's agricultural development.

While much of this work awaits final approval, I'm pleased to note the progress that has been made. To be truly successful

in building long-term strategies that result in sustainable growth for agricultural sectors, strategic plans must have buy-in from all sides and recognize the unique requirements and needs of each nation.

In the long run, this partnership can and should be judged not on whether or not we were able to strengthen the ministries that my colleagues run but whether or not we've been able to impact and affect farmers at the ground level. But both nations must have agricultural institutions and ministries that farmers believe in and turn to for leadership and technical support.

And in addition to a strong trilateral relationship, we also have been working on strong bilateral relationships, because the relationship between America and Afghanistan and America and Pakistan require individual attention. And we are committed as a country — and the President is very much committed to both the bilateral and trilateral relationships.

I'm encouraged by the progress that I've seen. I'm excited about the opportunities that are created. I remember going to Afghanistan in January of this year, being at a juice factory and seeing the hope that was expressed on the faces of the Afghan farmers who knew full well that they not only were able to sell a crop grown this year but they had commitments for purchasing of crops in future years.

H.E. Mohammad Rahimi: It is appropriate that the world's most important meeting on food commemorates the agricultural scientist who saved the

problems with food insecurity. Pakistan, through its recent horrifying floods that hopefully temporarily damage to the nation — in Afghanistan due to the longer-term devastating effect of 30 years of war.

But we see practical advantages, old and new. Both nations understand the value of trade. Four thousand years ago our countries began trading in beets and gemstones. In modern times we have science on our side, areas in which Pakistan indeed excels.

Building food security in both countries requires a level of cooperation never seen before. So we are grateful to the American government for hosting the tripartite process, to hasten progress between Pakistan and Afghanistan.

Our most recent meetings held in September in Istanbul made important progress in three major areas of food security, irrigation technology and agricultural trade. Our mutual problems of food security require better protection of livestock in animal diseases. This demands better livestock production and protection, animal disease control, and establishing a quality control system for animal vaccines in Afghanistan.

Our countries also need better communication channels for significant trans-boundary diseases, improved capacity for disease detection and surveillance, and harmonizing standards for diagnostics.

Extension and capacity building are other high priorities. For crop production in wheat and horticulture and for food safety, training programs were identified in a four-

“The survival of agricultural activities is essential... We need to work more closely to address the issues of crop and animal health, which are key to economic stability and food security.”

most human lives. Dr. Borlaug said, “The destiny of world civilization depends upon providing a decent standard of living for all mankind.” He could have been speaking of South Asia, where Minister Gondal and I both live.

Afghanistan and Pakistan are more than just neighbors, and our lives are connected in many ways. Many of us speak the same languages or similar, share the same religion, eat the same food, and share the same customs. Today we both face serious

year extension capacity-building program for the time being that will continue with short-term courses and working to improve inputs delivery.

Trade is, of course, a major opportunity for improved relations between our two nations. Afghanistan's ability to reach markets in Pakistan and India, and Pakistan's ability to trade in Afghanistan and Central Asia can potentially benefit both countries' economies and hundreds of millions of people.



H.E. NAZAR GONDAL
Minister of Agriculture, Republic of Pakistan

Previous trade talks were invigorated by the tripartite process, and now the Afghanistan and Pakistan governments have formally approved the new treaty that will allow both countries to prosper.

Trade discussions in Istanbul were heavily focused on technical assistance, capacity development and building mega structures, such as processing plants and cold storages. These are essential for maintaining food security and affordable food prices.

It is now important that we do not lose out on another trading season in that both countries, to speed up the finalization process and communicate its detail to its custom departments and other authorities. Afghanistan is the third largest recipient of Pakistani exports, so this is important to Pakistan exporters and Afghanistan consumers alike.

We also agreed on working together to build value chains for African grapes and Pakistani kinos, a delicious citrus fruit, reaching Afghanistan markets. I believe that Pakistan and Afghanistan are now on the right track towards better water management, mutual food security, trade, economic growth, and lasting peace.

Before most of us were born, Afghanistan agriculture sold cut flowers to Europe and

the Middle East and provided the world with 20% of its raisins. New varieties of crops were introduced, such as apples, and markets were expanding. Afghanistan agriculture was on the right track. But 30 years of war made our agricultural production drop by 3% a year.

And from 2001 to 2007 drought caused the majority of our livestock to perish. War stopped our agriculture and research and extension services to farmers. An average farm is only one hectare, growing only \$500 of wheat a year. The war and drought stopped the non-farm economy and ended our off-farm jobs. Many Afghanistan farmers had to plant poppy or watch their children starve.

When our allies helped topple the Taliban government in 2001, the country was desperately poor but at peace. Then after 2001 we nearly wasted the next seven years in agricultural development. Donors commissioned their own agricultural work without consulting the government of Afghanistan for priorities and strategies. Money was spent on low-priority work for short-term results. Efforts were duplicated. The agricultural sector went largely unassisted and unimproved.

Hungry young men from rural villages

found that the only way to eat was to get paid to carry a gun or plant a roadside mine. Since 2009 Afghanistan agriculture is finally improving. If we stay on course, within four years we can become stable in agriculture, and in 10 years we can become a reasonably prosperous country and an anchor for stability in the region.

This is not science fiction, but it is science. In 2009-10 Afghanistan came close to self-sufficiency in cereal crops. Agribusiness now sells concentrated juice to Canada and Australia, the Middle East and India. America imports Afghanistan raisins from a modern factory with its ISO-9000 certification. Our fresh fruits, dry fruits and nuts sell across our regulation. Afghan entrepreneurs have begun returning home from abroad to trade and invest. The sector is growing again. There are several reasons for these successes.

First, we are finally getting smarter and working as a team. The Afghan government is finally setting agriculture priorities, which we know the best, of course, while our partners provide the financing and technical expertise that only then can provide. The chaos seems over, and the help gets to the farmers and agribusinesses who need them. Second, we finally have a



H.E. MOHAMMAD RAHIMI
Minister of Agriculture, Republic of Afghanistan

good plan. We start with natural resources management, repairing or protecting the water and soil in agri-resources on which agriculture depends. This requires planting forest and providing rural electricity to reduce the need to burn wood. It means incentivizing local communities to take care of their natural resources and to share in the profits. It means rural roads for commercial access.

It means more irrigation and better irrigation — key to agriculture. Today only 25% of our farmland is irrigated, and still half of that water is wasted. So we are beginning to improving existing irrigation work and build new ones, especially small check dams and reservoirs to catch the seasonal water from melted snow.

From natural resources we turn to increase farm production and productivity. This requires rebuilding our research and extension services in cereals, horticulture and livestock. This speeds up the process of introducing lucrative new crops, such as saffron, and increasing the productivity of traditional crops, such as pomegranate.

If a farmer learns to grow pomegranate using the most modern methods, he can quadruple his harvest and up to \$16,000 an hectare, perhaps five times that of poppy.

It is similar for at least a dozen other legal crops. And we are beginning to import new technologies for dry land farming, which can increase wheat harvest significantly.

Productivity also demands farm credit, another area in which we are making progress. We are now building production by setting up a transparent one-stop shop for investors to lease government land that is now idle or misappropriated. Every year we plan to bring 25,000 more hectares onto the leasing market, and investors are interested.

Most importantly we think and work in value chain building through products, product line from the field to the market, the factory and the airport. In agriculture we find that building synergies is as important as solving individual problems.

H.E. Nazar Gondal: The name of this year's symposium, Take it to the Farmer, is not only timely but is very close to my heart. It was relevant yesterday, it is relevant today, and it will remain relevant tomorrow.

Agriculture is the backbone of Pakistan's economy and has a major share in economic development, in the substantial and sustained growth in the sector; therefore it always remains a subject of priority in Pakistan, agriculture policy. Unfortunately,

with the ever-increasing population, the demand for food and feed for both human beings and livestock have also gone sky high with the land and water resources remain more or less constant. This has increased rural poverty and widened the gap between the rich and the poor.

Ladies and gentlemen, as you are aware, Pakistan was recently hit by severe flood, causing the deaths of more than 1,900 persons, the loss of six million hectares. The floods left more than 1.9 million families homeless and killed more than 1.2 million domestic animals. At this point I am grateful to the help provided by the U.S. Government, for the relief and rescue operation is highly appreciated.

The revival of agricultural activities is essential, as it is the only way to bring the rural population into income generation and subsequent asset-formation. We in Pakistan are excited in the new trilateral and bilateral cooperation and expect new technologies for enhancing productivity. We are working together to produce new high-yielding varieties of wheat and cotton, rice and maize. We need to work more closely to address the issues of crop and animal health, which are key to economic stability and food security. ■



GREGORY PAGE
Chairman and CEO, Cargill

KEYNOTE

Private-Sector Leadership in Partnering with Smallholders

Today we are all asked to consider what role smallholders can play in meeting the challenge of feeding our world. Many of my remarks will relate to the centrality of price in enabling their success. And my observation is: If you take good prices to farmers, stand back and watch the incredible progress that can be made in very short periods of time.

When you think about Cargill, you probably think about us working with a lot of large farmers. But in fact, Cargill's business model cannot succeed without successful farmers at every level of production. We believe increasing their productivity is essential to ensuring food security and particularly to do that without increasing the amount of the world's land mass committed to cultivated agriculture.

Does the world have the capacity to grow enough calories to nourish all of our current inhabitants? My answer always is the same — yes now and yes in the future. There are

clearly enough calories produced in the world today, but they don't get distributed in a way that alleviates hunger.

These smallholder farmers are at a level of production that can be price sensitive, and they will respond to those price signals. The prosperity of these smallholders is often the underpinning for more impactful economic development.

What does a smallholder food crop farmer in developing countries need to prosper? Cash.

In addition, there are four basic things, besides cash and certainly besides rain, that are required for smallholders to be successful: First, the opportunity to plant the right crop on the right land. Property rights, increased revenue, certainty and adequacy, and finally and eventually and hopefully, access to open markets.

First, we need to ensure that smallholders grow the crop that makes the most sense and in a way that captures their greatest comparative advantage.

The world will always raise the most food economically and most environmentally responsibly if we raise the right crop on the right land and use the right technology to do so.

China has a comparative advantage by soil and climate in the production of starch crops — wheat, corn, rice — and they have a relative disadvantage in the production of soybeans. So the Chinese government has very appropriately directed their greatest efforts towards the production of rice, wheat and corn, and they've continued to buy soybeans from Brazil, amongst others.

The Brazilians, in turn, import much of their wheat from Argentina and much of their malt for beer. They could, but they have no advantage in growing wheat and barley, and instead commit those acres to producing soybeans.

By trading with each other, the wealth of all three countries is raised.

If China, as a result of a reduction in their trust and comfort with their counterparties,

were to seek to be more self-sufficient, you would actually reduce the aggregate supply of food in the world, and you would raise its aggregate cost.

The second thing that smallholders need in order to be successful is property rights. They must be able to rely on the ability to own land, have access to it and the ability to transfer it to their children. Property is used as collateral for credit, and with property farmers are better able to get the working capital needed to farm successfully.

I spent a fair amount of time in my career living in Thailand where we selected to build an export-oriented poultry production facility. In that area, the combination of clear titles, homesteading and the creating of infrastructure allowed Thailand to weather that storm and more importantly to have what today is an extraordinarily vibrant, export-oriented food production system, no doubt enabled by property rights.

The third thing that smallholders need is a reliable market into which to sell their crops. The reality is that today many smallholders in developing countries lack sufficient revenue certainty and therefore lack the confidence to do what's required to invest in their properties over the medium and longer term.

One of the biggest obstacles many smallholders face is in years of good crops they're forced to sell at harvest when prices are depressed and because the supply is high, take inadequate prices, which further discourage investments going forward.

These farmers are cash-flow destitute with limited access to rural credit, and selling at

public financier providing sufficient capital to take crop inventories across the post-harvest dip. Beyond harvest loans on crops, governments can also help farmers band together and invest cooperatively in storage and other infrastructure.

As governments attempt to pick that very wise price that balances the needs of farmers for adequate revenue to encourage ongoing medium and long-term investment, they have to balance it against the needs of urban consumers. For the system to be sustainable, it is critical that the prices paid to farmers and the prices paid by consumers be the same. In the past,

advanced solution that requires substantial infrastructure. Without these investments, these isolated markets cannot increase food security, and the prices received by their farmers will remain inadequate. Given the increases we have seen recently in food prices, especially in wheat, and the civil strife it's caused in places such as Mozambique and Egypt, it is worth stating again that short-term trade restrictions by government are not only harmful in the immediate term but run the risk of reducing people's confidence and trust in each other.

A year ago at this meeting Bill Gates said, "Food companies need to provide markets

"If we respect the law of comparative advantage, clarify property rights, create improved revenue certainty for smallholders, and, finally, allow for the opening markets and free trade that will benefit their productivity, we can feed the world's population and do it on our current land mass."

governments have pursued these patterns, sometimes successfully and in other times with unintended consequences.

We have observed times when extraordinary interventions have been called for in the short term to deal with excess supplies, and there have actually been restraints on production allotments. Or we have seen support limits imposed on the size of farm that can receive a given price or a given target price.

On the other side we've seen where there are no limits and there is a rapid consolidation of the size of farms, there is a rapid increase in the price of land, and inevitably a dramatic impact on the rural sociology of that country.

Allowing supplies of food to increase in the median term and until in the long term smallholders can travel down a more natural free-market path.

The fourth and final item is to create smallholder prosperity through physical connectivity to the world markets. Once smallholder farmers are more of a competitive force of food production in their own regional economies, they will be better positioned to tap into global food trade. Governments must encourage open trade in a fair, transparent and rule-based and rigorously enforced system so that food surpluses can reach areas of food deficit.

Providing open markets is obviously an

for smallholder farmers by turning them into suppliers." Companies like Nestlé are doing just that, helping to develop the dairy sector in Kenya, Uganda and Rwanda. And one of our neighbors in Minneapolis, General Mills, is working to help small and medium-size food processors and mills in four African nations. Cargill helps turn smallholders into suppliers in many of the countries where we do business.

But we cannot do this alone. We work with our NGO partners, people like CARE and TechnoServe and the World Food Programme, to help address social issues as well as education, nutrition and healthcare. And throughout our supply chains we are working with a number of NGOs, like the World Wildlife Fund and the Nature Conservancy, to improve those agricultural practices that convince the world that we in fact have sustainable agriculture.

If we respect the law of comparative advantage, clarify property rights, create improved revenue certainty for smallholders, and, finally, allow for the opening markets and free trade that will benefit their productivity, we can feed the world's population and do it on our current land mass.

It will be a long and sometimes difficult journey, but we must continue our efforts if we are to honor Norman Borlaug's legacy and strive to feed the world's people. ■

"If you take good prices to farmers, stand back and watch the incredible progress that can be made in very short periods of time."

these depressed prices has a nonvirtuous circle of discouraging further production in future years. In the long run, the private sector can play a role in solving these problems, but first the legal and political environment must evolve to support that kind of private investment.

In the interim until this legal and political framework exists, there can be a role for a



SEAN DE CLEENE
Vice President, Yara International



GABRIELA CRUZ
Farmer, Elvas, Portugal



HON. JOSE FERNANDEZ
*U.S. Assistant Secretary of State, Economics,
 Energy and Business Affairs*

CONVERSATION

Partnering with Smallholders on Strategies for Food Security

Sean de Cleene: To engage literally billions of smallholder farmers around the world and bring them comprehensively into the value chain has required us to, in many ways, from where I stand coming from the private-sector side of things, there's probably an unprecedented level of congruence and willingness to try and find solutions to these partnerships that will engage smallholder farmers and take that to scale at a much more significant level.

I would like to ask the panel what is it that's changed from the previous decades? And how are we going to continue that change in terms of the way we do farming and the way we partner?

Gabriela Cruz: I've been managing the farm for 20 years, and I was brought up on a farm, so I could see what my parents were doing. The partnership between various associations, farmers, enterprises, research

institutes are very important. And they are so important that I can give you an example of what we did and are doing in my country.

At one point we were allowed to grow sugar beets in Portugal. We didn't know the crop; we had no idea how to grow it, and we were in the hands of the company who bought our produce from our farms. And what we did, with the Association of Sugar Beet Producers was an experimental association between the industry and the farmers – in order to select the best varieties, and the best adapted varieties, of sugar beets for the country. And it was so successful that in two years we doubled our production.

De Cleene: Doubled in two years?

Cruz: Doubled. Why is that? The industry was pushing us some varieties they were wanting. They were not the best-performing, so we could bring the experience of Spanish and Italian farmers.

And the adaptation of varieties to our country was much weaker, because we had other countries' experience with those varieties. So in two years we started at a very low level. We were doing 35 tons per hectare, and in two years we reached what the Spanish and Italians were doing, which is 70 tons. That's why we could be so quick, because we had a partnership like this one.

De Cleene: It's very exciting. This wasn't just done in Portugal as an association with the research institutes and the industry, but you were also looking at this from a cross-country perspective as well in sharing that knowledge. But let me ask Matt Kistler of Walmart: what are some of the ways in which you've seen this change significantly?

Matt Kistler: We have three basic sustainability goals that we have, as a company, now integrated globally into every area of the company. Those three broad goals are: to be supplied 100% by

renewable energy; to create zero waste; and to sell products that sustain people and the environment. And today we made nine new goals as a corporation that our CEO announced globally.

I'm very pleased to say that we made nine new commitments around sustainable agriculture. And one of those is to source \$1 billion worth of merchandise, agricultural merchandise, from 1 million small- and medium-size farmers globally. But we also backed it up with providing training to more than 1 million farmers from which we buy now in many countries, including the United States.

And so those of two of the goals that were made today that I think not only show our commitment but, as a corporation, I hope, people are starting to realize that sustainability – for Wal-Mart, sustainability as a business strategy is a good one. And certainly the value that we're seeing not only is financial but obviously, too, has tremendous environmental and social benefits as well.

De Cleene: Robert, from a research institute, I mean this has been something you've probably been wanting to see for a long time.

Robert Zeigler: In terms of what has been changing, we have an opportunity now to see the whole way that rice farming and, by extension, other smallholder agriculture is being managed to be changed. We see today technology that we're rolling out that would allow farmers to get real-time information about what is the best fertilizer to apply on their fields, at what time, in what formulations. It's only a small step to then see how, with that information, they can have access to credit and, again, credit coming through a cell phone. That access to credit will crack one of the most difficult nuts in development that we've had in developing countries over the past decades.

Going beyond that, the crop modeling, geographical-information systems that are coming together, that can be used in a real-time way, allow us to begin to imagine a crop-insurance program that would allow farmers to participate in the credit markets in a way that would give them a level of power and decision-making they haven't enjoyed before – and, of course, participating in markets in a way that they have not traditionally been able to participate.

If we look at how things are changing for

smallholders around the world, I think it's on the tip of a revolution that we're just beginning to appreciate.

De Cleene: Jose Fernandez, what do you see as the challenges and the successes that need to be emulated going forward in this whole framework of partnership for smallholder farmers to achieve the scale levels we're talking about?

Jose Fernandez: I think there may be four or five differences in what's been done before with what we're doing now. And I would first of all focus on the scale. The numbers that countries are pledging to fight food insecurity are unprecedented, and the fact that we're very proud of the fact that the U.S. has pledged \$3.5 billion over the next three years, and that the rest of the world has pledged \$18 billion plus. So that's – the scale is one important aspect of Feed the Future and our strategy.

We're not simply focusing on putting seeds on the ground, but we're looking at things such as infrastructure, working on markets, including using cell-phone technology, looking at gender issues – the fact that in Africa 70 plus percent of the workers on the land are women, but they in many places cannot own the land.

So how do you deal with the title issue in these countries? Technology, including ag biotech, can help address this problem.

Another part of the strategy is making sure that the countries are invested in the strategy. They have to be country-owned. And that means that some of the steps that we're taking may take a little bit more time to actually be implemented because one of the things we want to make sure of is that they're owned by the government, that they are partners in this enterprise.

Lastly, we're not trying to do everything for everyone. We're focusing on, at this point, 20 countries, countries where we believe we can make the most difference, including Rwanda and others in Africa, in Asia and Latin America.

De Cleene: Coming back to a point that was made earlier, and I'm going to ask both Robert and Gabriela about the link between research and the market, and making sure that that link is developed. Are these partnerships something you see that needs more development?

Cruz: These kinds of partnerships are very important, especially in my country. We're facing an enormous crisis, and the government is giving very little money to public research.

What we are trying to do is profit from the research from other countries that have the same conditions as us, like Spain, Italy, and United States. What we can do is tell the market, or the industries, "We want to do what you want us to do." But we need the support of some institutes abroad, some farmers abroad, and the companies who supply the inputs for us.

De Cleene: You're seeing much more virtual partnerships in that sense. This isn't a traditional partnership done in Portugal, developed with Portuguese associations. Robert, from your side what are you seeing?

Zeigler: There has been a decline of public-sector research. The private sector can do an awful lot, but one of the things that it's not particularly good at is a lot of the innovative research that is pre-competitive, that actually goes out to creating a platform upon which new technologies and new products are built. Without a vibrant public-sector research dimension to our whole overall food-security strategy, we're going to run into trouble over the long run.

De Cleene: Traditionally, for a lot of the international donors and agencies around the world, there's been a difficulty of having this broader alliance that involves the private sector. But with this, is it possible to have these kinds of pre-competitive, dynamic partnerships that then, later, lead to more market competition issues later on?



MATT KISTLER
*Senior Vice President of
Marketing, Walmart*

Fernandez: I think it's critical. What we're trying to do is to find ways to work with the private sector. And what I'm seeing so far is actually quite encouraging.

Well, the fact of the matter is that, at least what I'm hearing from many companies, is that, yes, they would welcome a partnership, a collaboration with the U.S., with universities, with civil society, to try and open some of these markets — and that, in fact, many of them are already looking at ways to do so.

De Cleene: So Matt, do you see a role that government can have, as Jose was saying, in terms of galvanizing, in terms of facilitating this? Or is it something that you should do as Wal-Mart and you don't need help? Or is there a broader alliance that can be formed?

Kistler: Yeah. Quickly the answer is yes and yes.

We have a network of NGOs, of governments, of suppliers, of other retailers, academics in many areas, thought leaders in many areas; fourteen of these networks. One of them is around agriculture.

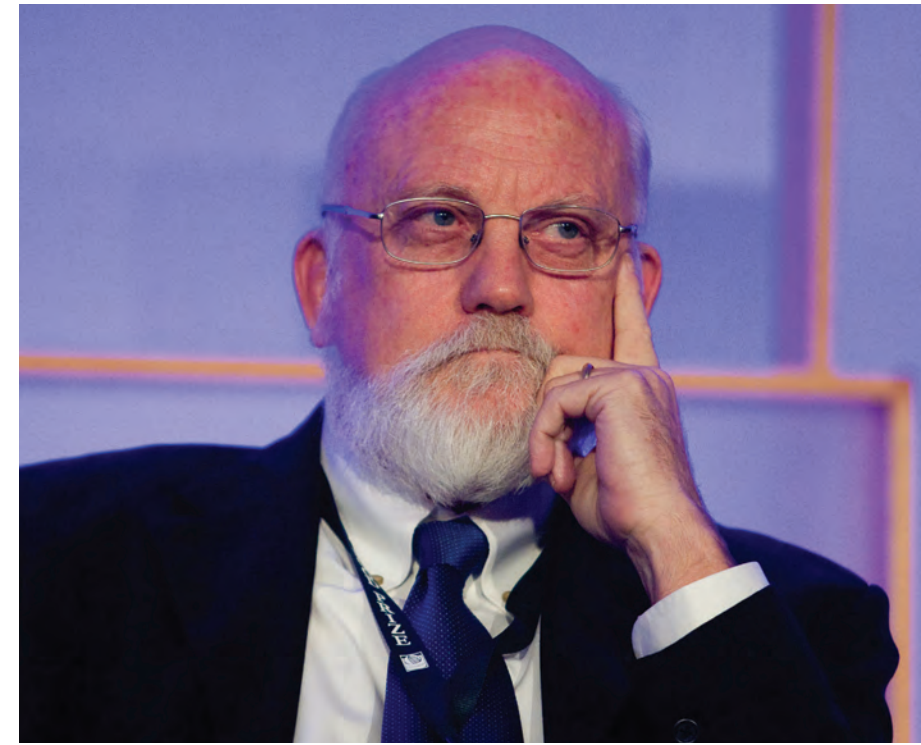
And I'm happy to say that after today's events that we had, we'll be accelerating our efforts around sustainability in

agriculture. And certainly the efforts that we're doing are open-source. Anything that we learn in this area we are sharing with everyone, including our competition, and working with a number of universities and stakeholders now to get that information out and do more research around it.

De Cleene: The kinds of developments that this requires, to broaden that out to include issues of climate change, mitigation issues, into farming, and to look at conservation farming — does it also require a new kind of partnership? Do we need to be reaching out beyond just the traditional agriculture sector, in this sense, to the environment sector and to other sectors?

Cruz: Well, definitely. One of the ways we should be able to do so, and the European Union should permit us to do, were the biotech crops. You may know that we can only grow Bt corn in Europe. There's an enormous opposition to the biotech crops by very much misinformed people. Society trusts journalists more than scientists. And we get into a sort of narrow strait where, if we don't have enough tools, we cannot be efficiently producing and be sustainable at the same time.

De Cleene: Robert, how do you respond



ROBERT ZEIGLER
*Director General, International
Rice Research Institute*

to this? For African or Asian farmers, this is even going to be more pressing as the impacts of climate change really take effect. And is there a tradeoff between food security and climate change?

Zeigler: That's a very pertinent question. By looking at the challenges both from the perspectives both of the farmers' needs today, the needs of the environment tomorrow, and the challenges that will be facing farmers in the future, we have an opportunity to develop multiple-win solutions and multiple-win scenarios.

I'm extremely sympathetic with the European farmer who is, instead of being allowed to take the best of technology and aggressively meet the demands of society — that same society is placing constraints on the farmers. And I hope that that doesn't happen in developing countries.

Fernandez: I do think we've got to bring ag biotech to the forefront of the discussion. Not as a silver bullet, but as a way of addressing climate issues, hunger, and needs of developing countries.

Actually we've had some success in a couple of the countries of trying to work with the regulators to create alliances and engage in capacity building with a lot of

our land-grant universities to try and get them comfortable with the technology.

De Cleene: Matt, this whole issue of trying to enhance food security while balancing growing perceived needs of climate change — how do you deal with that from a company perspective?

Kistler: We are working in ways that we never worked before, developing — from, literally, the farm up — products, increasing agriculture in the United States, but also working abroad in sourcing as a means of development.

We set a goal to only source or only use sustainably sourced palm oil in our private-brand products, products that Wal-Mart designs and works with manufacturers to create for us. That one, small move is going to remove about 5 million metric tons of greenhouse gases, permanently, from the environment.

The key is to really focus on a couple big issues and work together collaboratively, which I think as a company we are doing; and then start making progress against some of the big things that we are trying, as a global group of people here, to make a difference around. And I think that's the key.

De Cleene: So do you think there's a need for a new kind of, type of, brokerage/facilitation institution that will allow smallholder farmers to engage in these big discussion topics that are going to impact them significantly?

Kistler: There very well may be in the future. Over time, you're going to get beyond the capabilities of what's in place today, and so what the future holds, I'm not sure. But I think certainly by getting the right direction started; it's something that we started today and I hope others do.

De Cleene: Jose, what do you see? I've seen this very much in terms of developing things like the agricultural growth corridor in Tanzania and in Mozambique, but the role or the nonexistence or the existence of these kinds of new facilitative/brokering partnership platforms at a country level have been critical. But they don't exist terribly much, as such, today, and so we're having to rethink this a bit.

Do you share that, or how do you see that?

Fernandez: I share that. We need to leverage some of these institutions and try and work with them, either on a regional basis or on a product basis. ■



“We don’t just want to buy food from anyone — we want to create markets for the most vulnerable smallholders. And we intend to document what’s working and what is not, and explore its expansion, especially in priority agricultural communities, such as Southern Sudan.”

- Hon. Rajiv Shah,
Administrator, USAID

HON. RAJIV SHAH

Administrator of the US Agency for International Development visits with community members in Sudan.



HON. RAJIV SHAH
*Administrator, U.S. Agency for
 International Development*

SYMPOSIUM BREAKFAST KEYNOTE Renewed Global Focus on Fighting Hunger

We're focused on global food security in a way that this government has not been since the earliest days of the Green Revolution, working together in a united approach to finally conquer hunger.

At USAID we've established a new Bureau of Food Security for our agricultural programs, improving nutrition, and focusing on women and girls. We've unveiled the Norman Borlaug Commemorative Research Initiative [with] USDA to help farmers deal with pests, disease and a changing climate.

One of the first priorities has been wheat rust (Ug99). We're already seeing Ug99 threaten the food security and the recent productive agricultural gains in Pakistan and Afghanistan, which could lead to losses of more than \$9 billion a year. We're working with the Agricultural Research Service to support greenhouse research in Minnesota, develop adapted rust-resistant varieties in Pakistan, and then test their performance in other parts of the region. We estimate these will be adopted by

nearly 3.5 million farmers over 5 million hectares, yielding an additional 250,000 tons of wheat and generating \$63 million in smallholder income.

Finally, we're transforming our food assistance program. We are now the fastest provider of food aid in the world. We focus on vulnerable populations, like pregnant women and infants, as part of a new effort to prioritize the first "1000 Days," from conception to age 2, when children are most vulnerable and when improved nutrition yields benefits through their entire lifetime.

We're transitioning away from monetized food assistance to provide more direct support to organizations. This year we've spent \$250 million in local procurement of food aid, up from nothing just a few years ago. We don't just want to buy food from anyone — we want to create markets for the most vulnerable smallholders. And we intend to document what's working and what is not, and explore its expansion, especially in priority agricultural communities, such as Southern Sudan.

But what's really exciting is what our

partner countries are doing on the ground. [In Tanzania], food insecurity has spread throughout the country. One-third of Tanzanians live below the poverty line. 44% of children under 5 show signs of stunting. Malnutrition underlies between one-third and one-half of all child deaths. Despite [over]-5% GDP growth over the last decade, we have not seen a meaningful dent in these numbers. And Tanzania is not on track to meet its MDG-1 poverty and hunger targets.

That's why we're joining with the government of Tanzania and its partners, collectively placing our bets in the target regions and specific value chains that the Tanzanian government has chosen to prioritize based on selective and rigorous analysis. This is driven by the fundamental understanding that we cannot do everything everywhere and expect to do it well.

By providing a thoughtful strategy [and] tight geographic focus, Tanzania is able to ensure that bilateral and multilateral partners' support is complementary and aligned. While USAID invests in



agricultural value chains, the Millennium Challenge Corporation will rehabilitate and build out the trunk road system. The African Development Bank is providing credit to develop feeder road infrastructure. JICA is building an irrigation scheme, and the World Bank is building a regional center of excellence in rice research. We are working with the State Department to support Tanzania to liberalize and reform policies to avoid the current prohibitions on market access that limit lending and market activity for smallholder farmers.

This coordinated focus is helping private firms expand their investments. Yara is providing investments to build out a better fertilizer system. Unilever is looking to source from that region and foster further demand. General Mills is providing technical assistance to local millers.

But the main private sector partners are the dozens of local Tanzanian firms that work with smallholder farmers to sell seeds and transport and process product. AGRA [has] six small seed companies that are thriving as demand for hybrid seed goes up. We're offering companies debt guarantees to mature their businesses further and help grow the rural economy.

In addition to regional selectivity, the strategy concentrates resources in rice, maize and horticulture. Rice can best spur economic growth, potentially benefiting 80,000 Tanzanian rice farmers over a 5-year period. Drought-tolerant maize strains can boost yields by 30% in low rainfall years [and] would help almost 130,000

smallholder farmers escape poverty by 2015. Horticulture development helps address the severe micronutrient deficiencies that lead to child stunting and child malnutrition and, importantly, disproportionately benefits women farmers.

Since these can be intercropped with traditionally male crops, it does give women access to quicker, cash-based crops and access to improved strategies for dietary diversification for children and improving household nutrition overall.

In Tanzania, we estimate our assistance will help lift more than 2 million smallholders, the majority women, out of poverty in a sustainable way. But we will not treat that as faith.

As a field, we've collectively underinvested in collecting baseline data and quantitatively evaluating programs and performance at scale in many of our areas of investment. That's a trend that we all must reverse, partnering with host countries, providing resources to do household-level surveys and analysis in order to both document outcomes when we achieve success and learn from failures.

But it's not just happening in Tanzania. Prime Minister Sheikh Hasina launched a strategic approach in the southern productive regions of Bangladesh, focusing on specific rice, wheat and maize growing areas, and on some new crop varieties that are more stress-tolerant and that will boost the nutritive impact of these staple crops.

Success is possible.

Malawi showed us how quickly a country can ramp up agricultural production with the right conditions. Ghana showed us the benefits of steady reductions in food insecurity, and Brazil is showing us that you can go all the way to eliminating hunger by doing smart, innovative things with nutrition as a complementary intervention. If we can learn from and replicate these types of successes, we will have created the foundation for a sustainable new Green Revolution.

We should be honest, even as we celebrate, about the stakes involved. For USAID our agricultural investments are the flagship effort and a fundamentally new way of doing business that I hope becomes the model across the entire agency. Feed the Future is a core plank in the most important development strategy since President Kennedy created USAID.

But our stakes are nothing compared to what the world faces.

We live on a planet whose population will grow by 2 billion in 40 years; 2 billion additional people will move from very poor populations to the middle class, completely redrawing the agricultural map as their diets and tastes change, and in an environment with decreasing resources, increasing demands for water and energy, and an increasingly unstable climate.

Maintaining a high level of commitment to this work will be difficult. Already,

“We must be persuasive and vocal advocates, not just for ending hunger but the specific strategies and approach to achieving that.”

From Ethiopia to Senegal we're seeing governments make tough choices to invest in one or two subregions and a handful of value chains, and then ask donors and partners to align their strategy.

If this approach works in just the four countries I've mentioned, [it] will benefit approximately 4 million farm families and lift nearly 17 million people out of poverty. This includes almost 1.6 million children who will be able to escape a life of daily hunger. [And] let's not forget in our statistical clarity how meaningful it is that we can end that plight for 1.6 million children.

Unfortunately, we're seeing some donors fall away. So we must not only measure and demonstrate convincing progress in the narrow window that we have to succeed — we must be persuasive and vocal advocates, not just for ending hunger but the specific strategies and approach to achieving that. We must build a lasting, durable constituency that maintains the focus the world has now rediscovered.

We've seen the repercussions of our inattention over the last several decades. Now let's show the world the power of our vigilance. ■



CAMILLA TOULMIN
*President, International Institute for
 Environment and Development*

PRESENTATION

Land Issues Facing Smallholders

Well-informed and passionate voices say very clearly that smallholder farmers, women and men, must be at the center of agricultural development strategies, taking science and infrastructure to the farmer while at the same time generating more resilient and sustainable systems. We've heard that we should be helping smallholders develop their businesses, manage their soil fertility better, try out new seeds and crops, get their crops to market and make sure they get paid in time.

We're at one on this, but what about that fundamental, basic resource on which all of this depends — the land? Mark Twain once urged people: "Buy land — they're not making it anymore." And lots of people seem to be taking his advice. So where does that leave smallholders?

You need to have secure access to land if

you want to be a farmer, either as an owner-occupier or a tenant. In many parts of Asia and Africa, smallholder rights are insecure. In West Africa, less than 5% of land has any kind of paper documentation. That tends to be land in cities, land in irrigation schemes. And the process for getting land registered is long, slow, bureaucratic and expensive. It's effectively impossible for the vast majority of people. A very eminent lawyer in Ghana tells me it took him — a top lawyer — more than 18 months to get the registration of a purchase of land that he had made.

The fact that land rights aren't written down does not make them any less real, but it does make them a lot more insecure. Even in more distant areas, people who thought they were secure are finding their customary rights of occupation and use at risk. These may be people who have been

farming, living there for many generations, 200 or 300 years. This may be their farmland, their woodland or their grazing land — often considered by government to be wasteland and unoccupied and therefore able to be transferred to others.

I've been looking at simple, low-cost methods for registering rights to land for the last 15 or 20 years. Until about five years ago, I thought everything was moving in the right direction. Many national governments saw the huge benefit from providing secure rights to the smallholder farmers.

But when land began to be more hotly competed for, both domestically but also from outside investors, that attitude changed. Now a number of governments see agricultural land as they've seen their oil and gas, forest resources — as a valuable national asset that should be managed by

national government, rather than by local communities and people dependent on those resources.

This competition for land, what some refer to as a "land grab," has been greatly accentuated by the impact of the oil, food and commodity price spike of 2008. It's difficult to know exactly how much land is being acquired, as much of the negotiation is being done behind closed doors, over the heads of local people with compensation and consultation often minimal. Evidence shows that it's often as much domestic investors and those from Europe and the U.S. who are most important, rather than the oft-quoted "villains," if you like, from China and the [Persian] Gulf.

How much land is actually being involved in these deals? I can't tell you. Nobody knows. Some say more than 50 million hectares around the world, others say much less. If it were 50 million hectares, then at an average of 2 hectares per household, that's the livelihoods of 25 million households. It's not insignificant. Such land acquisitions tend to be on the better land, with good water, good access to infrastructure, so that the impact is greater than the number of hectares per se.

We carried out a survey last year and came up with a figure of just over 2 million hectares for Ethiopia, Ghana, Madagascar [and] Mali from 2004 to 2009. But I'm sure we did not get all of the data on these deals underway. Most investors were private sector, not foreign governments, with a very few large deals such as the 450,000 hectares in Madagascar leased to a European company. To give you a sense of the sensitivity, one of the researchers asked not to have his name put on the report, because he feared trouble from his government if he was involved in a study seen to be critical of government policy on land allocation.

The World Bank also admits they don't know how many hectares are involved in these transactions. The information is not freely available, and governments won't give it to them — not even the World Bank.

So why do these sales matter? Land rights, once lost, are almost never regained. It's not the kind of thing that you can get back. You can develop as many market-access initiatives and bring appropriate science and technology to the smallholder, but if that smallholder loses secure access to land, either as owner or tenant, then what's the point?

Land security programs involve a number of elements. First is clarifying and documenting rights through titling and certification, usually mapping boundaries

and agreement with neighbors as to where those boundaries lie before some kind of certificate is issued. Some interesting work in Tigray in Northern Ethiopia shows that you can issue certificates at the cost of around a dollar per plot. It doesn't have to be prohibitively expensive.

There may need to be new legislation to ensure that people know the provisions of the law. It's good to have a series of laws on the statute book, but they're pretty well worthless unless people know that they're there, what they mean, and how to access them. There's some interesting work in Mozambique at the moment, setting up a legal land fund that enables people access to that information.

Improving access to information about land holdings and claims at village and higher levels is also urgently needed. We've seen the transformation of banking and insurance through mobile technology. Is there some way to make similar, big strides as regards mapping and protection of land rights?

Those on the one hand say, "This is a land grab; all inward agricultural investment is bad," and on the other people say "Any investment is good investment." You need to take a middle course and look at the

to local people, government and investors?"

We think that large-scale agricultural investment has great potential to raise rural incomes, to bring new technology and to open up new market opportunities for smallholder farmers when done in the right way. But as the World Bank report referred to earlier shows, many of the deals underway do not seem to be following that kind of practice, with investors targeting those countries where governance is weakest.

So what might be some of the next steps that could help us move agriculture investment in the right direction? What role is there for people outside that country?

Getting more and better information is important but difficult. Engaging with decision-makers in government could be a good route to provide the best possible counsel so that, when they come to negotiate these deals, they've got good legal advice on their side [that] matches what companies and investors have. It could also be worth working with some of the principal investors, especially from our own countries, to encourage better practice guidelines and establish a race to the top rather than a race to the bottom in terms of standards of behavior.

“You can develop as many market-access initiatives and bring appropriate science and technology to the smallholder, but if that smallholder loses secure access to land, either as owner or tenant, then what's the point?”

detail. It makes more sense to invest in farmers rather than farmland. Large-scale agricultural investment has great potential to raise rural incomes, bring new technology, and open up new market opportunities for smallholders when done in the right way. Local people can become contract farmers, or joint ventures can be set up between investor and local communities. But many of the deals underway do not seem to be following that kind of practice, with investors targeting those countries where governance is weakest.

We argue that you need to take a middle course and look at the detail. We argue that it makes more sense to invest in farmers rather than farmland. And for the people that we work with in many African countries, they say, "Let's look at the terms. Can a deal be done which brings benefits

Citizen empowerment is a key part of farmers being able to stand up for their own rights. Farmers need to know the law, they need to know their rights and how to protect them. If you look at the experience of China and the introduction of the household responsibility system at the end of the '70s, you see an enormous energy unleashed when people feel that they've got strong rights over the land they're farming. You put a lot more energy into the care of the soil, vegetation, drainage and so on. You see vastly improved yields and productivity, particularly when you combine it with freedom to market and sell your crop. You see the same thing happening in the former Soviet Union. There are enormously powerful forces that can be unleashed. ■



“Agriculture is a motor that would permit a country to develop. We hope that you will continue to provide us assistance, especially with machinery, so that the peasant will be able to get some relief...”

“A lot of our kids are malnourished. For those who live in high areas who are heavily dependent on rainfall, if they have a good season, it’s good, and if not they are in serious difficulties.”

**- Jacqueline Morette,
Farmer, Haiti**

JACQUELINE MORETTE

Farmer in Pouly, Haiti, pictured visiting a farm in Iowa.



PHILIP NELSON
Professor Emeritus, Purdue University



HOWARTH BOUIS
Director, HarvestPlus



H.E. FLORENCE CHENOWETH
Minister of Agriculture, Republic of Liberia



DYNO KEATINGE
Director General, The World Vegetable Center

CONVERSATION

Producing More Food and Better Food

Philip Nelson: Filling one's stomach doesn't necessarily mean that you have a good life. We've had tremendous advances in agriculture, but there's much more to be done that involves the total food chain, not just producing more.

Post-harvest losses are big numbers. No one, I don't think, really knows how much food is lost after harvest. Cambodia had a bumper crop of rice, but half was lost because there was no way to store or distribute it. We've planted fruit trees in Afghanistan where, once harvest came, there was no way to get it to the marketplace before it spoiled.

H.E. Florence Chenoweth: When it comes to hunger, we are still not approaching it holistically. So we talk about market improvements, about access, about new seeds. But we're paying so little attention to nutrition. [We are] silent. Why? Is it because malnutrition affects the very, very poor? Nutrition is one of those things that is neither in agriculture, it's neither in health — it kind of floats. So I'm quietly trying to push it into a direction where we can make it a priority and give it a home.

I'm also concerned that the emphasis, in terms of malnutrition, seems to be on food fortification, on supplements. Vitamin A — we can get it from food we grow. Why do we have to depend on supplements? It affects more people than the 1 billion who are hungry, micronutrient deficiency. Let's use the brains of the scientists of the 21st century to breed those seeds, that we can grow rice that will provide the nutrients; that we can grow other crops, that we can give these seeds to small farmers, let them grow these seeds, and let them get the nutrition. It's one of those things that I would like for all of us to say — just do it.

Derek Yach: With my roots in medicine, [I'd like to] remind ourselves of the words of Hippocrates from 400 B.C.: "Everyone has a doctor in him or her; we just have to help it do its work. The natural healing force is the greatest force in health." And then, "Our food should be our medicine." That has been understood deeply in the wisdom of all cultures around the world, yet we don't actually structure the way we approach either agriculture or nutrition accordingly.

We've seen over the last decades that the focus on addressing health issues, for the

middle class particularly, has been through medications, devoid of thinking about food excess or food quality. And food for the poor tends to focus on food for fuel rather than addressing the quality issues.

I would hope that we can start to think about the links between food quality, food quantity, agriculture, and the environmental roots. We won't be able to address the problems of hunger without critically looking at one unified food supply that is, at the same time, driving rising levels of cardiovascular disease, chronic diseases, and diabetes — off the same land that is unable to provide the food required for hunger.

Unless we unify the agricultural thinking and the nutrition thinking of those addressing undernutrition and the drivers of chronic diseases, we will only be slicing off part of the opportunity to address world hunger and do[ing] so in a way which will be profoundly unsustainable from an environmental point of view. Some of the emerging conflicts that we have between the growth of our consumption trends fueling cardiovascular disease in India, China and Africa are going to have very serious consequences for the long-term access for

the food needed for the poor.

I would hope that we might draw far more people [from] health and nutrition into debates, asking these tough questions around the direction that we're taking that runs the risk of drawing a schism greater between addressing hunger on the one hand, and overconsumption and excess on the other hand — all of which are occurring at a time when the environmental threats are rising in front of us.

Dyno Keatinge: Malnutrition, obesity, Type 2 diabetes, and metabolic syndrome [are] lethal pretty well everywhere in the world currently. It is here in North America and also in Europe. It's a severe problem in India; at least a fifth of all diabetics in the world now are Indian. 10% of the Chinese population as a whole is prediabetic or diabetic. Type II diabetes is not a genetically induced disease but a dietary-induced disease; it occurs in small, vulnerable states, it occurs in rich states and occurs all over the world.

If we're going to challenge this scourge of malnutrition, we have to get people to change their diets, to get them eating balanced diets appropriate for their health, consuming more nutrient-dense fruits and vegetables, and reducing excess carbohydrate ingestion. For this to happen, products need to be available, accessible, and affordable.

The agricultural research community, the health and nutrition community, the

food and beverage industry must work together in coalition to find solutions to current production, post-harvest, and domestic science issues, which can promote availability, lower prices, and reduce post-harvest losses of agricultural commodities. And this research and development effort has to be done in parallel to the drive to increase the size of the pile of rice or maize or wheat. It's not good enough to be able to feed the world in 2050, if at the same time we fail to nourish it.

Vegetables are the key products that can serve to close these nutrient gaps in both minerals, vitamins, and folates. It's today vital that we recess our current strategy of breeding primarily for yield and appearance and consuming vegetables with very low nutrient density. Not all vegetables are created equally. Standard tomatoes that you might get in a hamburger, and the coleslaw that goes with it, essentially have almost no nutrition whatsoever — little vitamin A, tiny bits of vitamin C, and not much else. Other green leafy vegetables are in fact highly nutrient dense: full of vitamins, full of minerals, and full of important issues like folate. And yet, virtually no attention is being paid in terms of research and development to the green leafy vegetables. Aibika, for example, *Abelmoschus manihot*, is the nearest relative of the okra. No research dollar has been spent on this species in the last decade. The germplasm is not collected, and it is not bred in any way.

Howarth Bouis: Staples, of course, are the cheapest way to get energy to keep from going hungry, but you need essential minerals and vitamins for a healthy life, for a productive life. Non-staple plant foods are more expensive than the staples, but not as expensive as fish and the animal products, so if you want a high-quality diet, you want to avoid mineral and vitamin deficiencies, you have to eat a lot of those foods.

From 1970, roughly, 'til 2000, populations in developing countries doubled. But the great feat of the Green Revolution was that cereal production more than doubled, increased by 150%. So what happened to cereal prices? Well, for Bangladesh in 1995-96, rice prices fell by 40%. But when you look at the other parts of the diet, production increased, but only by 25-30%. You didn't have the technological change for those crops. Fish prices in Bangladesh [and] prices of non-staple plant foods doubled during that period. So rice was cheaper for the rural poor, but the foods that provided the minerals and the vitamins became more expensive.

Rice provides 80% of the calories for these rural poor. Fish and animal products, only 3%. But where they're spending their money, something like 20% of their food budget is going for animal and fish products, which is 15% of total income. This is where the poor want to spend their money, the kinds of foods that they desire, but they're constrained by income. And



JACQUELINE MORETTE
Farmer, Pouly, Haiti



JOSEPH TAETS
Vice President, ADM Grain Group



DEREK YACH
Senior Vice President for Global Health, PepsiCo

you can see that rising food prices make it more and more difficult for the poor to purchase those foods. This is why we see so much mineral and vitamin deficiency in developing countries.

Those food staple varieties that we currently consume – they’re not dense in minerals and vitamins. But through plant breeding we can increase the levels of vitamin A, of iron, of zinc in the food staples and thereby do something to help reduce the micronutrient malnutrition, which is becoming worse because of the increases in the food prices.

[In] Mozambique and Uganda we introduced orange sweet potato into the diet. This was a population that eats white sweet potato, which has no vitamin A. Orange sweet potatoes are just as high-yielding, just as profitable, but by getting households to switch to the orange sweet potato, we were able to double their vitamin A intakes. The food staples before did not provide any vitamin A; now they’re providing 50% of the vitamin A in the diets. Now, [we are] working on high-iron and high-zinc rice and wheat and pearl millet for South Asia. We’re developing high pro-vitamin A maizes, high pro-vitamin cassavas, in addition to the sweet potato for Africa, and also high-iron beans for Africa.

Joseph Taets: My division, Agricultural Services, is that key supply-chain point to transfer from farmers, both small and large. Through that transformation we have invested a lot of money in infrastructure.

Infrastructure we see as being a key, critical point in eliminating or reducing post-harvest losses.

We’re also partnering with industry experts, both in the public and private sector. We’re working with the University of Illinois and the University of California-Davis on a post-harvest project where we’re trying to help solve and eliminate post-harvest losses, both in cereals, oil seeds, grains – but also in the area of fruits and vegetables and other, more perishable products.

Leveraging ADM’s assets, our resources, our industry expertise – we have numerous examples. We had the natural catastrophe in Haiti this past January, we suddenly found ADM in a unique position. We had 700 metric tons of rice in Haiti in an area of the country that was not damaged by the natural catastrophe. We made a donation. We worked with the World Food Programme, and we made that rice immediately available to Haiti. And I think it was a key, critical example of how agribusiness can and should work to leverage its assets, its expertise, particularly to react in a time of critical need.

Jacqueline Morette: In Haiti the government is very negligent toward the agricultural sector. That has marginalized infrastructure in rural areas. Much of the country is mountainous [and] we are heavily dependent on rainfall; [at] times [of] too much rain you would lose [soil], or too little rain you would lose

[production]. So much of our agriculture is very subsistence-level. And all of this condition affects our capability to produce, our capability to market, as well as our well-being. A lot of our kids are malnourished. For those who live in high areas who are heavily dependent on rainfall, if they have a good season, it’s good, and if not they are in serious difficulties.

The country is heavily centered in Port-au-Prince. And all of the assistance we could get, like extension services – those who provide the services live in Port-au-Prince. We in the rural areas are essentially by ourselves. We do not have access to mechanized ways like tractor or other tools for production. And there is no other way for income and to work efficiently. That has a huge influence on leading many of our small farmers to get discouraged and stop, in many cases, cultivating. A lot of our supporters in the international donor community – I would say close to 90%[are] in Port-au-Prince. The rural areas have not seen much. That’s why we are stressing local cooperatives in order to facilitate those small farmers’ ability to produce.

If you have a small piece of land, you don’t have seeds or even fertilizers, what can you do? I mentioned infrastructure – we have high rate of post-harvest loss. Our effort at the moment is to increase production and educate the population how to use whatever small, meager transportation system we have to reduce as much post-harvest loss as possible. And we are now trying to create

programs outside of agriculture to provide employment so that people can improve their income.

Keatinge: Only 10% of research over the last decade has gone into post-harvest research, versus 90% for production. But there is a lot of current technology available — modified atmosphere packaging, solar drying, a whole range of different things — which can be applied to these products and not only increase their shelf life, but improve the seasonality issues which are associated.

Chenoweth: We are using solar drying, and that is helping. Especially for those people who are not the urban poor, because they have access to the fortified foods, but the rural poor. As I said before, getting those seeds out there, those varieties that will provide the micronutrients. And then we can work on encouraging people to eat [what] is available to them, [what] is right at their doorstep.

Liberia [is] a country with 45% of our people food insecure; 19% chronically hungry; over 70, almost 80, percent unemployed; 43% [of the population between] zero and 15 — huge challenges.

But we are trying to diversify food away from just our staple, rice, to sweet potatoes, to those food products that are higher in food nutrients and not just carbs. Peanuts, for example – but there’s this belief in the poorest spots that if you give children peanuts when they’re young, it will spoil their skin. We’re trying to show them –

you give the child a peanut, you see how hungrily the child eats. We’re making some advances there. Also, fish production – most of our country is away from the ocean. We are massively digging fish ponds, pushing aquaculture. The problem is, I cannot keep the fingerlings in those ponds long enough. They get [to] size, and they become dinner.

Nelson: What technologies exist to allow on-farm storage capacity to increase at the smallholder-farmer level; so that the farmer can hold grain back until they can get a good price? What technologies can be scaled down?

Taets: I see numerous examples of not-very-sophisticated storage techniques that would work in this instance. One is almost like a silo bag. I’ve seen it work in Turkey in the case of sunseed. I’ve seen it work in South America in oilseeds and grain crops, and it’s simply a plastic sack like a long tube.

In the case of post-harvest losses, it’s a lot about the efficiency of the supply chain – not only storage but transportation. It’s about a developed processing industry that can receive commodities. It’s about partnerships of public and private sectors working together. It’s about efficiency of supply chain and transportation, having trucks and rail cars, barges, seagoing vessels. It’s really not one issue; it’s a combination of dynamic characteristics that really make supply chains inefficient and lead to post-harvest losses.

Yach: The roots to better health have always been through agriculture. We need

to let that single message be known more widely and bring together the two sectors in a much more intimate discussion.

Chenoweth: We cannot get away from feeding people. 1 billion hungry today — let that number not go up. We need to grow more food, but more healthy food, and cut down on the losses.

Keatinge: I can deliver enhanced nutrition to large numbers of people, but not with both hands tied behind my back by lack of money.

Bouis: Minerals and vitamins are not a luxury – they’re essential. Agriculture is the main source of minerals and vitamins. Agriculture needs to increase incomes, reduce poverty – but an essential role of agriculture is to provide minerals and vitamins for a healthy, productive life. And we have to talk about that much more.

Taets: I came across a quote from Mother Theresa. She said, “If you can’t feed a hundred people, feed just one.” Whether you’re a large corporation or an NGO or a personal individual, we all collectively have a part to play in more food, better food and solving world hunger.

Nelson: And the last sentence from our farmer.

Morette: Agriculture is a motor that would permit a country to develop. We hope that you will continue to provide us assistance, especially with machinery, so that the peasant will be able to get some relief. Thank you very much. ■



NAO BEE LOR
Farmer, Xieng Khouang, Laos

“I have 10 cows that I keep in my pens around my house, and I feed with the new [variety of] grass. Before the project came, I only was able to raise one cow at my house, but now I can raise ten or eight a year. Right now I have four times the income [as] compared to past years.

“Many farmers from my village and other villages visit me, to learn from me because I am a modern farmer in the village. More than that, other NGOs also visit my family and my farm to learn from my lesson... I’m very proud.”

- Nao Bee Lor,
Farmer, Laos



ALICE PELL
*Vice Provost for International Relations,
 Cornell University*



NAO BEE LOR
Farmer, Xieng Khouang, Laos



CHRISTIE PEACOCK
Chief Executive, FARM-Africa

CONVERSATION

The Role of Livestock in Supporting Smallholder Agriculture

Alice Pell: The U.N. has a really excellent definition of food security – [that] we’ll know when food security exists when “all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for a healthy and active life.” And that includes a lot of micronutrient issues. About half of the pregnant women in the world suffer from iron-deficiency anemia. In most villages across the planet we actually already are making iron supplements that are produced by local smallholders.

Nao Bee Lor: I have a 4 hectare farm, and I started to grow grass since 2005; we have a local variety and we have a new variety also. The ag team from the district level taught our farmers to grow [grass for] forage and to cut and take it to the cows to eat.

I have 10 cows that I keep in my pens around my house, and I feed with the new [variety of] grass. Before the project came, I only was able to raise one cow at my house, but now I can raise ten or eight a year. Right now I have four times the income [as] compared to past years. Many farmers from my village and other villages visit me, to learn from me because I am a modern farmer in the village. More than that, other NGOs also visit my family and my farm to learn from my lesson. [And] when the traders came to my village, to my farm, they found that my cows are very healthy and very nice; they gave me a good price. Not only [do] I raise cows, but I also raise chicken, peas, fish, and I also grow vegetables around my farm as well.

Christie Peacock: It’s my passionate belief – and there is a great body of evidence to show – that livestock can be the fastest route

out of poverty for many people, in Africa, Asia and other parts of the world. Of course livestock are important to pastoralists; but when I worked in Ethiopia, I started to learn the importance of livestock in the lives of smallholder farmers. When crops fail, if you had two or three goats, then you could survive. You could sell those goats, you could buy food in the market. If you didn’t have those goats, you were going to be on food aid. It was as simple as that. That’s one of the very many unrecognized roles of livestock. And in the absence of banking systems, insurance systems, livestock will continue to play that role.

On small farms – an acre, less than that in some cases – there’s great difficulty in increasing yields and incomes on the back of staple crops. Farmers in parts of Tanzania have actually been digging up coffee trees to plant grass to feed to cows, because that’s

where they get the most income. [Yet] less than half of 1% of aid goes on livestock, when they contribute 10-20% to GDP in many of these countries – it’s absurdly disproportionate. And it’s not just a valuable thing to sell; they can actually consume at home. There’s a lot of evidence now about the role of animal-source foods and their important role in child development, particularly mental development.

We do have issues to deal with, particularly around health; health of livestock impacts trade, human health and zoonotic diseases. There is a need for the state to oversee animal-health delivery systems. But, equally, there is a need to move on from an entirely subsidized state veterinary service, which in Africa is simply not sustainable, through linking qualified vets with livestock technicians, down to the grassroots and having trained community animal-health workers, or barefoot vets. Now, that’s a stop-gap measure; we need to work towards a stronger system of delivery that will unlock the potential, finally, of livestock for poor people.

Deepak Tikku: In India, we have a population of over 1 billion, about 200

million households. About 140 or 150 million households are in rural areas, and 50% of these — about 70 million households — have milch animals, one to three per household. Our milk production, which was stagnating in the ’70s [at] around 20 million tons, is currently 112 million tons. This makes India the largest milk producer in the world. Also, the rate of growth of milk production in India over the last 20-30 years has been much faster than the rate of the population growth, with the result that the per capita consumption, which in the ’80s was about 4 kilograms a year, is now around 100 kilograms a year.

All this has been achieved through a program named Operation Flood. This program targeted cooperatives. Currently we have 14 million smallholders in about 140,000 villages, federated to about 170 district unions, which themselves are federated to about 24 cooperatives at the state level. About 30 million kilograms of milk every day [are] processed over 150 plants and marketed all over India and also exported. Thousands of technicians in the cooperative network conduct artificial inseminations and give health services. We

have also capacity-building programs for the smallholder farmers. In the last decade, over 100,000 farmers, 1,500 board of directors of the farmers’ cooperatives, and about 40,000 employees have been trained. It is necessary to see that, apart from collecting milk and connecting it to the market, you should also give all the technical services required for the small farmer.

In India, milk is the largest agriculture commodity and generates about \$50 billion at the farm gate, more than the value of rice and meat. Studies have shown in India that the Gini coefficient for livestock is around .15 compared to around .45 for [crop] agriculture, which means that income distribution from dairy is much [more] inclusive.

Thad Simons: It’s very important, in terms of optimizing livestock production, to have good nutrition for the animals. It achieves three roles of sustainability — to have an economic return to the farmer, because we can more efficiently feed the animals; it improves the environment, because there’s less waste coming out; and it also improves health.

A small example of something we did.



CARLOS SERÉ
Director General, International Livestock Research Institute



THAD SIMONS
President, Novus International



DEEPAK TIKKU
Chairman, National Dairy Development Board Dairy Services

[October 8] was World Egg Day. In terms of health and nutrition in human diets, one of the best ways of getting additional protein at affordable cost into human diet, is through eggs. As a company we put together educational materials, and working in collaboration with the Kenya Poultry Farmers Association, the Association of Kenya Feeds Manufacturers, the Morocco Poultry Federation, the Poultry Association of Lagos State Nigeria, and the Poultry Association of Ogun State Nigeria, we were able to put forward these materials. It's important in terms of human nutrition, especially for mothers and young children – it's very important for brain development.

We're very far away from that consumer, but we are able to work with the local producers for them to build awareness. We talk about export and open trade and these kinds of things — but a lot of the importance of livestock production is addressing the nutritional needs of people in country and in the region, really helping them to be as effective as they can in terms of sustainable livestock production.

Carlos Seré: Livestock is like putting a second floor on your farm — you're

producing crops, but then you're turning it into something people want and pay for. You have milk, eggs, meat; poor people can produce [them] just with labor and crop byproducts, grass grown along the road, etc. When prices go down, these people continue milking their cows.

Animal traction [is] very important. There are huge volumes of diesel oil which animals are replacing with renewable energy – grass. We're having lots of issues around water; people are talking about hundreds of thousands of liters of water for a kilo weight gain. Yes, if you use irrigated alfalfa in a feedlot, that's the case. But if you're feeding stubbles from sorghum or maize, ground nut hulls – those would happen with or without livestock, so the marginal contribution of animals to that water balance is very limited. The same applies to carbon. If we feed [cows] better, we can reduce the amount of CO2 and methane produced per kilo of milk dramatically.

We need to double production of food. It has to come from developing countries themselves, but the discussion is always on the crop side. People just look at yields, talk about grain. But for the farmer, the

total value of the plant is important. In India, people are moving stover over 400 kilometers to bring it to the peri-urban areas to feed buffalo, generally owned by women, who are then milking these buffalo. Over the years, the relative price of the grain versus the stover of sorghum – the stover has increased in value. So as biomass is getting more scarce, this is more and more important for income. If you want good nutrition, particularly women, they need income, and livestock allows even for landless people to get an income.

The problem is that livestock systems are very close-knit, particularly livestock systems of the poor. Breaking into those systems and intensifying them requires a lot of different interventions at the same time. You need health inputs, fertilizer, seeds, insemination, you need a market for a perishable commodity. How do you deliver that, cost effectively, to people with one, two, three buffalo?

Nowadays we've got all sorts of arrangements: the private sector purchasing directly from contract farmers, producer organizations, cooperatives. But we need to aggregate producers — only then do they

become a subject of commercial interest to the private sector.

We normally think of replacing smallholders through large commercial operations, and in sectors like poultry, it makes sense where there are significant economies of scale. But in other areas, there aren't, and the opportunity is to combine the entrepreneurship of the farmers. Instead of thinking about replacing the sector, we need to get the private sector to do business with them, to give them income. This is huge potential, but it takes a lot of new, imaginative thinking in terms of distribution [and] delivery.

Pell: We've got people who are worried about nutrient cycling.

Seré: Intrinsically crop/livestock systems are very good at this – manure stays on the farm. Smallholder systems are quite efficient in that sense. The movement of straw from rural to urban areas definitely will imply nutrient transfer. If you import food and distribute it back to the rural areas, you may have some flowing in the other direction. Surplus areas and deficit areas need to be connected.

Tikku: There are a lot of technologies

that are being developed. In cattle feeds, there are now bypass proteins, and there are experiments going on even for bypass fat. Animal nutrition is a very important component, especially in countries like India where the cost of milk production is contributed 70% by the feed and fodder. Grain fodder is also important, and we have to enrich the crop residues we have with various technologies.

Peacock: The anti-livestock lobby is growing in the North and has great potential to do a lot of damage to livestock keepers in the South. Having said that, we need to get our act together and look quite critically at the systems that exist to reduce the environmental impact. There are hotspots of environmental damage in the Amazon and feedlots in North America and a growing problem in Southeast Asia, in much more intensive systems. But I would not like poor livestock keepers who use, relatively, very low input systems, to see their life chances prejudiced – by Northern prejudice, essentially.

I would like to see investment to develop the kinds of business models that Carlos was talking about and elevate the

standard of service delivery to farmers. There are significant issues of quality of drugs, vaccines, and inputs going into the livestock sector in unregulated, weakly regulated markets. This has great impact on the performance of livestock systems and actual returns that farmers are getting on their labor. In some cases the incidence of poor quality drugs can be as high as 60-70%.

Tikku: The most important thing, if you want to develop the smallholder, would be an appropriate institutional structure which can connect the producer to the market and also connect him to the service producers who can give him breeding services, nutrition services and veterinary care.

Simons: Farmers in emerging markets are paying way over world prices for very poor quality. So something more in terms of standards and investments – because when you're there on the ground, you find that inputs are very expensive and hard to come by, and the farmers are not really getting the value of what they're paying for.

A lot of work needs to be done in aquaculture in terms of efficiency of production, how much meat we can get for a kilo of feed. This is where the most efficiency is going to be available. Trying to feed the world and doubling food production, we need to think in terms of the work that has to be done at small-scale, teaching small farmers and building structures around that. A lot of good work has been done around dairy; but very little work has been done in terms of other species.

Seré: The question of efficiency is central. How do we manage nutrient cycles much more efficiently? How do we avoid the environmental negatives? How do we intensify? How do we combine it, for example, with trees, which can sequester carbon in those systems and can provide dry-season feeding? So the whole issue of intensification.

Pell: I think probably the very most appropriate way to end this session is to end with the voice of the farmer.

Lor: Last week I visited a beef farm in Minnesota, and I found a big difference between our countries, because he has the big farm; in my country we have these individual farms, small farm. We have many challenges for my family, for my village, for livestock production. Some people don't trust vaccination, so that's a challenge for us to overcome. Also, we don't have enough of the grass because in the dry season, because of drought, and we are thinking how to have more food for our animals in the dry season. ■



WORLD FOOD PRIZE LAUREATE AWARD CEREMONY

*Left to Right Front: M.S. Swaminathan, Jo Luck, David Beckmann, John Ruan III
Left to Right Back: Amb. Kenneth M. Quinn, Gov. Chet Culver*



DAVID BECKMANN

2010 World Food Prize Laureate and President of Bread for the World

“I believe in God and when I look at the progress the world has made against hunger and poverty, I do think this is God moving in our time, answering the prayers of hundreds of millions of people.”

In honoring Jo Luck and me, this year’s World Food Prize honors millions of people all over the world who get together in voluntary associations of all different kinds to reduce hunger and poverty. Farmers in poor countries, people in our country.

I do think that the binding constraint on our progress against hunger and poverty is weak political will. I am really grateful to the elected officials who are here tonight, and I am also grateful for all the good citizens who make it their business to help our elected officials remember hungry and poor people.

Bread for the World members are

celebrating right now, not just because of The World Food Prize, but because our government’s doing some good things for hungry and poor people. The president and Congress, both Republicans and Democrats, have launched an international effort to invest more in poor farmers and malnourished babies in the poorer countries of the world. Just recently, the president issued a directive that will make our foreign aid more effective in reducing hunger and poverty. That would not have happened without persistent advocacy by Bread for the World members across the country.

Everybody who is here is a leader in the world struggle to overcome hunger. And

everybody who is watching us can make a difference.

I believe in God and when I look at the progress the world has made against hunger and poverty, I do think this is God moving in our time, answering the prayers of hundreds of millions of people. We have very clear opportunities to get our own government and other governments to do some things that will help people who are now hungry work their way out of hunger. That’s why it seems to me that God is calling us. Right now. To change the politics of hunger. ■



JO LUCK

2010 World Food Prize Laureate and President of Heifer International

“We’re deeply committed to assuring there’s food security for all people but in a healthy, accessible, just and sustainable manner.”

Thank you so much. This is a magnificent venue, magnificent people and a great honor.

I’d like to say to those laureates preceding me, and my dear friend and co-recipient, David Beckmann, and to all of you who are here tonight and others around the world, we’re deeply committed to assuring there’s food security for all people but in a healthy, accessible, just and sustainable manner. I am proud to stand among you.

To the Heifer team members here tonight and all of the rest of our team that circle this world, you have taught me so much and shared my passion that we could make

a lasting difference.

For my family, represented tonight by my daughter Beth and my son Mark, thank you for loving me enough to support me in my dream to make a lasting difference, even when it meant we were often on the other side of the world from each other for a significant amount of time.

To Norman Borlaug, who inspires all of us and who wisely said in his last words, “Take it to the farmer,” if I could ask him tonight, I’d ask his permission if we could also add to that, “Listen to the farmer.”

And I cannot stop or close this tonight without saying, Ambassador Quinn, The World Food Prize, amazing team and your

distinguished advisory council, I am so honored to be a part of your family.

And the very final comment I have to say, I’m humbly accepting this award on behalf of the farmers, the smallholder farmers all around the world who are thinking of us and celebrating, and the majority of them are women. They feel so validated by you, so recognized, so refreshed in their self-confidence, and I would like to say if I were strong enough and could pick that sculpture up, this one tonight is for the farmers! ■



DAVID BECKMANN, 2010 WORLD FOOD PRIZE LAUREATE AND PRESIDENT OF BREAD FOR THE WORLD, VISITS A VILLAGE IN MOZAMBIQUE.



DAVID BECKMANN SPEAKS DURING THE WORLD FOOD PRIZE PUBLIC FORUM. HE IS SHOWN WITH MODERATOR ROGER THUROW AND JO LUCK.

2010 LAUREATE LECTURE

David Beckmann

Now is the time to change the politics of hunger. I want to talk about three really good things that the U.S. government has recently decided to do for hungry people around the world.

Feed the Future is the U.S. initiative to promote agriculture and improve child nutrition in poor countries around the world. The part of Feed the Future that I like the most is that the U.S. government is using its influence with other governments, corporations, and civil society to mobilize an international effort to invest more in poor farmers around the world and, specifically, in things that will reduce malnutrition among babies. That's a brilliant move.

It's not just administering \$1 billion a year — it's also the Secretary of State and the President of the United States leaning on

other governments to say, "World hunger is a problem that we've got to deal with; world hunger has increased. The price increases in agriculture give us a chance to reduce world hunger in a durable way by investing in agriculture." So the G-8 governments have made substantial commitments. And they're going to developing-country governments and saying, "We want to invest in agriculture in countries where the government is also investing, in a smart way, in its own farmers."

Let me make it clear. This is not just Hillary Clinton and Barack Obama doing this; Congress has also been very supportive, Republicans and Democrats. It really is the whole U.S. government reaching out to poor farmers around the world.

I want to flag a small component of Feed the Future, focused on malnourished

babies, called the 1,000 Days campaign.

You can summarize it in six sentences. First, focus on the first 1,000 days of life, from conception to 2. Second, you can do a lot by teaching poor parents good nutrition habits — things like breastfeeding and the importance of washing your hands with soap. Third, help poor communities set up a system so that they can identify and get fortified foods, like Plumpy'nut, to severely undernourished kids. Find ways to get key vitamins and minerals to those babies, especially iodine, [vitamin] A, zinc. Pay attention to nutrition in broader programs to develop agriculture. There are different kinds of agriculture and we want the kind that's going to reduce malnutrition among children. Finally, allow local people to plan the program. These ideas are great ideas at a global scale, but when you get to a

particular country or community, you may need to adapt to what will work there.

The third thing our government is doing is reforming U.S. foreign assistance to make our foreign-assistance program and related policies more effective in reducing poverty and hunger. Let's have a coordinated program, a strong lead agency, monitoring and evaluation, less earmarking so that you can be responsive to local people. The emphasis on agriculture is part of a broader re-emphasis on sustainable, inclusive, economic growth that reduces poverty over the long haul.

[In September] President Obama issued a directive to all the agencies of the federal government, a new policy to promote global development.

It is the first time that our government has had a coherent policy since John Kennedy. It really came from Bread for the World and many other private groups, non-governmental organizations that care about hunger, poverty [and] development. We pushed and managed to get legislation moving in both the House and the Senate;

that, then, provided the momentum that made it possible for the State Department and the White House to go through major policy processes that culminated in the President of the United States giving a global development policy to our government.

There are a couple of things that need to be done in Congress starting now. We need to get the money.

This is not a lot of money; development assistance is about 1% of the federal budget. President Bush asked for increases in development assistance because he believed it was the right thing to do; it was important to U.S. national security, the U.S. economy. President Obama is also asking for increases in development assistance, and much of that increase is for agriculture and nutrition. And Congress is not now on track to provide all of the money that he has requested for next year. This year, the United States spent twice as much on agricultural development in poor countries as we did in the prior year.

We need to encourage Congress to

provide all of the money that the President requested to reduce poverty and hunger in the developing countries. If Congress does not provide the money he's requested, we will not feel so ebullient about all the change happening in the world. The President's ability to move the rest of the world will be undercut. If he goes back to the G-8 next summer and he hasn't been able to raise the money that he committed, how do we expect that the Germans and the French and the Spaniards and the rest are going to come up with the money that they committed?

Next year, we have a chance to get legislation that will reform foreign assistance not just for one administration — what we need, in order to make our foreign aid more effective for the next 20-30 years, is bipartisan agreement on legislation that will give foreign-aid reform the force of law. We need to get [Congress] working together, to use our foreign aid dollars better to help hungry people; that's what it's about. ■



JO LUCK VISITS A HEIFER INTERNATIONAL SITE IN ROMANIA. COMMUNITY MEMBERS RECEIVE TRAINING AND LIVESTOCK TO IMPROVE THEIR LIVES.



JOHN RUAN III, CHAIRMAN OF THE WORLD FOOD PRIZE AND AMB. KENNETH M. QUINN, PRESIDENT OF THE WORLD FOOD PRIZE, AWARDED A LAUREATE CERTIFICATE TO JO LUCK, 2010 WORLD FOOD PRIZE LAUREATE AND PRESIDENT OF HEIFER INTERNATIONAL.

2010 LAUREATE LECTURE

Jo Luck

Heifer has moved into advocacy. We're 66 years old, but for many years we did not approach that. We were working with villages, communities and with people on the ground.

In the very beginning there wasn't really interest in the government because they were so focused on the farmers. As we've grown and learned, we know you're never going to make a significant impact until you really do influence the decision-makers as well.

We are working all over the world. Right now we are advocates for smallholder farmers and women to be empowered around the world. There are other ways we influence as well. We live the examples of success. We hire only the indigenous people

— they know what is and isn't working, the government knows them and everybody respects it.

I'll give you two examples of great success. Roughly 14 years ago, a gentleman received rabbits in China. We work with 30 species because we do have to find what's appropriate for the environment and the community has to decide what their resources are, what they can support and what their real needs are. This gentleman, over that period of time became a millionaire by U.S. standards. He goes back and every year does the same for 250 more families.

He didn't forget where he came from. He's brought in water, roads, and we all know how important roads are.

While not everyone can be a millionaire, a

smallholder farmer with the right resources and training is going to be an entrepreneur and can still be a great success.

We're working in East Africa, in Uganda, Rwanda and Kenya to see how we can empower them to come together. They buy their own cooling plants, or they get a loan and pay it back. This is not giving — they're doing and earning.

When I was in Thailand, I spoke to an old woman in the field and just working her heart out. She came over to the side to take a break and through the interpreter I asked her, "Why do you work so hard out there. You're the senior member of the family. You have a lot of people here working."

She said, "Let me tell you something. We all have to do this and work together, because it takes so much time. And here's

the thing — if I die my family will miss me terribly, but if this water buffalo dies, they lose all their hope, future and success and means of income." She understood the truth. And that's what agriculture and animal agriculture do.

The reason Heifer is successful — and the reason I'm drawn there and been kept there is because they have learned so much over 66 years. All our country directors are more educated than I am. They have their doctorates — and that's the way I like it because it makes their boss look good. But it is important to bring them to the table and hear them.

We ended up developing the 12 cornerstones based on the core values of what we do. We say there has to be full participation, gender equity, family focused, accountability, genuine need and justice, caring for the earth, better animal management, integration of crops and more important values.

And every time we look at something in a project and evaluate it, that

“While not everyone can be a millionaire, a smallholder farmer with the right resources and training is going to be an entrepreneur and can still be a great success.”

is considered. And the people on the ground organize, make the decisions and monitor it. We are there to help them and support them, but they make those decisions.

That's why in the Andes they're re-introducing alpaca, the llama and the guinea pig in the highlands; it's the only place they have space to have their protein.

So that is the approach because it has turned into a development model that

has been adopted. The World Bank once even asked us to come into a place where something wasn't sustainable and work with them.

But I want you to know that is the real approach and the secret of sustainability. And so my dream, after winning this great honor — I represent the farmers by receiving it for them — is that we are going to get more exposed now to not only the great advocacy organizations but corporate support and interest — agribusiness.

For years the little farmer and the agribusiness were kind of at odds. They don't need to be. They don't have to agree on everything, but they need to take the best from each other, and know the impact of whatever they need to do.

I've been hearing a lot of great things about the importance of the small farmer in ending hunger, and certainly that's not the only way to do it. But we need to come together. ■



IOWA STATE CAPITOL ROTUNDA
2010 World Food Prize Laureate Award Ceremony

LAUREATE AWARD CEREMONY



LOCAL STUDENTS

from Southeast Polk High School's marching band welcome guests to the 2010 Laureate Award Ceremony.



THE 2010 LAUREATE AWARD CEREMONY

begins as trumpeters sound the World Food Prize fanfare.



THE IOWA STATE CAPITOL

offers a majestic venue for both the World Food Prize Laureate Award Ceremony and dinner.



U.S. SECRETARY OF AGRICULTURE TOM VILSACK

announces the new Wallace-Carver Internship Program, a partnership between the USDA and the World Food Prize.

LAUREATE AWARD CEREMONY *continued*



THE 2010 BORLAUG-RUAN INTERN AWARD WINNERS
from Left to Right: Danika Schaaf, Joe-Ann Moser, Allison Zhao and Lauren Schefer.



CAROL MONTAG
performs in honor of the late World Food Prize chairman emeritus, John Ruan, Sr.



ELEASHA GAMBLE
performs in honor of Laureate David Beckmann.



THE PHILANDER SMITH CHOIR
performs in honor of Laureate Jo Luck.

In 2009-2010, Iowans made a significant impact in the fight against hunger. In the past year, Iowans:

- donated at least \$9.38 million.
- distributed 18.6 million pounds of food.
- volunteered 540,000 hours.

When President Bush appointed me ambassador, he said to me two things. He says, "I want you to feed the world, and I want you to bring hope to the hungry."

And I looked at him and it got real quiet. I said, "Is that all?"

What's the problem? Well, I think you know the problems as well as I do. You've heard about them and will continue to hear more about them this week. More than two billion people in the world today make less than two dollars a day, and one billion people make a dollar a day, and 25,000 people will die before the day is up — and they'll die of hunger, and they'll die of hunger-related diseases.

Forty-nine million people in America are living at risk of hunger today in our own country. How can that be? Hunger, both domestically and abroad is fundamentally a condition of public and political will. It's not a question of know-how of — we don't know what to do. We know what to do, and we know what it'll cost. Hunger persists because, I think, we lack the leadership and the collective will to end it.

Everybody's got a role to play.

I'll just finish [with]this one story about Mother Teresa. A reporter asked her, "Don't you think that what you do is a drop in the bucket?"

She said, "No. What I do is a drop in the ocean, but if I didn't do it, it'd be one less drop." Can you imagine in this room with what you're doing here with the World Food Prize, the drops, the impact that you're having just not only this city but on this state? It's wonderful.

I'm glad to be part of it and glad to be with you, and congratulations on a great week. ■



AMBASSADOR TONY HALL

Director of the Alliance to End Hunger gives the keynote address at the Iowa Hunger Summit

IOWA HUNGER SUMMIT



LOCAL STUDENTS
attend the Iowa Hunger Summit.



WORKSHOPS
by organizations including ONE attract attendees.



MEALS THAT HELP FIGHT HUNGER
are served at the Iowa Hunger Summit luncheon.



PUBLIC PARTICIPATION
is a central part of the Iowa Hunger Summit conference.



SPEAKERS
such as Max Finberg of USDA share their expertise.



FARMERS FROM AROUND THE WORLD
participate in the discussions and offer their perspective.

HUNGER SUMMIT SPONSORSHIP ANNOUNCED



FARM BUREAU ANNOUNCED A SPONSORSHIP OF THE IOWA HUNGER SUMMIT FOR THE NEXT FIVE YEARS AND PRESENTED A \$150,000 CHECK TOWARD THE NORMAN E. BORLAUG HALL OF LAUREATES. PICTURED HERE ARE JIM HOHMANN, KENNETH QUINN AND CRAIG LANG.

FBL Financial Group and the Iowa Farm Bureau Federation announced during the 2010 Iowa Hunger Summit their sponsorship of the event for the next five years. With aims to enhance public attention to both causes of and solutions to hunger, the sponsorship will allow the Iowa Hunger Summit to continue to celebrate and encourage increased action and partnership among Iowans to solve issues related to hunger, poverty and malnutrition.

“The issue of hunger is about so much more than food,” said Jim Hohmann, FBL Financial Group’s Chief Executive Officer. “It’s about having choices. It’s about dignity and self-reliance. It goes beyond sustaining life and into quality of life. Ensuring the people of our communities have an available food supply – access to food when they need it – is essential, and that’s why we’ve come together with a common commitment to making a difference today.”

“Modern agriculture puts Iowa in a unique position for sustaining a healthy supply of food and energy for us all,” said Craig Lang, IFBF President and fifth generation Iowa dairy farmer. “Farm Bureau leaders have hosted farmers and scientists from all over the world including Russia, China, Africa and India; they view the modern Iowa farmer as role models; we view our work as a calling – not just to feed our families, but our neighbors across the fence and around the world. That is why Iowa Farm Bureau farmers are proud to support the Iowa Hunger Summit.” ■

SIDE EVENTS



**WORLDWATCH INSTITUTE:
STATE OF THE WORLD 2011**
Nourishing the Planet



AMERICAN FARM BUREAU FEDERATION
signs an official agreement with its Russian counterpart, AKKOR.



WORLD ECONOMIC FORUM
participants discussed current issues and collaborated in small groups during the event.



USAID
Board for International Food and Agricultural Development



**USDA FOREIGN AGRICULTURE
SERVICE SEMINAR**
Smallholder Farmers and the Private Sector



**PARTNERSHIP TO CUT HUNGER
AND POVERTY IN AFRICA**
Expanding Commitments to Agricultural Development and Food Security



CROPLIFE/CAST
Communication Award honors Dr. Akin Adesina of the Alliance for a Green Revolution in Africa.



**TRUTH ABOUT TRADE AND
TECHNOLOGY**
The New Politics of Food and Farming



WORLD FOOD PRIZE GLOBAL YOUTH INSTITUTE
Students gather in front of the Capitol building.

“Youth Institute participants are leaders for tomorrow, not just at home but in developing countries as well.”

- Norman Borlaug

Dr. Norman Borlaug and John Ruan shared the dream that one day, the World Food Prize Global Youth Institute would bring high school students from across America and abroad to Iowa every October to interact with World Food Prize Laureates and international experts, and be inspired to develop their own innovative careers.

In 2010, over 100 students gathered from 16 states and 6 countries - including Afghanistan, Kosovo, Mexico, Montenegro, South Korea and Ukraine - to present papers they researched on critical aspects of food security, and discuss their findings with global leaders in science, industry and policy, as well as with their peers, in roundtable discussions.

In addition, the students attended several World Food Prize events and lectures, packaged over 23,000 meals bound for Haiti through the Kids Care International Outreach program, and visited Kemira Industries for a short campus tour and to do hands-on DNA extraction on strawberries.

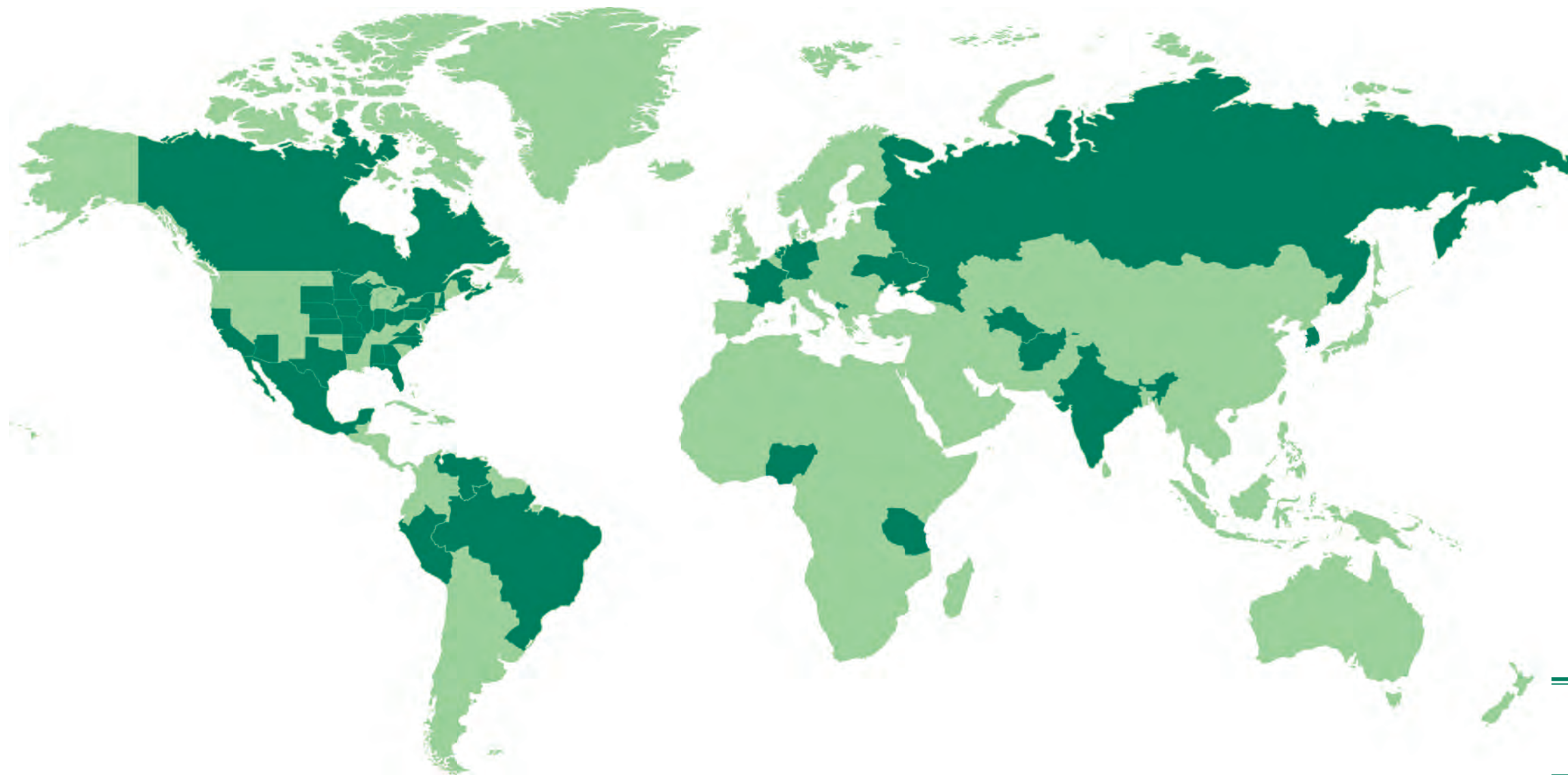
Sixteen of these students will be selected to spend the summer abroad on eight-week internships at acclaimed agricultural research centers around the globe through the Borlaug-Ruan International Internship Program.

With generous support from Clay Mathile, the chairman of the Mathile Institute and a longtime supporter of Dr. Borlaug's efforts to spread the Green Revolution around the globe, the World Food Prize Foundation continues to successfully expand and strengthen its youth programs across the country. ■

THE WORLD FOOD PRIZE

Global Youth Institute

The World Food Prize Global Youth Institute began in 1994 as an interactive learning experience for Iowa students, to engage them in real-world science, agricultural and development issues. Over the past 16 years, it has grown immensely, attracting over 1,100 students from 26 states and 19 countries, and we continue to expand the program. Educators also accompany the students and work with them on essays and research; nearly 500 teachers have attended the events.



GLOBAL
MAP

ACTIVE
PARTICIPANTS

GLOBAL YOUTH INSTITUTE PARTICIPANTS
(1994-2010)

UNITED STATES

STATE	STUDENTS	EDUCATORS
Alabama	1	1
Arkansas	2	2
Arizona	2	2
California	4	4
District of Columbia	12	3
Delaware	4	4
Florida	3	2
Georgia	1	1
Illinois	19	4
Indiana	10	8
Iowa	851	358
Kansas	2	1
Massachusetts	1	1
Minnesota	25	13
Missouri	1	1
Nebraska	20	18
New Hampshire	2	3
New Jersey	1	2
New York	10	6
North Carolina	2	2
Ohio	32	20
Pennsylvania	7	4
South Dakota	7	3
Texas	11	9
Virginia	2	1
Wisconsin	7	3
TOTAL	1039	476

INTERNATIONAL

International students attending the events have come from Afghanistan, Brazil, Canada, France, Germany, India, Kosovo, Mexico, Montenegro, Netherlands, Nigeria, Peru, Russia, South Korea, Tanzania, Turkmenistan, Ukraine and Venezuela.

COUNTRIES	STUDENTS	EDUCATORS
All mentioned above	63	9

GRAND TOTAL*	STUDENTS	EDUCATORS
U.S. & International	1102	485

* Participants who attended multiple times were only counted once

GLOBAL YOUTH INSTITUTE



DR. M.S. SWAMINATHAN
1987 World Food Prize Laureate talks with a Borlaug-Ruan International Intern who studied in India.



DAVID BECKMANN
2010 World Food Prize Laureate works with students.



STUDENTS OFFER SOLUTIONS
for current food security challenges.



BORLAUG-RUAN INTERNS
present their experiences abroad to John and Janis Ruan and other participants and visitors.



DR. GURDEV KHUSH
1996 World Food Prize Laureate works with students.



TOM VILSACK
U.S. Secretary of Agriculture speaks to Borlaug-Ruan International Interns about a new partnership with the Global Youth Institute, extending an internship opportunity with USDA.

USDA ANNOUNCEMENT: SECRETARY TOM VILSACK

In the USDA office that I am proud to call my office as Secretary of Agriculture, there is a large black and white photograph. It is a photograph of two other giants. We've talked about a number of them tonight, the giants of John Ruan and Norman Borlaug. But Henry Wallace was the Secretary of Agriculture and Vice President of the United States, the founder of Pioneer seed company, a man that I think all of us recognize as a giant in agriculture, a believer in science. And the picture I have of Henry Wallace is of him talking to George Washington Carver, who was another great American and someone who was committed to agriculture and agricultural research. Those two have an Iowa connection because George Washington Carver received his formal college education experience in Iowa and spent a good deal of time in his early life at Iowa State University.

Whether it's Norman Borlaug, John Ruan, Henry Wallace or George Washington

Carver, in addition to the passion that they had for agriculture, they also believed in the greatness of youth and young people. The World Food Prize has carried on that inspiration with the establishment of the Global Youth Institute.

I think there's an opportunity for a partnership between the United States Department of Agriculture and the Global Youth Institute. So tonight I'm happy to announce the creation and establishment of the Wallace Carver Internship Program.

Beginning this year, USDA will invite 120 students who attend the World Food Prize symposium through the Global Youth Institute to join us for an internship at USDA. We'll work with these students to match their interests and the appropriate location and part of USDA. In addition to offering an internship, we also recognize the 16 young people who were recognized earlier tonight who are selected each year as the Borlaug-Ruan International Interns. We wish to extend to this class of interns,

as the first class, an invitation to come to Washington, D.C. to spend a week with us at USDA for discussions and presentations on a variety of key issues related to food, agriculture and natural resource policy.

And finally, as part of this effort we also look forward over the course of the next year to expanding our partnership with The World Food Prize even further. With the help of our land grant universities, the 4-H and FFA, USDA will offer internship opportunities to an additional five individuals from each and every state in this great nation, who are currently in high school, for an internship opportunity with USDA in their respective states.

This is an opportunity for us to continue the great tradition that The World Food Prize has started with their Youth Institute and to continue to support the memory of Norman Borlaug, John Ruan, Henry Wallace and George Washington Carver. ■

ANNUAL PROGRAM SPONSORS

The Governor and The State Legislature of Iowa • Iowa Department of Economic Development

The Bill & Melinda Gates Foundation • John Deere Foundation • The John Ruan Foundation Trust • Mathile Institute • Monsanto • Pioneer Hi-Bred • Ruan Transportation Management Systems

Archer Daniels Midland Company • Bankers Trust • Cargill • Faegre & Benson • FMC Corporation • General Mills • Hy-Vee • Iowa Corn Growers Association • Iowa Farm Bureau/FBL Financial Services • Iowa Soybean Association • Kemin Industries • Land O' Lakes • Novus International • PepsiCo • Principal Financial Group Foundation • Soyfoods Council • Syngenta • United Soybean Board • USDA – Agricultural Research Service • Wallace Genetic Foundation • Walmart • West Central • The Whitaker Group • World Soy Foundation • Donna Young

Elanco • Denny Elwell Company • Humanities Iowa • Nationwide Agribusiness • Arthur Neis • Prairie Meadows • Willis Cadillac

Alliance to End Hunger • Boesen the Florist • Maryanna Destro & John Woog • Jane Chase • EMC Insurance Companies • Karen and Bill Hess • John and Mary Ann Hicks • Carole and Jeff Hix • International Traders of Iowa • Iowa Savings Bank • Iowa Scottish Rite Masonic Foundation • Iowa State Education Association • Iowa State Bank • Sam and Lori Kalainov • Merchant Investments • Margaret and Tom Mehl • Raccoon Valley Bank • Riley Memorial Foundation • Suku and Mary Radia • Sukup Manufacturing • William Van Orsdel • Bernice Vlahakos • Martin Walsh

HALL OF LAUREATES DONORS

John Ruan Trust • Polk County • Monsanto

DuPont/Pioneer Hi-Bred • The Howard G. Buffett Foundation • Institute of Museum and Library Services • Vision Iowa

Archer Daniels Midland Company • Bankers Trust • The Bill & Melinda Gates Foundation • Bridgestone Firestone • Bunge • Gregory Burt & Suzie Glazer-Burt • Cargill • W.T. & Edna M. Dahl Trust • Greater Des Moines Community Foundation • Helen & James Hubbell Family Foundation • Iowa Corn Growers Association • Iowa Farm Bureau/FBL Financial Services • Iowa Office of Energy Independence • Iowa Pork Foundation • Iowa Soybean Association • Kemin Industries • Nationwide Mutual Insurance Company • RW & Mary Nelson • Chris & Linda Nelson • Owen Newlin • Prairie Meadows • Principal Financial Group • Rotary Club of Des Moines • Save America's Treasures • Sehgal Foundation • State Historical Society of Iowa • United Soybean Board • West Central

Belin Law Firm • Don & Margo Blumenthal • Bravo Greater Des Moines • Jerry & Sue Chicoine • City of Des Moines • Jim & Patty Cownie • Des Moines Founders Garden Club • Essex Meadows • Humanities Iowa • Hy-Vee • Iowa Savings Bank • W.K. Kellogg Foundation • Gerald Kirke • Tom & Linda Koehn • Don Lamberti • Land O' Lakes • James O'Halloran Jr. • Jim & Jeanne O'Halloran • O'Halloran International Foundation • John Pappajohn • Rain & Hail Insurance • Stanley & Jody Reynolds • The John Ruan Foundation Trust • John & Janis Ruan • O. Jay Tomson • Wild Rose Entertainment • Windsor Charitable Foundation

Frank Berlin & Associates • J.C. Brenton Foundation • Steve & Melissa Chapman • Denny Elwell Company • Des Moines Garden Club • Michael Duffy • Ronald & Barbara Eckoff • Brad and Kelly Edmister • David Fisher • Edgar & Phyllis Hansell • Donald Ray Hartline Trust • David & Elizabeth Hoak • David & Barbara Hurd • Iowa Council for the Social Studies • Sam & Lori Kalainov • Elizabeth Kruidenier • Bill & Kristi Lozier • Landis & Sharon Martin • Richard & LaDonna Matthes • Tom & Margaret Mehl • Russell Melby • Phil & Sue Nelson • Onthank Company • PEO • Per Mar Security • Questers - Circa 64 • Questers - Grant Wood • Questers - Hubbell Terrace Hill • Kenneth & Le Son Quinn • Peter & Mary Ann Reiter • Tracy Rosenberg • Craig & Elizabeth Sandahl • Thomas & Linda Schaefer • Mark & Cindy Snell • Jeffrey & Kathleen Stahl • Jan Miller Straub • Mark Thomson • William Vernon & The Vernon Company • Marvin Walter • Fred & Emily Weitz • John & Kathy Williams • Donna Young



NORMAN E. BORLAUG HALL OF LAUREATES

Grand Opening Scheduled for October 2011

LOOKING TO THE FUTURE A new home for The World Food Prize

The World Food Prize will celebrate its 25th anniversary with the Grand Opening of its new headquarters in October 2011. As a special tribute to Dr. Norman Borlaug, and to provide an enduring foundation for all of the programs he created, the World Food Prize is restoring and renovating the century-old Des Moines Public Library Building as the Dr. Norman E. Borlaug Hall of Laureates.

Thanks to the critical lead donation by the John Ruan family and the support of generous private and public donors, this \$29.8 million project will serve as: a museum to recognize great achievements in agriculture; a convocation center at which to hold events during the World Food Prize International Symposium; a home for the expanded Global Youth Institute; and an educational facility featuring interactive displays on hunger and food security. ■



WITH GEOTHERMAL HEATING AND COOLING, SOLAR PANELS AND A CISTERN TO CATCH RUNOFF RAINWATER, THE NORMAN E. BORLAUG HALL OF LAUREATES IS DESIGNED TO ACHIEVE LEED PLATINUM CERTIFICATION, THE HIGHEST POSSIBLE LEVEL OF ENERGY EFFICIENCY.

2011 BORLAUG DIALOGUE

“The Next Generation”

October 12-14, 2011



Norman Borlaug created The World Food Prize to recognize breakthrough achievements in improving the quality, quantity and availability of food in the world and to inspire new ones. Join us in October 2011 as we celebrate his legacy and our 25th Anniversary by looking ahead to future leaders, challenges and technologies in the struggle to reduce hunger and poverty in the world.

Learn more at
www.worldfoodprize.org



THE WORLD
FOOD PRIZE