

**CEO ROUNDTABLE: THE ROLE OF THE PRIVATE SECTOR IN SUSTAINABLE  
AGRICULTURAL DEVELOPMENT**  
**October 12, 2011 - 1:15 p.m.**

**Richard Leach- President and CEO, World Food Program USA (Moderator)**

Thank you very much, Ken. I think it's amazing what Ambassador Ken Quinn has done with the World Food Prize. He has in fact made this the premier form for these issues. And I know that Norman Borlaug is proud and would really greatly respect the work that you've done. And perhaps the committee can think about giving one of the awards to Ken Quinn for his great work. What do you think?

I am truly humbled to actually be up here with this incredible panel. If I can, just to introduce everyone, and then we can begin. As with age, the requirements of different sets of glasses creep in. At least I can still see.

So if I may start with Patricia Woertz, who is chairman and chief executive officer of Archer Daniels Midland Company. Since joining ADM, Patricia has led the company to record financial results while growing its sourcing, transportation and processing networks. Under her leadership ADM has expanded its voice in global food security issues, including playing an essential role in creating the world economic forum's new vision for agriculture, and establishing the ADM Institute for the Prevention of Post-Harvest loss with a ten million dollar grant to the University of Illinois.

Next, Hugh Grant is chairman, president and CEO of Monsanto, an agriculture company focused on applying innovation and technology to help farmers increase yields while conserving natural resources. With Hugh's leadership, Monsanto seed brands and biotechnology products have established the company as a leader in the agriculture, seed and trade industry. Monsanto supports conservation efforts such as reduced tillage or no-till practices and pesticide reduction, as well as helps smallholder farmers increase their incomes.

Hugh has been with the company more than 30 years and has worked across the company and around the globe. He's a member of the American Academy of Arts and Scientists and also serves on the board of Crop Life International, the Donald Danforth Plant Science Center, the St. Louis Science Center, and Washington University in St. Louis.

Next, Sam Allen is chairman and chief executive officer of Deere & Co., a position he's held since February 2010. Sam joined the company in 1975, following his graduation from Purdue University with a degree in industrial management. Since that time, Sam has served in every major Deere division, including senior positions in construction and forestry, power systems, advanced technology and agricultural equipment. In addition, Sam chairs the Council on Competitiveness and is a member of the Whirlpool Corporation's board of directors.

Next, Jim Borel is executive vice president for DuPont and a member of the Company's office of the chief executive. He has responsibility for DuPont's agriculture and nutrition businesses, including Pioneer Hybrid, Crop Protection, Solae, Qualicon, and the food ingredients business of the recently acquired Danisco. Jim has been with DuPont for more than 30 years. Having been raised on an Iowa farm, probably not far from here, Jim has a lifelong passion for finding ways to improve agricultural productivity and addressing the global food security challenge. Next, and certainly not least but last on the panel here, a good friend, Dr. Namanga Ngongi, is president of the Alliance for a Green Revenue, also known as AGRA. He's a farmer from Cameroon who has a PhD from Cornell in agriculture. And before assuming the position of president of AGRA, Namanga was the deputy director of the World Food Program in Rome. He's dedicated his life to feeding the world and, as you'll see today, is a passionate spokesman for the Green Revolution in Africa.

So that's our incredible panel that we have here today. Just ground rules in terms of how we hope to conduct the panel, I'm going to pose an initial question, which every panelist will answer, but after that the hope is that we'll actually create a dialog; and panels don't need to wait to be acknowledged by the moderator but hopefully just engage in the discussion.

We have incredible, brilliant, committed people on stage here, and I'm hoping that we can have a discussion and in essence be the fly on the wall from a dinner conversation.

Earlier today the Global Harvest Initiative, of which the four companies represented here are the partners who created that initiative, released a report highlighting the challenge of feeding the nine billion people who are expected to inhabit the earth by 2050.

As Bill Leshner, the chairman of the Global Harvest Initiative, said, "The challenge is daunting." This is a challenge that will require not just public sector action but also private sector investment. And this panel is quite appropriate and the appropriate people to discuss these issues today.

So if we can, just to begin, to set the stage for the discussion what I'm hoping each of the panels can do is, in approximately two minutes or so, to help everyone understand, to briefly describe what you are currently doing to help meet this challenge and promote food security. And if we could just start with Patricia at the end there.

**Patricia Woertz- Chairman, CEO and President, Archer Daniels Midland Company**

Sure. Well, thank you, Rick. First of all, congratulations to Ken and Chairman Ruan on the 25<sup>th</sup> anniversary. It's an exciting time to be here, and we're thrilled to continue to be part of the World Food Prize - not only this event but its year-long activities.

The Global Harvest Initiative's GAP which was issued does indicate a need for continued investment, not only from the public sector but from the private sector associated with meeting the demands of a growing world and growing population.

At ADM, just describing what we're not - we're not like many of our colleagues on stage here at the beginning of the cycle of production, but we connect that harvest, once it is produced, to the

home or to the mouths that need fed – so the continuation of a chain, if you will. Anywhere crops are grown in the world, we have an opportunity to acquire those crops, to clean them, to store them, to transport them if needed to markets, to get the farmers’ rewards for that production, to invest in infrastructure that connects that production to the markets or homes that need the food or feed, animal feed or food, or even industrial products around the world.

We are major investors in global agriculture. We have spent between one and a half and two billion dollars per year in our investments to connect the harvest to the home, and this is in port facilities and storage and origination facilities, in processing or cleaning facilities, and in transportation, to get those crops or those food products to the market.

We think it’s important to think about a secure, reliable source of supply and an interconnected source of supply between again the farms and the markets. So the importance of capital investment as well a social investing – we invest in areas where we work and live, where our production facilities are, also to make that connection and to help those communities thrive.

ADM handles anywhere from 20 to 30 percent of crops globally – that’s corn, wheat, oil seed, cocoa – and in handling those crops, sometimes they reinforce and go directly to the local markets and reinforce those local communities where they’re grown. And other times that connection again is farther along the chain and farther away. I think it’s important to think about the interconnectivity of these global markets to enable the future, as we look forward to the next 50 years. Where crops are grown and where the population is growing needs to be more and more interconnected.

Lastly, we also have quite a few social investing programs going on, and I might just give you two quick examples.

In Ghana – and congratulations again to President Kufuor – but as you know, we’ve spent time with our cocoa farmers and producers in Ghana to be able to have active healthy and proactive agricultural practices programs so that those farmers can be both more productive and they and their families can be healthier – so forming vaccine clinics, health clinics, working with both our employees and the local producers and their families to expand that healthy family community well beyond the country of origin but also well beyond that to the markets that they serve.

Another example is in the prevention of post-harvest loss. It’s estimated that 20 percent of crops that are grown, and particularly in areas that don’t have strong infrastructure, are lost after the harvest. So this isn’t any new acreage we need to add. This isn’t any new technology but in fact finding ways to eliminate the post-harvest loss. So we’ve created an institute at the University of Illinois, which Rick mentioned, that will be connecting not only what we know in this country but particularly focus on India and Brazil to connect the loss prevention programs around the world. So we’re very excited about that as well.

### **Hugh Grant- President and CEO, Monsanto Company**

Monsanto is a seed company. We operate pretty much everywhere in the world there is agriculture. If you think of development projects, Rick, we would focus on improving the yield

of growers in their local farming environment. And our focus over the last few years is really across three buckets.

The first one would be research and development and sharing our research tools or sharing findings in our research and development in a local environment. And some examples of that would be in the collaborative work that we've done with the Gates Foundation, looking at drought-tolerant corn, so water-efficient maize for Africa. Another one would be insect tolerance, insect resistance in cowpeas, and virus resistance in cassava, so areas where our applications can be used in some of these local crops. So that would be the first area.

The second one is often more practical, more hands-on, and usually more difficult; and it's improving business models or helping with logistics or very often helping with advice. We have a project called SHARE going on in India where we're reaching out to thousands of Indian farmers and providing direct advice, often through cell phone contacts.

And then the third area would be education. Today I had a lunch with a really bright international group of Beachell Borlaug scholars. And this is a program that started a few years ago focusing on rice and wheat, which are very often areas that are underfunded in research and development – and looking at how we improve education and improve outreach for rice and wheat breeders going forward.

So as we've looked at these development projects, we've kind of concentrated in R&D business models and in education. And it's like everything else in agriculture – these are long-haul projects. You don't get into farming for next year. You look at farming for the long haul.

And I think the report today, when you look at the GAP report, a lot of these changes are going to span this generation and next. So I really like the fact that the theme of this conference is "Next Generation," because I think a lot of what we start today will literally be harvested in the future.

#### **Samuel Allen-Chairman and CEO, Deere & Co.**

---

Yeah, I think as we look at this issue – and you mentioned nine billion people – I think equally I mean, maybe even more so to heighten, is the fact that the report also says we have to double food output. And that's a compelling, compelling charge, especially when we think that the world doesn't have that much more arable land. So that means that output is going to have to increase on the land that's in existence today, and it has to be done in a sustainable fashion. And Deere really is attacking that problem at both ends, at the bookends. Clearly, the area that we're known for and are now almost 175 years, is high production agriculture. And certainly we continue to invest – in fact, we're investing about three million dollars a day – but we continue to invest in making equipment more productive, smarter.

We're now at the point where, for example, planters are guiding the tractors and telling the tractor how fast to move forward in order to optimize both the seed placement to assure the greatest yield output – we're doing things like variable rate spraying to assure that we don't put anymore herbicides, pesticides, fertilizers down than are absolutely necessary.

We have water-sensing devices now that we're putting soil probes, putting into the soil, where we're then not putting any more water on the ground than absolutely necessary to generate the most productive yields.

And through that, we think we can contribute to this require to increase on a yearly basis by 1.75 percent a year the output. That's probably where we will offer the most opportunity in terms of this total problem of doubling food output.

We're also, though, very much in the last few years focused on the low end of that, taking small-plot owners and finding ways to help them mechanize to increase output but more importantly to increase their economic standing.

And a good example of what we're doing there is this last year in the state of Gujarat in India we have a private/public partnership that we're working on where we've invested in 520 small tractors that we're investing in training a thousand different tractor operators in the farm villages, 500 technicians, bringing together the tools, along with NGOs, that are going to take 50,000 farmers that are, combined, only farming 40,000 hectares of land, but allow them to rent these tractors to mechanize for cultivation and then later on for harvesting and thereby tripling output.

That's our opportunity to do more to help mankind in that sense as well, and so we're focused on that. We have a similar project going in Zambia. So we're looking at it both on the low end - how do we take innovative opportunities to help farmers mechanize and by mechanizing, increasing output - but probably more important increasing their economic livelihood, at the same time with high production agriculture create smart solutions that let them definitely increase the yields, because that's what's going to generate the output that will end up feeding the world.

#### **James Borel- Executive Vice President, DuPont**

---

Probably the most important thing is doing our business the way we do our business. We operate in over 90 countries, so we're in the agriculturally developed areas and in some of the most resource-challenged areas. Our business is really about advancing science, coming up with newer, better products, better-yielding seeds, newer, better, safer crop protection products, but then also working with farmers to help them make the most use of those products, how to help them put them to use in a way that makes a difference in their operation. So while science is global, it actually helps remember that solutions have to be local.

And so as we do that business, it's important to make sure not just that we're there with products but we're there with service and advice and management expertise to help people really get the most out of them. And that permeates kind of everything we do.

But in addition to that, we're establishing more and more public/private partnerships. I can give you a couple of examples. We have been working for a couple of years now on two projects around taking technology that we have but getting it applied in places where maybe the financial incentive isn't enough but we don't have all the resources - Africa biofortified sorghum is one - partnering with foundations and NGOs and local companies to be able to have nutritionally enhanced sorghum available for African farmers and consumers.

Another one is improved maize for African soils, taking our nitrogen use efficiency technology, working with other partners locally to help get that technology into maize that can be used for improving African productivity in a way that a single company might not be able to get it done on their own.

And maybe the final one I'd mention is one we just announced last night. We announced a partnership with 4-H; because, as we all know, the generation of farmers that are going to feed the world in the coming decades are young people today. And so we're investing with 4-H to develop a leadership institute in Africa that will help to train adult volunteers, leaders to support youth development. And we not only need farmers for the future, we need agronomists and economists and all sorts of professions to be the support.

So we're looking forward to working with our local teams and with the global 4-H network to try to be a catalyst for positive use development in a place where it's needed greatly.

**Namanga Ngongi - President, Alliance for a Green Revolution in Africa (AGRA)**

Thank you. Nice to be at this 25<sup>th</sup> anniversary celebration. This is great. AGRA is relatively young, five years old, but I would say that in these five years we have tried to put in place systems that actually serve the smallholder farmer. As you know, African farmers are mostly smallholders. Mostly the food producers are largely women, but most of the technologies available don't get to them.

First, seed. Seed is taken for granted everywhere else in the world. In Africa most people recycle their own seed from their harvest. So how to set up systems to support seed production in Africa. Because of the great diversity in our agroecologists we need seeds that are adapted to particular agroecologist. So we have supported 60 seed enterprises that last year produced 27,000 metric tons of seed. We hope to have 40,000 metric tons this year of seed.

We are also supporting the development mechanisms by setting up small groups of traders called agrodealers. Our smallholder farmers are scattered throughout Africa, and it's difficult to reach them. So by having the small traders who are equipped, trained to be able to service more smallholder farmers. We have 10,000 of them now, and they are able to handle, oh, about \$550 million of inputs in a year, a lot of it also from many of the companies here around this podium, who use also the agrodealers as a source of distribution of their materials, their products.

Clearly, one of the real stumbling blocks for Africa is really how to have productive base to have sustainable and avoid moving from one hector to the other year after year, which is really practiced in much of Africa and leads to a lot of land degradation.

Soil fertility is critical. Fertilizer is very short. The average use of fertilizer in Africa is 90 kilograms per hector. Clearly, that's not sustainable. We are just mining the soil. We do need to find systems which are able to replenish the soil and get a good harvest of at least five tons, metric tons per hector. We are supporting that by creating networks of distributors, blending and producing appropriate package material that will give from us really decent production on the field. And I think that is already spreading quite a bit.

I would say the critical area of markets is not to be avoided. Africa smallholder farmers dispose very small quantities on each farm to be sold, so they will have to create systems that aggregate production at the community level through community-based storage facilities to be able to access markets, not only access markets but improve quality and standard, so that they can really access world markets.

To be able to package all of this together, AGRA came up with the strategy of developing, like they say “breadbaskets in countries” to be able to give a boost to productivity and technologies. In Ghana, it’s in northern Ghana, in Mozambique, the Beria Corrido, in southern highlands of Tanzania, in Mali the Sikasso area. And their country, realizing a rapid update of these technologies and great impact on productivity.

### **Richard Leach**

Thank you. I think incredibly exciting what you’ve all referenced and the immense impact of what you’re doing.

We’re going to shift now to a discussion mode. And, Hugh, if you could start the discussion about – What impediments? What are the top impediments to greater private sector investment? And you have the heads of state, you have key ministers – let’s talk to them as to what are the key impediments to allow greater private sector investment?

### **Hugh Grant**

So maybe it’s Scottish optimism, but, you know, when you start a conversation with – What are the impediments? It’s never a motivational speech. So I would say the impediments are less now than they were, so the trend line is improving, it’s just improving too slowly. So the direction’s right; the pace is wrong.

And so the good news is – There’s a heightened awareness globally about the importance of agriculture. And ten years ago an agricultural discussion would have filled a much smaller room than this. So there’s a heightened awareness, and I think that’s good news.

The impediments that exist today, as I look at an investment – I think business needs consistency and predictability. It doesn’t always get that. But consistency and predictability helps a lot, especially the long-term projects. And when you listen to the projects on the stage here today, they’re all long term; they all take time.

So agricultural policy, commitment to agricultural policy, regulatory architecture (so defining the scope of what regulations are), and then sticking to them makes the investment model an awful lot easier.

And when you look particularly in the new areas of biotechnology, defining what those regulations are upfront – in Africa hopefully on a Pan African basis but with some degree of consistency around the world – that makes the investment model much easier and increases the certainty of going big early, rather than what you see with many agricultural investments, which is a drip feed over time.

And as I look at the report that was issued today, the thing that we don't have as an agricultural community is time. So the crushing certainty is, it's going to be a much busier place for our children, it's going to be a much warmer place, and it's going to be a much thirstier place.

And the premium that that places on increase in productivity on a certain basis on a relatively short space of time, I think my biggest impediment would be increase in certainty and clarifying the investment track over time.

**Richard Leach**

Others? And we call it challenges instead of impediments, but the challenges.

**Samuel Allen**

Yeah, I might add, I certainly agree, and we could talk about the issues of governments and their impact, etc. What I would say is two areas for people to think about:

One is: There are a number of areas you go ahead and invest because of the size of the opportunity, even though there are still all these impediments. For us an example of that is Russia. A lot of impediments, everyone I would check off saying these are the reasons why you shouldn't, they're there; but we still invest, because it's nine percent of the world's arable land, eight percent of the world's fresh water. It has to be a breadbasket.

Some of the countries that we also talk about investing in aren't even one percent of the arable land – you won't take that list. For the heightened requirement for that consistency, for that government that is providing a more open playing field, becomes even more so for markets that in of themselves are not as large.

The second thing I would say is probably the number one, once you get past that, the number one impediment we have with, when you have a good playing field to play in or not. And most markets, the limiting factor to sustainable growth in agriculture is – do you have a solid financial system in place?

If farmers don't have access to credit consistently, in good times and bad, then you can't have sustainable agricultural growth. And we try to invest with our financial services division in as many of these as we can, but we can track it in so many markets where, when things get bad, and financial institutions move out and they don't loan to the farmer even though the farmer is still a very, very good credit risk, that's when you don't have the investments consistently being put in to drive the agricultural market forward. And that's a great opportunity, I think, for all of us to work on.

**Richard Leach**

And Pat?

**Patricia Woertz**

I might add to both Hugh and Sam's points of saying an impediment, it might be natural for us to say now an impediment is the global economy, the uncertainty in the global economy. And I'd just turn that a bit to say investment in agriculture actually helps economies. In fact, many



studies show that the investment in agriculture, as opposed to any other sector in a developing country, helps, helps grow out of poverty the most impoverished people in those countries two times as much as the investment in any other sector.

So sometimes we might think an impediment might be – is it really the right time to invest? We know these are long-term investments. But agriculture is good investment in the long term for both the countries as well as the private sectors who are doing those investments.

I agree countries need to have stable fiscal regimes, stable policies, etc., that are welcoming. Even open trade policies are quite helpful. And the anti-corruption views about the long term with their country and their relationships with the private sector that help the private sector say This is a place and a good partner for the long term.

### **James Borel**

Two things that I would add. I agree completely with the things that have been mentioned so far. I think the two things I'd add are:

In some cases infrastructure – if you can get better products to a farmer and help him produce more but they have no way to get it to a market, they can't really capture the value from that investment, etc.; so in many cases infrastructure becomes a challenge.

And maybe if we move from impediment to opportunity – policies that encourage innovation and science-based regulation, those kinds of things, are very helpful to invest, not only for companies like ours but for local companies to innovate, to invest and to really help move the capability forward in a local environment.

### **Namanga Ngongi**

I would agree that the financial situation is quite serious – it's there's not enough financial services to support especially smallholder farmers. But I would say recently we have started some innovation in working with local banks, commercial banks, to leverage resources in local banks and attend to one. And so far with the small investments we have leveraged \$160 million from local commercial banks.

But I'm pleased to say that governments have taken that up now. In Nigeria we are working with government for a major three-billion-dollar program to mobilize the resources from local banks and in Kenya for about \$650 million.

So it's beginning to catch up, but maybe you need also as major companies to participate in such schemes to really bring credibility into the banking system.

Secondly, I would say maybe the major problem is insurance. The farmer is exposed totally to make it or lose totally. Insurance products would be very helpful to retain.

And Sam, just to challenge a little bit – you are producing tractors with GPS. Okay, to plant and space rows and things and we are still using this (referring to string) to plant a row, okay, to be able to space between rows and within the rows, clearly you can put together some kind of institutions as you are trying to do in Gujarat too in Africa to have equipment and tools with

small tractors that will remove the back-breaking tediousness of African agricultural, especially by women.

### **Hugh Grant**

I think the danger of starting a conversation with – tell me the impediments – you know, there's at least a fifty/fifty chance the conversation is going to be a real downer. I think there is more opportunity here. As a challenge it's, absolutely, but I think there's more opportunity and there's more focus than there's been in a long, long time.

And if you look, you know, as a business panel, you know, these numbers are roughly right, but they're trending right but absolutely wrong. But if you take a ton of corn, deliver it to a village in central Malawi, it's about five or six hundred dollars to deliver that ton of corn. That ton of corn feeds a family of six for about a year. Growing that ton of corn in the same village with a piece of string held with the planting costs about fifty or sixty bucks.

And there's very few things in business where you see a ten times leverage. There's very few things in life where there's a ten X leverage. So there are challenges. But I think the alternative to a lot of this, particularly in Sub-Saharan Africa, it just isn't tenable.

So the theme of this meeting – *The Next Generation* – the challenge, I think, for us as businesses is how you clear the path, how you – to Sam's point – you know, how you say, "Well, there's some of these don't line up, but we're going to do it anyway." And how do you have the consistency that you can take a ten-year view when you make some of those decisions. But with these kinds of leverages, it's a very compelling argument.

### **Richard Leach**

Any other arguments? Or we could wade into the specifics of the policy environment that would be most conducive. We touched on the different policies that need to be in place. But being very specific now in terms of the environment within countries regionally, globally the policy environment that will be most conducive. Jim, do you want to start out on that there?

### **James Borel**

Sure. First of all, every country's different, so to try to apply something everywhere is impossible. But I think there are a couple of themes that are important.

One is – we talked about the challenge, double production, not many more acres, limited resources, so it's going to take science; it's going to take creativity; it's going to take innovation. And so everyone needs to be thinking about policies that encourage innovation, that encourage scientific advancement and yet safeguard the society from – you know, it needs to take into account safety and sustainability.

So science-based regulation is incredibly important. It can actually provide security or comfort to a society, at the same time provide, as Hugh said earlier, a more consistent and predictable path for industry. So if you know what the rules are, and they're based on sound science, then you can accelerate development. So that's one key area – to try to get science to the market faster but yet in an orderly way.

And another is around innovation. What do countries do about their investment in agricultural research or in the agricultural infrastructure? What kind of intellectual property rights do they have? What's the sum total of their policies that will encourage innovators both locally and globally to invest and to participate and to accelerate progress.

So if I had two themes, it would be those two that everybody should think about?

**Richard Leach**

Patricia?

**Patricia Woertz**

Well, I would build on Jim's point and say that, you know, not only environments that are encouraging for the investment and the innovation – I think it's not a surprise that the two laureates that we're honoring at the World Food Prize this year, President Lula in Brazil and President Kufuor from Ghana, have had the experience of some of those very policies, procedures, environments that both encourage the innovation, encourage the partnership, encourage the investment that is long-term view and have the opportunity to build out infrastructure if it's not already there today.

Brazil obviously is a very large country with infrastructure structures and infrastructure progress that has allowed farmers to be better off as a result. I think when we look at models of what one might do, I think those are two examples of countries that have come in different stages of their progress.

You mentioned cell phone technology a moment ago. When you think of infrastructure, you don't always think about cell phones, but that is one avenue that can add to the education process that can occur for the smallholder, that can occur in the communication from the farmer to the market to the next level of the chain.

So I think there's a lot that can be put into that individual package for our country to think about.

**Samuel Allen**

Yeah, maybe in a little different area, too, but it addresses what I think ends up being in the near term the single most pressing challenge that has to be addressed if we're even going to come close to doubling food output, and that's water.

If you look at today, 17 percent of the arable land that's under cultivation is irrigated, and it produces approximately 40 percent of the crop output. But agriculture is already using 67 percent of the world's fresh water. That's not sustainable. And if we're going to double food up, it's certainly not sustainable. But you're not going to be able to say – quit irrigating. That's the only way you're going to continue to increase it.

So around the globe, developing policies that help incent the efficient use of water is going to be extremely important, especially when you think that the two areas of greatest population growth are the two areas that are going to be very water challenged, and that is throughout Asia and throughout Africa.

And so I think to the degree that we can have forward-looking policies that help promote the move towards efficient use, it's going to be a key enabler of assuring that agriculture grows in a sustainable fashion.

### **Hugh Grant**

I just have two quick ones. I mean, the conversation on ag policy is a pretty dry one. Unless you're a policy wonk, I don't force the compelling piece. It's the backbone about these things, but I don't think it's the motivational driver. A long-term one is war. A near-term one is soil. I was in a meeting a couple months ago, and somebody said, "You know, we know about the soil structure on Mars than we know about Sub-Saharan Africa, because the soil maps were made in the 1800s, and soil has gone backwards since then."

Since 2008 I actually think agricultural policy has really picked up because there was a food scare, and prices went through the roof, and I think policy was torqued. So I think a lot of countries woke up and started rewriting ag policy.

I'm backing the theme of immediacy – so how do you build the soil maps? How do you learn more about what we have right now? And how do we use that as leverage? And then in the long term water is a big one, and the other one I would add there is education.

You know, agriculture should be a young person's game, and if this is a generational challenge, where are the future aggies coming from, and how do we make agriculture sexy again? Because the challenge in many parts of the world from a policy point of view is – people run from the farm to the city, and the last thing they want to do is stay on the farm or stay in agriculture. And I think that would be another policy piece. You know, if you were king for a day, how do you look on a generational basis at ag education and for those future scientists and those future breeders coming through in the next ten to twenty years?

### **Namanga Ngongi**

I would say that if you take the African situation, it's good to invest in more research, more science. But if existing science got into the hands of the majority of Africa's farmers today, you would be more than double the production. So there's a real challenge for information, for farmers to know what the possibilities are that they can use to be able to improve their production levels.

Secondly, there is nothing more inciting to adopt technology than to have the prospect of making an income from using that technology. So markets have to be better organized so whatever impediments there are in countries have to be removed so that people can access the best possible markets they can within their countries and within their regions. If that can be done, I think that will be a major way to move forward.

Investing in new technologies is fine – we are in a technology organization also – but I think we do need to focus on information and on access to markets and what governments can do to improve infrastructure. Because really the infrastructure in Africa is quite bad.

There's no doubt that Ghana is achieving the Millennium Goal Number One, not just because of the hard work of Ghanaian farmers - but there can be relatively good infrastructure also in the structure that meets really the movement upward from one region to the other and the movement of inputs that are required in the country. So I think President Kufuor merits this, to be a laureate of the World Food Prize.

Really, there are a few things that can be done, but you cannot meet all. In the long term, water is very important, but it would take quite investments and much longer period. But we can improve on the farm water management which is not dependent on large-scale irrigation systems but to improve the farmer's knowledge on water harvesting and being able to have terracing for water to get into the soil than running on the surface.

And I just wish to take this opportunity to say also in the fertilizer area, AGRA has just partnered with the IFDC, with NEPAD to create what is called the Africa Fertilizer Agribusiness Partnership, which will be trying to organize on a much more larger scale, starting with Tanzania and Mozambique and Ghana just how fertilizer supply value chain, which will be much more, let me say, farmer friendly.

#### **Richard Leach**

Any comments? Namanga mentioned, and you've all alluded to increasing access to markets of the small-scale farmer. Any thoughts on activities that can be undertaken to in fact increase their access to these markets? Patricia?

#### **Patricia Woertz**

Well, I commented about a few of them, but let me maybe go into a couple of examples. We're investing heavily in Paraguay at the moment where the producers are expected to double production within a very short period of time, and the ability to export from Paraguay through the Paraguay River needs investment in storage, it needs investment in fertilizer blending plants, it needs crush facilities so that some of those components can be used both locally in Paraguay, as also to create markets outside. Without that investment, the market would not be there for those farmers to increase that production.

There's only certain things large can do, and there are only certain things that the opportunity for scale can also improve in the local community. So that's an example of a particular market that the expansion is quite optimistic in the long term.

We feel really good about agriculture's ability to be able to meet this future, which today is challenging, the gap is large, but I think there is - Again some of the discussions we've had at the stage here today show that it is possible.

#### **Richard Leach**

Comments?

#### **Namanga Ngongi**

I can take that. We in AGRA, we are - I told you already, our farmers are small, available surpluses are very small, so we have to have a mechanism for aggregation. And we do that through the warehouse receipt systems, by having the hundred or so farmers get together,

bringing small quantities of food together. We say food can be cleaned, graded, packed bagged and stored in better storage conditions, which will reduce spoilage and post harvest losses which are already very high.

Also, that system is now growing throughout African countries where we are working. We are linking those farmers to working particularly with the welfare program, in the purchase for progress program that they have, to lead them to structured markets where they will be able to predict that they will be able to sell next year and the year after that, therefore build their production base.

### **Hugh Grant**

Two very simple ones. If you look at - and I completely agree - one of the near-term things is access to markets. One of the first inflection points is the construction of a futures market, so that when a farmer plants a crop, he knows that he has some of that value that he can lock in or that he can trade against, and in the absence of that futures market when he has a gigantic harvest and harvest size is increasing, yields are increasing. But you need to know how you can trade that surplus, and you need to know how you can trade that farm surplus in the future.

So the construction of basic capital markets that allow future trade is a great enable for a smallholder, probably even great than for a conventional farmer here in the U.S.

The second one I've seen up close, I mentioned in my introductory remarks, is the use of cell phones. Because one of the things that has happened in many, many of the developing markets, they never went through the hassle of land lanes and operators and exchanges - they jumped straight to digital networks. And that has given in African and in India farmers a great degree of market transparency, so they know what the market price is rather than this intermediated. And that transparency in price gives them an idea of what their crop is worth on that day.

So very often we talk about markets as open enough export markets, but I think there's a step before that, which is - how much is my crop worth today, how much is my crop worth in the future, and are there formal financial mechanisms that allow me to trade? And that's beginning to emerge in some of these countries.

### **Samuel Allen**

Well, I guess from Deere's perspective what we've tried to do to address that - when you think of the smallholder farmers, we can't understand their value proposition, and we can't design to support that value proposition from big-farm places like the U.S. and other places.

So what we've had to do - and we did this a couple years ago for 50-horsepower and under tractors - we moved our design headquarters from here to the largest tractor market in the world for small tractors, which is India - 500,000 tractors this year under 50-horsepower, but it's a price point that's seven to eight thousand dollars. So you have to think totally different about how you're going to satisfy those.

And we've now introduced products to meet that. You know, we're going to introduce in the future - one of the things we have to do is come up with a low-cost GPS system that eliminates that, but it can't be the system that we're using on our big tractors here.

And I think part of this – this goes with the whole globalization issue – part of this is you’ve got to be in those markets and really thinking about that market: How do we solve that solution?

Then I think the second part – and I mentioned it in Gujarat, where also, as I indicated, that same model is being used in Africa in a number of countries – but a one- or two-hectar farmer is never going to be able to afford to mechanize. You can’t put the numbers together and get it to work.

So you’ve going to have to come up with cooperatives. Either it’s owned by the village and leased out - There’s going to be new models that are put in place, and that takes a lot of private/public NGO-type partnerships to get that done. But I think there’s tremendous opportunity there, and I see happening. We see that happening in a number of our markets today.

### **Richard Leach**

It’s actually a perfect segue to perhaps provide some guidance to a lot of folks who are here, for example, from the U.S. government and other development agencies around the world. From your perspectives, how best can the U.S. government, development agencies, and others play a role in achieving the goals that we’re all talking about? Jim, do you want to start that off?

### **James Borel**

Yeah. One of the most important things we need to recognize is – along with the urgency of the need for productivity improvement, we need to help farmers everywhere be more productive. We’re past the point of surpluses in grain.

The USDA report that was out just a day or two ago indicates cornstalks are going to be less than seven percent, which is less than half what they were a year or two ago, which was at all-time lows or historic lows. So there is no shock absorber in the system. This isn’t a challenge that is 2030 or 2040. It’s a challenge of 2011 and 2012.

So it’s not about increasing productivity in the agriculturally developed areas – it’s about helping farmers everywhere be more productive. And I think from a government point of view, governments need to understand that. They need to help their own areas be more productive. They need to recognize that they might have a role in helping other places be more productive.

And so we just encourage the broader view of trying to help drive productivity everywhere – that’s good for feeding the people that need the food today; it’s also good for economic development in the long term. You know, we often talk about producing enough to feed everybody, but if you look at where the extra two or two and a half billion people are going to be in the next 30 or 40 years, they’re likely to be in the same places that are, you know, Africa, South and Southeast Asia, that are currently challenged around productivity.

So even when we significantly increase production in those regions, it’s unlikely that we will be able to produce enough more to feed all the new people. So the challenge is going to be how – how do we build the agricultural development so the economy is developed so that we not only

have more food in those local areas but we have people who can afford to buy the additional food they might need.

And so to me the key thing governments need to keep in mind is helping to improve productivity everywhere, what role can they play in helping that happen and not just take a parochial view.

**Richard Leach**

Patricia.

**Patricia Woertz**

I'd just add to that – because I think productivity is extremely important – but acknowledging the interconnectivity of the world.

And that sometimes means global trade issues, and it sometimes means having markets that talk with one another. Certainly areas that currently are in surplus won't always be in surplus, and areas that are currently deficit won't.

And there will also be climate issues. If we could predict the weather, you know, that's part of what agriculture has not been able to solve.

So there does need to be that interconnectivity, and I think as long as governments continue to recognize that, that will be important.

**Richard Leach**

Sam, as part of the discussion thinking about, for example, the U.S. Government's significant investments, their incredibly creative program, Feed the Future, and things the U.S. Government is committed to doing, and others – so also touching upon that. Sam?

**Samuel Allen**

Well, I'm just going to reemphasize this, and if I don't get where you want me to go, you thump me across the head and tell me, no, that's not right.

If you lay the map today of where agriculture is, where it can generate the output, and you lay where the population is going to be in 2050, they don't lie. And the only way the world is going to achieve that output on a sustainable fashion is to have a very efficient free trade system around the world.

And it has to be, people have to know that year in and year out it is going to be free; otherwise, people are going to work so hard on food security, internal to their own, and it will be inefficient. And you won't be able to get there; you won't be able to solve this problem.

You have to allow the areas that are blessed with the soil, blessed with the weather, that can develop the output to do it and not have \$600 transportation costs to get it.

Certainly everybody wants to grow something and move agriculture forward in order to develop their country. But you've got to, in addition to that, have very efficient free-trade



systems so that the food can very cost effectively and efficiently get to all the people of the world.

That to me is the number one thing that the U.S. Government as a leader in this area can work on.

And then as we've shown with the Global Harvest Initiative, we haven't focused on agriculture and this problem on a coordinated fashion for a long time, and I think the government can play a very valuable role in helping bring all of us together, including academia and research, basic research, to help continue to focus on this issue, whether it be in the area of seed genetics or whether it be in the area of developing, thinking about how we're going to develop the infrastructure to support getting commodities all around the globe.

### **Hugh Grant**

I completely agree with the panel. The only piece of it is advice to governments, particularly the U.S. Government, is – how do they help turbocharge collaboration? In the Kennedy era, this was a brand of the U.S., and that brand has still residual strength around the world. People remember what the U.S. did with extension work, USAID, and how they taught farmers around the world.

This is the Borlaug Symposium – this was the epicenter of this – and I think it's been lost. And if you fast-forward, the harsh reality in this, I think, is companies cannot do this on their own. It would be naïve to believe so. Similarly, governments have proven that they can't do it on their own. And the emergence NGOs, I think, is a consequence of that, because NGOs are closest to the farm, they're closest to the village, they have local knowledge.

And I think if there wasn't one single new piece of technology developed and you said – how do we leverage the technology that we have today, it's going to be contingent on governments, the private sector and NGOs coming together in a much more collaborative fashion, rather than the standard protocol of everybody separates to their comfortable corner of the room.

And I would love to see real attention to how we drive collaborative protocols in the future. That's a really hard thing to do, but it's where the juice is in this – I really believe that.

### **Patricia Woertz**

That's one of the reasons we created the Global Harvest Initiative, the four of us on this panel, because we thought that partnership was important and to have the discussion, sometimes the difficult discussions, to invite the public sector to be part of that, as you described. It's an important, important aspect.

### **Richard Leach**

Sam – Jim – or Namanga?

### **Namanga Ngongi**

I would say that of course the U.S. Government's Feed the Future is very much welcome, and I think the focus to invest through government-led agricultural development programs is

welcome. But that, of course, should include the private sector and particularly the local also private sector and local NGOs that are working much closer to the farmers to be supported.

I would also say that maybe that has not come up in the discussion is support to the young to have programs that really attract young people to agriculture, especially in Africa where I am a farmer myself and I think I'm a young farmer. So that's not very good - we do need farmers who are slightly younger than myself.

And that can only be if you have agriculture a little bit more professionally organized as a business, so that the people can be attracted in the long term to agriculture, where without which it will be difficult to really have the boost in production that we are all expecting.

But I would say that I am confident in Africa, because first of all our yields are abysmally low, but one metric ton of something like 20 bushels per acre by your standards here in the U.S. The chances of doubling or tripling or even increasing fivefold are within our grasp.

So it is how to get this existing technologies even before we invent new ones in the hands of African farmers, smallholder farmers, and organizing them in ways that they will be not only producers, they will be also sellers of food, so that food will become a source of real income that will engage them the long term in agriculture.

I am confident that it can be done.

### **Richard Leach**

The optimism that he was referencing - I mean, any other comments, Hugh and Patricia?

I think the challenge you put forth in terms of enhancing collaboration is a challenge that we will embrace and I think half the people in this room will also embrace and look for opportunities to enhance.

And as we talk about those types of public/private partnerships, are there types of public/private partnerships that come to your mind now that we should pursue that could be more effective and help move these issues into perhaps more of the forefront? Starting with you, Namanga, and others who might want to comment.

### **Namanga Namanga**

Yeah, there are opportunities for public/private partnerships, especially in the input supply system. If you take seeds first, you have to increase the amount for seed knowledge, that they're useful. That is not a private company business although private companies can invest in that. Government systems can really carry out the demonstrations that increase farmers' awareness and use of such inputs. Private sector can produce those inputs that they are now the ones to go to the original research and building the demand for it.

You take the fertilizer supply system - of course, you do need partnerships. Governments control the allocation of foreign exchange in most of our countries; therefore, if that can be done ahead of time, early enough in the season, the private importers can be able to put in place the

mechanisms that allow the inputs to arrive on time and in the appropriate blends that are required by different production systems. But normally that's almost broken down.

You take the financial system – you can already describe the work they're trying to do in Nigeria and in Kenya where the government can also put force on the table to leverage the financial system of private banks, that they are able to become financiers of the agricultural system.

After all, the central banks of our African countries control a lot of resources which can be used to stimulate the private sector – not giving away the money but using the money to leverage the money that is in the private sector.

### **Samuel Allen**

I would reinforce the point that Namanga made earlier, and that's the private/public partnerships really around the area of education. And I give two examples that I think bookend this.

About five weeks ago I was in Kazakhstan, and I was with a farmer who's farming 1.2 million hectares, 3 million acres of land. Ten years earlier 80 percent of that land wasn't farmed. But it was the knowledge of no-till that enabled them to farm a lot of land that had very little moisture, but with no-till they were enabled to do that.

A couple weeks ago we were in Northern India, and the farmer had 1.2 hectares of land. Again, what we were able to see were so many places where that from, through having a better knowledge of what to do – And as an example in their case, putting way too much fertilizer down for so long that it ended up poisoning the land. But there were opportunities there again to really improve their knowledge base and immediately turn around and improve the productivity and output.

And when you talk about education, it seems like a great, great opportunity for public/private partnerships to work to enable that.

### **James Borel**

I think that improving productivity. We've talked about improving productivity, helping farmers everywhere improve their productivity. Probably the first thing we need to think about, rather than a specific type of collaboration, is we all need to think about – how do we help an individual farmer have all the things they need? Just giving them good seed but they don't have the fertilizer doesn't help, or no access to market.

So we ought to be looking collectively at – how do we create collaboration that helps the system develop so that an individual farmer, village, area, region, can be successful.

There are thousands of great examples of projects going on in many of these areas, all having some impact, meaningful impact. So I don't have any question about the creativity or the ability to form collaborations.

If you go back to your first question around impediments, perhaps the biggest impediment might be our own ability to get out of our own box and think creatively and take collaboration to a whole new level but start with the farmer in mind and how do we help them have the tools that they need to really be successful.

If we do that, I think we'll have an explosion of collaboration that really does make a difference.

**Richard Leach**

Patricia.

**Patricia Woertz**

One of the things that the World Economic Forum – and the future vision of agriculture is part of that; and not to advertise another program, but we're all focused on the same direction of reducing hunger – is to take models that have worked well, whether it's in Tanzania or Malawi or wherever, and spend time together – and this would be NGOs and CEOs and the heads of state and agricultural ministers – to say, how do we scale this up in our area, and then make commitments to do so.

So these are actions that must take place on the collaboration between that meeting and the next one that would occur, say, in six months, so that sort of the commitments to one another around the collaboration take form in a way that can actually be seen at the next time, so rather than just a dialogue, taking it to the next level.

**Richard Leach**

Hugh.

**Hugh Grant**

My only – and this kind of sounds fluffy, but it's personal experience in these. We've been involved in a couple of collaborations. They take time because they're based on relationships. You're dealing with people that you've never met before. They're very often high stakes, because people are depending on you.

So setting goals upfront, defining how you're going to measure it, and having common understanding of the goal that you're chasing, and talking a lot, makes a big, big difference.

So I think in agriculture, if you take the breadth of our industry, very often we don't talk up and down the chain, and we don't communicate as well as we could or should. So I think a piece of this past point is how do you drive this further or how do you scale it? We probably need to go back to school on how do you collaborate, and how do we work together across sectors. There's an art in this rather than a science, I think.

**Richard Leach**

I think I'm being flashed the sign that we're getting low on time, and I was hoping that perhaps we could go down the panel, and any final comments that each of you would like to offer to this incredible assemblage today – and start with you, if we could, Patricia.

**Patricia Woertz**

Well, I would just maybe reinforce that we heard obviously about the world population. We've quoted it many times of being nine billion people by the middle of the century and that we will have to double our food production to meet those needs.

But the optimism that I heard from the panel around – agriculture can do that – and we want to, we must, it's important. Dr. Borlaug said in one of his comments that he actually felt the technology was here today, and the pipeline was full enough to feed ten billion people. And I think he was right.

It's not that we need to create new technology – it will continually evolve – but I think we need to work together to help each other's success, and that is the success of countries, of companies, of the people that need the food most. And I'm confident that will happen.

**Hugh Grant**

I'm optimistic. I think the opportunity lies ahead of us. The clock is ticking. I think we spend probably too much time collectively defining the problem. We all make the same speech, and I think we need to spend a heck of a lot more time talking about the solution to the problem, and I think that ties in with Pat's point.

A couple of years back, all the corn produced in America divided by all the farmers in America, you got an average of about 150 bushels an acre, and the same year in Brazil, India and Mexico, it was about 50 or 60 bushels an acre, and in the same year, if you look at solid numbers, Africa was about 20. That curve has to change, and I think with the tools that we have in hand today and the tools that are over the horizon, there's a real chance to do that if we work together more effectively.

**Samuel Allen**

I would say for now almost 75 years, Deere has been committed to those linked to the land. It is a great space to be in. We are excited and optimistic about the opportunities.

We also feel a great sense of commitment and obligation to help solve this because we have such great opportunities in this space. So I would just tell everybody you can be assured that Deere is fully committed to helping be a part of the solution.

**James Borel**

I often refer to agriculture as "the optimistic science." And, you know, Malthus was wrong the first time, and I think he'll be wrong again. But I think the points that we've made are important – that it won't happen automatically and it's going to mean all of us really challenging ourselves to find ways to work together or to collaborate at levels that we haven't done before.

But that's possible, and I think with the interest, the commitment and the energy that I'm sensing over the last number of years, I'm increasingly confident that that's going to happen as well.

**Namanga Ngongi**

Africa has the greatest challenges today, but Africa also holds the greatest chances for success in the future to feed not only Africa but to feed the world.

We encouraged by the US Feed the Future, which is also focused in African countries. And especially a few months ago Secretary Clinton made the statement calling for an African Green Revolution. I think was very great on her part.

And I am encouraged also by the fellow panelists here from the private sector to see the great investments that can be made also by private sector here in Africa.

Clearly, the United States has a wealth of information and technology, which we can put to good use in Africa. And I hope that at meetings like this will work to mobilize and generate that kind of interest that will lead to greater support for African agriculture and especially smallholder farmers, most of them women.

**Richard Leach**

I would just say in closing that this is truly an unprecedented moment I think that we're all in, where there is now across all sectors a commitment to increasing agricultural production as a tool not only to bolster economies, as a tool not only to ensure global stability, but really as a tool to deal with and address extreme point of view and hunger.

This is an incredible, unprecedented moment that we're all in, evidenced by the fact that you have four CEOs of Fortune 50 companies sitting up here talking about something, which I disagree – this is sexy now. Matt Damon is doing PSAs; we have Angelina Jolie doing things. This is really the wave of the future.

I thank you all very, very much. This is an incredible panel. Thank you.