CONVERSATION: ASSESSING PROGRESS IN GLOBAL AGRICULTURE

October 16, 2009 – 10:30 a.m.-Noon

Ambassador Kenneth Quinn – President, the World Food Prize Foundation

Last year Sylvia Mathews Burwell, the head of global development for the Gates Foundation, was one of our primary speakers, and she challenged us: Could we have the World Food Prize be a place where each year we take stock of how we're doing. Are the things we're doing working? Should we be doing other things differently? So responding to that challenge, we have the next panel. And I want to invite our chair for the panel, Joachim von Braun, to come up and the other members for our concluding morning session.

Joachim von Braun – Director-General, the International Food Policy Research Institute

Good morning. I want to invite my colleagues on the panel to come right up. And while they settle down, let me briefly introduce what the purpose of this panel is.

This was a very rich menu of panel discussions and individual presentations. At this stage of the Norman Borlaug symposium, it is probably fitting to ask what was missing, what is still missing in the debate, and to debate an agenda for moving forward. So the two issues with which I will engage my panel are: What has not received enough attention, and what are the challenges we need to focus on in order to move global agriculture forward? And secondly, I will engage them in a foresight exercise. I will ask them, looking backwards from 2050 – the world [being] 9 billion or so – what type of agriculture and food system do we want to have by then? And how do we get there? So looking back from the future – a debate.

So the title of this session is "Assessing progress in global agriculture." We will also modify the first word into "Achieving progress in global agriculture." For Norman Borlaug, progress was a clear concept – increase the yields, increase the production. And for him it was certainly not simply pointing at potentials. He kept saying, "You can't eat potential." So we will not look at potentials.

We want to be results-oriented in looking forward. "Results-oriented" means that yields increase, water use efficiency is increasing, poor people eat better, hungry people eat more, micronutrient deficiencies are decreased, food safety is improved, the shoe size of environmental footprints are shrinking. So it's a multidimensional progress set of indicators which we need to drive at. It's not just one. But we must not get confused among them. So I will also press my panel to give us their results-oriented indicators. We accept general happiness indicators – food happiness, agriculture happiness – that will be fine, but we want to be measurement-oriented. This is a great panel, which will live up to the task.

We have Marco Ferroni all the way to the right. Marco Ferroni is the executive director of the Syngenta Foundation for Sustainable Agriculture. Marco used to work with the World Bank and the Inter-American Development Bank. He comes from Switzerland.

We have next to him Hans Herren. Hans Herren is the World Food Prize Laureate of 1995. Hans is the president of the Millennium Institute, and he was a co-chair of the International Assessment of Agricultural Knowledge, Science and Technology for Development, the IAASTD Report. I promise no more abbreviations, but this one I [will] use. Hans is also a citizen of Switzerland or comes from Switzerland, so that makes our panel very balanced. We have two Swiss colleagues on the panel, but you know Switzerland is internally very diverse; and you will see that between these two colleagues from the great country.

J.B. Penn is chief economist of John Deere. He was under secretary of USDA for farm and foreign agricultural services, and he is a member of the International Food and Agriculture Trade Policy Council, besides many other international bodies.

And we have last, not least, Brian Halweil. Brian is with Worldwatch Institute. He has his degrees from Stanford and Davis, and he has been engaged not only in international risk assessments on food and natural resource issues but also was engaged and is engaged in California in community gardening programs, organic farms, and was so, I believe, when you were already in Stanford as a student activist.

So we have very different perspectives here on stage, which I think is helpful. And this panel will touch hot potatoes – it's a no-taboo panel. J.B., let me ask you the first question. J.B. Penn has, as I said, a very longstanding career in the private sector and in the public sector. The dual question to you, J.B., is not only, what have you been missing in the debates so far? But also – you have seen strategies come and go. And some of [the] strategies and new plans of the U.S. government and the world have left good traces, and others have no traces; they have disappeared traceless. How do you assess the current energetic debates and strategies of the new administration and of the G20? Are you optimistic about them? Please go ahead. And we all want to be rather brief – a couple of minutes' opening statements or comments.

J.B. Penn – Chief Economist, John Deere

I suppose you ask me the question because I've been around a long time – or look like I have maybe, so that I would have seen things come and go.

Catherine Bertini said, in the previous session, that agricultural development is back on the radar scope. That's certainly true, and there is a lot of discussion now about agricultural development and strategies and the proper way to do it. Much of this renewed interest and attention is owed to the commodity-price spike of mid-2008. And I must say that that was a wake-up call to lots of people and lots of governments – but not so much because of the hunger concerns, I'm afraid, but because of political instability, because of the threats of civil unrest. And we saw that, with no more of a price spike than [what] we had, there were riots and fragile governments were threatened in over 30 countries.

So that has put agricultural development back on the map, and we are seeing the G20 commitment, the $20 billion that has been pledged. And has Per Pinstrup-Andersen said yesterday, "Pledges are one thing, delivery is another." He sounded a bit skeptical, so we'll see how that turns out. But also you referenced the U.S. government. We have now an active debate underway to reexamine our economic-development focus [and] activity and the pledge of some $3.5 billion in new funding. And there are new initiatives at the World Bank, and there are new initiatives by other national governments. So there is quite a lot of activity underway, quite a lot of discussion. Much of that that has been carried on here at this meeting has been about the appropriate ways to do development, what's worked in the past and what hasn't.

I think that all of this renewed attention is a good thing, and I think these initiatives are a good thing, in large part because it does concentrate some additional resources to the problem. But it also gives the private sector some reassurance that this time things may be different, that this time there really may be a critical mass of effort and funding. And so the private sector gets interested and involved, and we all know that if development is to succeed, we must have the investment of the private sector. The governments never have enough money to get the job done, and we must have the innovation from the private sector. So I am heartened that the private sector is showing so much interest in these new initiatives and these new strategies that are being talked about.

Now, will it last? While I'm optimistic, the big question is – Will this endure, will this be sustained? We've had two huge harvests in the world, largely a result of farmers responding to the price spikes. Farmers are good economists – you get high prices, they farm more land, they use more fertilizer, higher-quality inputs. We've

seen two huge harvests at the same time that we have seen a very severe global recession dampen food demand.

So we have corrected the strained situation that we had in the middle of last year in terms of supplies and stocks. Commodity prices have fallen, and the forecast of the global harvest for 2010-2011 will be less of an increase than we've seen in the past two years because of the decline in prices; once again, farmers responding to the reduced incentives.

Now, when prices fall, interest wanes in agricultural [and] economic development; even though the hunger numbers don't change or go up, the interest wanes in agricultural development. So we have to see whether the interest this time is going to be sustained or not. Lots of people make pledges. Governments make pledges on proportions of their budgets for rural development. But whether this is sustained or not, I think, will be the real test.

I am optimistic that this time is different, that this time we are seeing some practical, level-headed approaches to development. The discussion in the United States about how to go about this is especially heartening. So I'm a little more optimistic than usual this time, Joachim.

Joachim von Braun

Okay. That's good news, because usually you are a skeptic. J.B., let's stick for a moment with the private sector, and I'd like to ask you a follow-up question. This World Food Prize forum has seen a wonderful set of speeches and [we've] listened to visionary statements from top global leaders in the private sector. But you have just said they are responding to price elasticity. When you say "farmers," you also say, broadly, "private sector." So would you care to comment on the great comments which we had heard from the leaders of the corporate sector at this panel? Will they say the same [things] next year?

J.B. Penn

Well, I can't predict; my crystal ball is not that good. But, again, my sense is that there is a better understanding this time around of the fundamentals for this business, and that is the long-term supply and demand. If you look at the numbers, we're going to add 3 billion people; we've got to perhaps double food supply in just 40 years' time. So that means there's got to be a lot more agricultural activity in the world.

And we're not going to have any more resources to use. I mean, we've got about the same bundle of land and water, labor resources, going forward that we have today and no more. So we're going to have to be more creative. We're going to have to have productivity growth. So I think the business community – at least the business community that I'm familiar with – is recognizing the fundamentals, and they're taking a longer view than they might normally take. And my sense is that they are prepared to make the investments.

But now this other term, an "enabling environment" or "enabling policy environment" has been talked about a lot at this conference – and that's the key for business. I mean, you've got to have an enabling environment. If you have that, then you look at the fundamentals of the sector. If they look good, then the investment will occur, the ingenuity and the innovation will occur, and things will get better. But if you don't have that enabling environment, it's just not going to happen.

Joachim von Braun

Yeah, great. Hans, you have been at the heart of the leadership of this International Assessment of Agricultural Science and Technology that was completed about a couple of years ago; it included the private sector until it dropped out, a lot of active NGOs, and many governments. And it has resulted in a very comprehensive report, which I recommend to everyone to read. But it also continues to have an aura of

divisiveness. I recall Bill Gates' statement here that we really need to bring together, and not divide, the environmental aspects and the technology aspects for agricultural development.

Now, with two years of hindsight – getting into the foresight experiment, which we want to do in this panel; you were very much at the forefront of looking back at the future and what needs to be done – [is the] message still the same as presented in that important report, or how do you look at it? And please take a moment to tell the audience, who may not have read it, what are the key messages of the assessment.

Hans Herren – Co-chair, International Assessment of Agricultural Science and Technology for Development

Thank you, Joachim. Well, the key message is one sentence: Business as usual is not an option. I think that is really the main statement which came out of this huge piece of work – 4 years, over 400 people from 52 countries – so we've been really much involved in this and basically all the stakeholders.

And let me just mention that the private sector is only, basically, private sector from the North in one group who quit; there were private sector from the South who remained still part of the assessment. So not just everybody on the private sector did quit.

The other main message, if you want to sort of look at – if business as usual is not an option, what have we sort of been suggesting? Because there were only options for action; there were no recommendations because no country would put their signature on the report which forced them to do something. We had to be quite diplomatic. It was really the emphasis on moving or taking agriculture as part of the system and looking at the multifunctionality of agriculture. So we have the ecosystem, the environment, and then we have society, the people, and then we have the economy, so they all need to work together in harmony rather than sort of in disharmony.

And I have not seen much really moving. Even if I listen here to all the talks, I have the impression that we still try to rely too much on sort of narrow, technological inventions or implement narrow technologies rather than really looking at the wider system. Again, we heard many times about the need to have biotechnology, for example. But that's just one part of what is needed.

Our report really goes in very great details on how we need to manage better our environment, our natural resources; we have to conserve and save them and make better use of it. And if technology comes in or needs to be in there, that's fine, but I think it should not be the cart in front of the oxen. Technology has to be put in where it's needed, so it is actually a solution to a problem rather than the other way around – a solution looking for a problem somewhere. So I think that's what's important.

And if we look at what's happened in the year and a half now since the plenary in Johannesburg, where 59 countries have signed on – the exceptions you probably know, but I like to repeat them whenever I can: the United States, Canada and Australia – and the main reasons actually were in issues of trade because we said that when it comes to trade, countries need to make their own decisions on agriculture, because they need to protect their markets. You cannot compete with highly subsidized goods from the North in the South and think that you can develop agriculture. So this is a very key, really important message.

I'm not sure much has changed yet. I know that some countries are talking about changing the way they provide support to the farmers, moving more over toward rewarding ecosystem services so actually farmers do the right thing: producing food, quality food, good food in good quantity, but also maintaining the resource base, which is going to be required not only the next five years until we get out of a crisis but for the many generations to come. So that was one aspect.

The other one was, obviously, on the biotechnology – not so much "biotechnology" as one component of biotechnology, [which] was genetic engineering and GMO crops where, again, we felt in this report that genetic modification can contribute, but more research has to be done across the board from ecological

suitability – what are the long-term consequences? – all the way to health issues. So we just don't know enough.

The other part of it is that as of today – and this was confirmed by actually a study from the Union of Concerned Scientists just about a couple of months ago – these crops do not yet, at least yet, increase the yield potential or yield. They may facilitate the farming, mostly large-scale farming, so that they have advantages. But that again doesn't mean it's something that we need to take out of context and push more than many of the other issues in sustainable agriculture, agroecology, because that's sort of where we came from with this report.

I don't see – and even from what I heard the past few days here – that it has really gotten into the bottom of what we are trying to do here in agriculture. So I hope that, as time goes on, there is more interest with the report, and there is interest out there, at the level of governments. I know because I'm out there talking a lot about this report in many places, in Europe, in particular, where there's a strong interest for it.

So to me it looks like there is growing interest. What is very unfortunate is that some of the major organizations, like FAO, have actually sort of almost shunned the report, although they were a part of it. And we're still trying to see, now, how can we make sure that it is adopted at highest places and not only the lowest places.

Joachim von Braun

A friend sent me an email yesterday, reporting on a discussion which he heard at an important conference in Rome a couple of days ago. And somebody had said, "African agriculture is, by default, ecological. And that's an opportunity; that's the direction we should take." Hans, would you have cried or shouted on that statement?

Hans Herren

I would have, because a lot of people say that the problem in Africa is that they do organic agriculture because they don't use any inputs. And that's exactly not organic agriculture. I think this is very wrong to think that because you don't do anything, you do organic, because organic or ecologically sound agroecology means that you're taking care of your environment. The problem [for] African farmers is they don't have the means to actually – because the crop price is so low – take care of their soil, to provide amendments. And you need amendments in organic form or in other forms sometimes, in mineral forms, to get going. So to me it looks like this idea of saying, "Oh, they don't spray pesticides, they don't have the money, or they don't use fertilizer; this is organic" – I think this is very wrong. I really do.

Joachim von Braun

Thank you. Marco, also your perspective, please, on what's missing – what have you missed the last one and a half days? Your foresight – and a specific question: have we gotten the research agenda right, globally and nationally?

Marco Ferroni – Executive Director, Syngenta Foundation

Let me address this, Joachim. Thank you very much, but let me preface what I want to say by addressing what Hans just said and then say that I thought that he and I were going to be disagreeing on this panel, but it seems not because he says business as usual is not an option, and I resoundingly agree – business as usual, ladies and gentlemen, is not an option. And I think that this is a point that has been driven home in the course of these celebrations here at the World Food Prize forum.

And why is business as usual not an option? Because we're not producing enough food. And the perspective, if we continue with business as usual to 2050, is precarious. So we need to – if we look back from 2050 (and I'll get to the research agenda later), if we look back from 2050 to now, basically what is the measure of whether we will have succeeded in feeding those 9 billion people at that time?

The answer turns around the way in which we will have been able to address the performance gaps that we see at the present time with 1 billion people hungry, population growth out of control, grain yield-growth declining, and so on. And the smallholder community that is out there – the 400 to 500 million small farms that will continue to be important, in that horizon of 40 years that we are talking about, not being able to, for lack of technology and services and adequate supporting policies and so on, not being able to make the contribution to food security, economic growth, and livelihood improvement that they might be doing under another sort of scenario.

I think if you're asking me in the way you have, Joachim, the most important priority that I am seeing going forward to 2050 is to live up to the Borlaug challenge. But by adding one adverb to it. The Borlaug challenge was, Intensify agriculture. And we now have to say, Intensify agriculture *sustainably* – using land and water wisely, stopping the mortgaging of our ecosystems, and so on. And this, of course, requires that we make full use of the arsenal of technology as well as the best of our policy and management capabilities.

And what I deplore, as we discuss this – and this has not been a major issue in the discussion here in the World Food Prize symposium, but it did come up in the intervention on the IAASTD report just now – is that there seems to be part of an important community of shapers of opinion out there, mostly in rich countries where we can have the luxury to have such debates, about such basically two schools of thought: the productivity school, as I would call it, and the sustainability school. And I would just hope that by 2050 – actually way, way before that – we would have an opportunity to bring those two ways of thinking together in some constructive anyway. Because it is about intensification of agriculture, but it is about doing so sustainably.

Joachim von Braun

All right. That's a very clear message from Marco: move the two schools together, forward to the one-room school in which Norman Borlaug started his life as a schoolboy, and read from one script, get taught on both technology and sustainability in order to achieve progress.

Now, Brian, your writing focuses on risks and uncertainties and around the environment and agricultural system. If you take a fair look at risks, the world has become a less risky place. Humankind lives longer. But when people get more wealthy, as the average world citizen does, they don't want to put up with risks anymore. So the demand for insurance and risk reduction is increasing very quickly. With that precursor, I'd like to ask you to elaborate a bit about the big risks which you and Worldwatch see and what to do about them.

Brian Halweil – Senior Researcher, Worldwatch Institute

Thank you. Before I do that, I will second, and maybe fourth, the point that's already been made – that we of necessity will be moving from a situation of short-term thinking to long-term thinking. Partly because it's not a moment too soon; we're at a period where interest in agricultural issues and agricultural development is recovering from being at a low, but finally it's inserting itself into climate discussions and economic development discussions and others.

But the other reason we need to change that perspective is that we're moving from a situation of agricultural stability – where farmers and others in the agricultural sector have been able to predict with some reasonableness what climate was going to be like, what water availability was going to be like, what the

growing situation was going to be like – we're quickly moving into a situation where those things can't be taken for granted, where we're moving from stability to unpredictability.

And, of course, the major driver in this case is climate change. Perhaps there hasn't been enough said about this over the last couple of days. Agriculture may be a relatively small industry in the global economy, but it is perhaps the industry that will be most affected by climate change and a more erratic climate. And it will have cascading effects in ways that we're only beginning to understand.

Of course, we've all seen the statistics that a one-degree increase in average temperature across much of the globe can lead to a 10-percent decrease in grain yields. But we're now beginning to understand that, in an atmosphere where there's a higher carbon content, plants are actually less nutritious. The carbon-to-nitrogen ratio in those plants goes up; that means less nutritious plants for the human to eat them and for the livestock to eat those plants. And we're beginning to see other effects that we haven't even anticipated in terms of – on the world's fisheries, we're seeing the range of major fishery species changing. From the bottom of the marine food chain up, we're seeing productivity decline.

So again, even if we just focus on the impact on grains, we've hardly begun to understand how the situation, the setting in which farmers and agricultural businesses operate, has changed dramatically. And it will be virtually impossible, I would say, to anticipate all of the impacts of climate change on agriculture. There are people in the audience here who have demonstrated that the incidents of new and harsher pest diseases will increase.

But even if we can't anticipate all of the different impacts of this instability, I would suggest that there is room for a collective response. So as we think about going from future risks to investing in hedging those risks, what I'd suggest is that we need to think beyond simply calculating global grain production, or what global grain production needs to be at, or what agricultural production needs to be at to meet demographic demands and future food demands. We need to think about incorporating diversity into the global food system at every level of the food chain – from diversity in the crop varieties we choose; to diversity in farming systems, that is, mixing livestock and aquaculture and water features on farms with traditional crop production; to diversity in the economics of farming, in the sense of giving farmers not just additional markets but additional products in markets.

And that diversity, at every level of the food chain, will be our best hedge against all of the sorts of threats that we can predict – but also those that we can't predict.

Joachim von Braun

Well, you may remember Donald Rumsfeld's legacy – that there are known unknowns and unknown unknowns, and thereby he popularized uncertainty. Your response is, we need more diversity because there's so much unpredictability in the food system. And I think that's an important approach. How about insurance, crop insurance? Would that fit into your concept? That would be a market-oriented approach.

Brian Halweil

Yes, most definitely. I mean, I'm not an expert in this, but my understanding is there's a full range of untapped insurance approaches for both poor and wealthy farmers to hedge against any sort of loss of crops.

But I suppose I'm thinking of insurance in a broader term rather than a policy that a farmer is buying. I'm thinking, for instance, of the late-blight outbreak that we had in the northeastern United States this year, which had not been seen in a while. And the causes of it were everything from a particularly damp, cold growing season to consolidation at various links in the food chain that supply home gardeners with tomato seedlings and potato growers with seed potatoes.

And the best insurance policy against dealing with something like that, which had a devastating effect on farmers throughout the Northeast, is a diversification of the sources of planting materials and the diversification of those crops that farmers depend on. Areas that only grew potatoes or only grow tomatoes were devastated, whether they had crop insurance or not. So I suppose I would define insurance a little more broadly.

And, to echo some of the points that were made yesterday by the keynote speakers, to think about the notion of investing across the value chain. I suppose that could be interpreted differently by different people. But if the majority of our investments, as they have been, have been at the sort of input side of the value chain – in terms of seed breeding, focusing on increasing productivity and profitability, by focusing on the inputs to production – then perhaps we've neglected all the rest of the links in the value chain, including the setting in which that seed is grown – the soil, the water-management technique, and ultimately the economic structure in which it's grown.

Joachim von Braun

You know, you have been living diversity, and you created these home gardens. Good things start in California, we know that; you were far ahead until the White House family started its kitchen garden this year. What motivated you? And let me not just make this a personal question; apparently thousands of households in North America, if not millions, and in Europe, have started gardening again. Seeds for vegetables and fruits were short in supply this year's season, and prices went up.

What's behind that? Is it back-to-the-roots and earth, and touching it? Or is there a general perception change happening? And what does this mean for our agenda in the developing world? Are people who are gardening themselves more open to our agenda? Is there an attitudinal change which can be properly utilized for making the agenda, which we have debated here for the last couple of days, more sustainable so that it isn't sort of a one-year thing, but keeps people engaged? Talk about yourself and this movement.

Brian Halweil

There is no question that this food enthusiasm that you see in this country and elsewhere could be harnessed for all of the goals of the World Food Prize. And, in fact, I think not just the environmental community but also the food-interested community in this country could be harnessed as a much more effective ally in international hunger issues and the goals of the World Food Prize in general.

The appeal of people planting gardens and shopping at farmers' markets and eating local, I think, is fairly universal. We were treated to a very nice Iowa-sourced meal at the Capitol last night, and I don't think we had to compromise anything, because we were eating Iowa beef and Iowa corn and pumpkin – I assume the pumpkin. And there was even Iowa wine, though I didn't get to try that. But it has become a very easy way for people to improve their diets in this country. It's become an easy way for people to start reconnecting with their children and cooking with their children. It's economical, in many cases. It reinforces people's concerns about trying to save energy.

Joachim von Braun

And do these gardens have to be organic?

Brian Halweil

No, I don't think at all. I mean, I think there's a strong argument to be made that many of them are by default, because at relatively small scale, as Hans and others can illustrate, it's not that difficult to control

pests and disease and weeds with nonchemical controls – and to invest in ecological science on your very small scale.

But to get back to your broader point, regardless of what motivates people to get interested in this – and it is in the tens of millions, as far as the American Home Gardening Association has estimated – it generally results in more interested eaters, more interested food decision-makers. And these are the sorts of people who will not just buy fair-trade goods and support developing countries farmers in that way. But these are the sorts of people who will be interested in speaking to their elected officials about changes in American food-aid policy and changes in the Farm Bill and changes in world-trade agreements that are currently barriers or hindrances to reducing hunger and poverty in the rest of the world.

So even though the locavore movement in this country may seem very removed from the concerns of poor and hungry farmers around the world, it would be a missed opportunity to not try to harness that enthusiasm for international issues.

Joachim von Braun

I envy you. I confess that this year, because of overextended travel burden, the IFPRI director-general's home garden fell apart because of missed weeding seasons. But, J.B., let me come back to a serious point on risk. I think we need a seriously reconsidered approach on the risk strategy that deals with market risks, with technology opportunities, with an investment portfolio.

Do we have a comprehensive approach on the table to deal with these increased uncertainties in the world food system? And if not, what's missing and what should be higher up in the strategy to deal with risks and uncertainties? Because you're in the private sector – you know these uncertainties are very bad for business and make you hesitant to invest. Isn't that right?

J.B. Penn

That is true, but the businesses that are able to sort these out are the ones that survive and thrive, you know. So they're also seen as opportunities by some.

I think that Brian has made a couple of very good points, but one is that we are in a time when – my sense is that we're reexamining lots of things that we have taken for granted. And we, the global society, do that from time to time. I mean, we change our attitudes in pretty big ways about certain things; I mean, look at smoking, for instance, and how attitudes changed about that in a relatively short period of time.

So I think we're at a point now of looking at the global food system. I think we're assessing what's called production agriculture and what that system is and how it works. And we're also looking at organics in a new way. We're looking at home gardens. I think we're looking at the whole system. And again, against this backdrop, that everybody is suddenly coming to realize that we're going to have to feed 50 percent more people in just 40 years time and do it with about the same resources we have available today – that's a pretty sobering challenge. I just think that really needs to sink in.

And so I think that we are reassessing everything, as you suggest, and that we're seeing, with this new perspective, risk to the food system in certain places that we haven't seen before. I think we're going to reassess that. I think we'll see some evolution of the food system because of this risk assessment.

The other key point that Brian made that I would like to elaborate just a bit that relates to that is that there is a lot of focus. And especially in a conference like this, when we're talking about increasing food production and largely focusing on the developing world, we get focused on farming and on farm inputs. And we talk a lot about improved seeds and even machinery, thank goodness.

But I think when we're looking at meeting this challenge that we all know about now, we have to be thinking about the entire value chain as it relates to food. And we have to be thinking about productivity improvements – not just in crop yields but all across the chain and how we store the food, how we reduce post-harvest losses, how we process it; how we preserve and enhance the nutritional content; how we retail it, how we price it – all of those things, I think have to be examined. And we will have to have huge productivity gains in the entire system, not just in looking at crop and livestock yields.

I would mention just one last point. It's that, at the beginning of this conference, there was the introduction by the two CEOs [who] mentioned the Global Harvest Initiative. The Global Harvest Initiative is these four agribusiness companies, but one of the things that they're exploring is examining a new metric, a way to measure productivity growth for global agriculture – maybe do it regionally, maybe have partial-factor productivity measures along with total-factor productivity measures – but to address this productivity gap, to try to see, on an ongoing basis, if we are really producing more food with the same bundle of resources and if we're doing it in the farming side, in the processing side, in the distribution and the retailing side.

So that is something that I think is a different perspective. As you said and others have said, we have lots of indicators: all sorts of hunger indicators, all sorts of happiness indicators. But this one, I think, takes a different perspective and focuses on productivity, which again is output divided by input. And you want to expand the numerator and hold the denominator the same. And it gets to Marco's notion of sustainability – you've got to work that in as well as these other things.

Joachim von Braun

Thank you very much for that point, J.B. Total-factor productivity in developing countries is really what I would advocate we should focus on. Yield per unit of land, or output for labor day, or crop per drop are partial productivities – they're important, but they don't give the answer. The current total-factor productivities in agriculture are showing growth rates of about 1.5 per annum. And that's why we are in a food insecure world. If we don't add at least half a percentage point to that annual total-factor productivity growth, we can try what we want, with all sorts of food-security intervention packages and with food aid and so on; it will remain a very risky, unpredictable, uncertain situation because of the lack of supply.

So I just want to underline this as a key conclusion from this panel, that we need to focus on the whole package – which I think is coherent with what Hans and Marco have said. We have to look at productivity, sustainability productivity for the whole sector, and that is encapsulated in the total-factor productivity.

Ladies and gentlemen, I would like to engage you in debate with this panel from here on. And we still have a good half hour. Line up. There are two microphones in the room, and we try to be fair. You have a minute or maximum two at the beginning. When the line gets longer, as it currently does, the last ones will only have half a minute. And thank you for rushing.

I asked my panelists to take notes because we want to listen to you first and see if there are some scope for aggregating some of your points. Feel free to comment or to ask. And introduce yourself, sir.

Question

I'm Patrick Binns from Seattle, Washington; I'm doing work with Washington State University. I wanted to follow on the comment that Mr. Ferroni mentioned, that the Borlaug challenge should be extended to be intensive, sustainable agricultural strategies and techniques. And I think the critical element of this is – how are we going to further advance precision-application agricultural inputs? It's a big movement in the United States. John Deere is a very big leader – global positioning-driven tractors and fertilizer applications based on specific soil conditions of each field. This is great, but these are, like, quarter-million dollar technologies, plus.

I would like to have the panel have some comments on what can we do to further microdosing of water, microdosing of fertilizers, microdosing of locally produced organic compost and biochars and some other types of soil amendments – so that the developing world can actually do intensive agriculture but with microdosing of the resources that would be available.

Joachim von Braun

Great, great. As the symposium moves on, we want to have specific questions like yours. Go on, sir.

Question

My name is Dean Kleckner. I chair a group called Truth About Trade and Technology now, but my life's been spent in farming on my farm in northern Iowa. Brian, you mentioned early in your first statement, I wrote down, "Farmers need more predictability," you said – and many farmers do say that, I agree. Many farmers say that, but I disagree with the need for predictability, to be honest. Stable, predictable prices are just generally low prices. I made my money farming on unpredictability and instability. One year out of 10 I made a lot of money, and that's when I bought the John Deere or the pickup or we got a new refrigerator for the house, whatever.

In the unpredictable year – J.B., you're a great economist; I truly believe that. But John Deere wouldn't need you if we had predictable, stable, unvariable prices, because every year would be the same as the other one. Why would they need your predictions? Mr. Chairman, their reaction to what I just said.

Joachim von Braun

Lovely. Thank you, thank you. Sir, can I ask you to step back to the microphone and ask you a question? Sir, sir? Can I ask you a question? I have a question to you. Have you engaged last year in the commodity exchange market, in 2008?

Question

What about it, you mean? Yeah, I was engaged in it. I loved the unpredictability; the prices went up. Does it cause trouble in the world? Sure it did. But let me tell you, the prices this year are a reaction to last year's prices – they're down. I mean, us farmers react. You're European – let me tell you, the Europeans knew about subsidies. When they subsidized European agriculture, they got production up their yahoo, whatever that is. I mean, we react to higher prices by increasing production. But the year before that, when prices jumped up, is when I make my money. The next year, after I and all my neighbors react to planting more, getting a better crop, prices plummet. It's just one of those years that we have to live with.

Joachim von Braun

Right, thank you. Well, I've lived longer in this country than in Europe, but let me say many of the commodity exchanges elsewhere in the world shut down, so the optimal level of uncertainty we need to keep in mind. But I don't want to preempt what the great economist, J.B., would say.

Question

I'm Daniel Hillel, and I work now at the Goddard Institute for Space Studies, which is attached to Columbia University's Earth Institute. And I wish to respond to a statement made in passing regarding agriculture and climate change.

Agriculture in the past, and into the present, has been and still remains in many places a contributor to the greenhouse effect by depleting soil of organic matter and spewing out into the atmosphere carbon dioxide as well as methane and nitrous oxide. But there are new paradigms of agriculture which are now gaining ground – literally. And these allow this re-sequestration of carbon into the soil and, by so doing, contributing not to the exacerbation of the greenhouse effect but to its mitigation. And there is great potential for that, and because time is short, I can't describe them here, but anyone interested, I have some publications on it. Please come to see me. Thank you.

Question

My name is Bill Horan. I'm an Iowa farmer. The question, I guess, is what we haven't heard at the conference. I would like to hear a response from the panel members on the new paradigm of food prices being almost directly correlated with energy prices, crude oil, and what that means for food production and food costs over the next decade or two. Thank you.

Question

Thank you very much. Charlotte Hebebrand from the International Food and Agricultural Trade Policy Council. I have a question. It seems to me that the name of this session, which is tracking global progress – what I haven't heard a lot about is tracking developments on the global trading system. And perhaps, in the whole conference, we haven't quite heard enough. So next year I encourage Pascal Lamy to actually come here, and perhaps he should change the name of the Doha round to the Des Moines round.

I am curious about the reaction of the panelists. I mean, we do still have a highly distorted trading system for food and agriculture; how do you see us trying to address some of those issues? Mr. Herren talked about the very high subsidies and, Dean – I guess the problem there is that farmers also get paid when the prices are low in this country. So it's not just a question of reacting to prices. We do still have very high subsidies that have an impact on farmers around the world. We have tariff escalation; you heard the head of IFAD say yesterday that Africa contributes, essentially, 100 percent of the world's cocoa but is not able to process anything. Now, part of that is that they're dealing with tariff escalation. The other reason is that there's a very restricted sugar regime in many places in the world.

So just curious to get your take on some of those issues. Thank you.

Question

Thank you very much. Boniface Orum from Makerere University in Uganda. I've heard about small-scale farmers and women being 70 percent of the population or those doing the farming. I have not heard about the long-term strategy. Is it sustainable to keep these 70 percent of the farmers and women in the gardens as a long-term strategy? What impact will that be? So I want to hear, what is this situation, or what should be the long-term strategies for all these farmers? Because the land is being divided over and over until it is reaching proportions that are no longer tenable for agriculture to continue. So what are we going to do with all the growing population, and what is the future for them? Thank you.

Question

Yes, Phillip Nelson. Being selected the 2007 [World Food Prize] Laureate, Norman Borlaug and the selection committee gave me an opportunity and obligation to talk about a part of the food chain that I hear very little about, but I've heard all of our speakers mention it – and that's food losses.

You know, I heard at our luncheon that we're still losing as high as 50 percent of what's produced. The figures of 20 percent are certainly real. The question is, as we look at assessment and as you speak of

assessment, have we made progress in that? I would suggest that we have not. I studied with M.S. Swaminathan on a study team in the '70s in India. They were losing 20-30 percent and maybe even higher. This is in the '70s. I visited again this spring in India; they tell me we're losing 20-30, maybe 50 percent.

As we look to the future, wouldn't it make sense for us to have greater focus on reducing food losses and developing markets for those beautiful women that we saw in the slides in our previous session? They would like a little more money in their hand, and adding value to their products that they're going to produce more of, if we continue as we've discussed most of this session. So I'm asking – what's the assessment on food losses?

Question

Thank you. Chelston Brathwaite, Inter-American Institute for Cooperation in Agriculture. Let me first of all congratulate the panel and you, chairman. And let me say that I was indeed looking forward to this particular session, because I think it's very important that we begin to look toward the future –what progress are we making and where are we going?

There have been several reports indicating that by 2050 we will have 9 billion people. And I ask the question to the panel, which I think I have not heard addressed – What *kind* of people? When I ask what kind of people, somebody may say, "What is he talking about?" What kind of people are we going to have in 2050 in terms of income levels, in terms of demand, and in terms of age, the demographics?

We have seen, for example, in China in the last 15 years, 300 million people moving out of poverty and basically coming into the middle class. How are we going to feed the new middle class as we move into 2050? For example, will that middle class require wheat, rice, corn, potatoes, and soybeans – the five crops that we currently use as the basis of our diet? Or will they need new products? What kind of people will we have in 2050? What kind of demands will they have? What will be their nutritional needs? Most of them will probably be 100 years old. They probably wouldn't need wheat, rice, corn, potatoes, and soybeans.

Last question, Mr. Chairman, which came up earlier with respect to trade issues. Will the initiatives in the developing world, which we are supporting today, especially in Africa – will they be sustainable in the face of continuous subsidies in the developed world? Those are my questions.

Question

Joyce Cacho with Novus International; we are a global company that focuses on health and nutrition in the livestock industry. If we are talking about what we haven't heard here today – haven't heard over the last couple days – may I please put on the agenda, livestock. We have treated agriculture and agricultural production in the crop-only dimension for decades. I call this "the dish running away with the spoon." Let's not have that happen again with the renewed focus on agriculture.

Secondly, about partial indicators. Without taking a look at agriculture in a comprehensive sense – so the way we at Novus look at sustainability; in the people, the community and the economic sense – then you start having a myopic view. The rush right now around carbon footprinting, water footprinting, is really looking at agriculture with one eye closed. It has a lot more value to the world, quite frankly, than just in a carbon sense, in a water sense. I'm calling for a renewed effort to look at agriculture in its holistic sense – what does it mean for livelihood? – and wrap that into, tie that into alternative uses for agriculture.

This leads me to climate change in agriculture. Part of the food-price hike – we've heard about trade. But certainly it was in great part because food crops went to – there was an unholy alliance, excuse my calling it that, between the energy sector and the agricultural sector. We're going to get into bed together – well, we won't go much further with that. But we need to look at agriculture and growing crops on marginal lands, bringing lands previously thought to be unarable – the way in which the Brazilians brought in the Cerrado

into soybean production – and bring that on board for energy production, as well as giving carbon credits for sequestering carbon to African farmers and farmers in general in the southern hemisphere.

Lastly, can we please, can we please step back from talking about developing countries and developed countries? Folks, we're in a market era. All countries are either emerging markets or developed markets. Thank you.

Question

Craig Rickard with CropLife International. My question gets back to a saying we're all familiar with, which is, "The best cure for high prices is high prices." And I think that's applicable to producing food. It's high prices that brought the world's attention to agriculture; it's low prices that have been blamed for hindering improved productivity in places that need it most. It's agreed that high prices drive innovation, as our farmer who asked an eloquent question earlier – it drives production when prices are high.

So I guess my question is – we seem to have two competing ends here. Now, how do we bridge the gap between high prices and then the farmers', and the world's, ability that responds to those high prices again driving the prices down? Professor von Braun, if you could address that, drawing on the expertise of the panel, that would be great.

Joachim von Braun

Thank you. I'd be happy. Well, panel, this will be difficult. Let me try to make it a bit easier. Anything related to climate change, next session, which is on climate change. Hans, is that okay? Colleagues, other colleagues on the panel, if you have the urge to bring climate-change responses to the questions right now, be very brief.

Now, let's take some of the market uncertainty and price issues first. And, J.B., could I ask you to address those?

J.B. Penn

We've opened up a can of worms; we've opened up a topic that requires a lot of discussion to do it justice. But we're talking about some different things here, and I might just try to simplify a little bit. There are three things that we're basically talking about, and Dean was talking about especially: one is uncertainty, and another is risk, and another is variability.

Now, uncertainty is the unknown unknown; there's not much you can do about that. And risk is something that you can assess, and generally you can insure against it. And in the developing markets, Joyce, we have instruments for farmers to deal with that. We have crop insurance, we have the futures markets, we have forward purchases in sales. So there's a way to handle that.

I think what Dean is reacting to is the old regime that we used to have in this developed-country market, which was a heavy government involvement directly in production agriculture. We had price supports that acted as floor prices, and what that did is encourage production regardless of what the market was saying, regardless of what demand was saying. And the result was that we had huge stockpiles, and we had a flatline of prices, and that's what farmers didn't like. They didn't like the predictability of knowing that these prices were very low. They like the market orientation in which demand can express itself and be reflected in prices and in which supply can express itself and be reflected in prices.

And that gets to the point that the last questioner was making, I think, there – we're talking about variability. If we let the markets work, within reason, then we're going to have times in which there is some interruption of supply. Prices will move up – that will cause farmers to respond. They will produce, and prices will move

down. Demand is fairly predictable. I mean, it does go up when we have high incomes, as we've had over the past four or five years before the downturn – it goes up a little faster than otherwise.

But my sense is that that's what we're talking about related to prices and markets. Again, I don't think that was exactly the point that Brian was making. He was talking about uncertainty in a much bigger sense and a much broader sense, I think, than just markets.

Joachim von Braun

Thank you. Hans, why don't you take a few from the menu of questions – not climate change but others. Were there things such as – would you tackle that question about, Is that sustainable, women's 70 percent in agriculture? Did you look into whose labor it was in your assessments – sustainability of women in agriculture? Maybe broaden it a bit, the future of small-farm agriculture. We haven't addressed the structural issues here.

Hans Herren

Yeah. The report actually came out strongly in favor of developing new agricultural knowledge, science, and technology for small farmers and family farms. I think that was very key because we felt that there was a lack of appropriate science which is directed toward the women in particular and the small farms. So that the new research would really address issues at that level. And that's why I think we cannot just import, sort of, the science which has been done in the North on a different farm size to the South; we have to adapt it and actually to work with the people.

And I think one thing, Marco, you forgot to say before, declaring, "We need more science and technology." What we need is to marry this with the farmers' knowledge. I think that was a very big issue also in our report, that the people know best their environment. That has to be taken into account. And add to that science and technology – marry it, sort of work together on that.

Joachim von Braun

Could you take up the first, rather specific question on precision agriculture, GPS, for land use, water, and so on. You or Marco – is that field that you feel comfortable to comment on?

Marco Ferroni

Yeah, let me say something. Thank you. Let me say something about that. Certainly I agree with the importance of bringing farmers' knowledge on board. Actually, since he has raised this question, this is extremely important, and we should discuss it in the context of agricultural extension – a major missing area that has not been addressed adequately in the context of this symposium; if given time, I'd like to come back to that.

But precision agriculture, I fully agree – there is so much water, land, fertilizer, other inputs that are being wasted. To me, precision agriculture is part of that technological package that tries to rely on the full gamut of resources in terms of technology, science, management, and so on that I have been talking about.

Now, precision agriculture is also very much something that is linked with the whole question of risk, because risk management is not just crop insurance (and I do want to say something about crop insurance in a minute) – it's about managing your resources in the best possible way. So technology, again, comes in as indispensable; knowledge comes in and therefore, again, agricultural extension as absolutely indispensable.

Then we've got the whole question of diversification. And I very much agree with Joyce on the point about livestock. I happen not to know that much about livestock, so I do not pursue that point. But livestock is

important, diversification is important – and that is where vegetables and home gardening are coming in. I think that home gardening is a very good trend that we're seeing in this country and in Europe – of course, in Europe it's been in there for many years – because, in addition to potentially improving nutritional or having nutritional benefits, I think that there is a promise there in educational terms. If people do home gardening, they begin to learn and understand again where food comes from. And if we do that, then potentially that is the way into resolving that unholy debate and discrepancy between the productivity and the sustainability "churches" out there that, I think, do damage to our search for prioritization of what really needs to get done and how it needs to get done.

Vegetables are not only important in the context of home gardening in OECD countries. They're extremely important, and overlooked oftentimes, certainly, in the research agenda in developing countries. Vegetables – Dyno Keatinge is sitting there, the head of the World Vegetable Center, has coined the following term: "Vegetables – a potential pathway out of poverty." And I think that is very true, and we need to address this in ways that the topic deserves because we cannot – we must focus on the basics, which is grains and oilseeds and so on, but we also must focus on vegetables both not only for nutritional reasons but for reasons of exploiting their potential as a cash crop. Income improvements are essential for farmers to be able to adopt technology.

Now, I did want to say something about the private sector; can I come in later?

Joachim von Braun

We have to close in a couple of minutes. There will for sure be a chance to bring in more points in the next session. Brian, what's burning?

Brian Halweil

Well, I thought it would be very interesting to answer this question about who those 9 billion people will be. And my understanding is no one's really talking about 9 billion anymore. The United Nations' latest estimates – and they always revise them down; we've never predicted well how fertility rates drop around the world – are well below 9 million, will peak before 9 million and begin to decline. It's not to say that it's not continuing to increase by 50 to 60 million people each year. Nine billion, sorry; I meant billion. But I think, rather than say who these people are going to be, we should ask who we *want* them to be. And I think it's safe to assume they'll have much more diverse and healthy diets. And rather than wonder exactly how many of them will be employed in agriculture, don't we assume that whoever is in rural areas will be part of healthy rural economies? If there are productivity increases on farms, many people will not be working on farms anymore.

But hopefully there will be processing jobs and added-value jobs and agricultural-extension jobs and agricultural machinery and engineering jobs that are all related those robust rural economies. So I think it's safe to assume that, if our agriculture is more agroecological-intensive, much more knowledge-intensive, there will still be a demand for lots of people in the agricultural field. They may not all be farmers, but they will still be connected to farming in some way.

And it's probably also safe to assume that people will be eating more meat and seafood than they are, especially in poorer countries, now. And that's something that we also have to plan for.

In terms of microdosing and wastage, it's maybe best to see those points together – that, like the energy debate in this country, we can either try to drill for more oil or we can be more conservative in our energy use. And there's probably a tremendous payoff to investing in that side of the agricultural economy worldwide – reducing crop wastage and loss, but also loss of inputs that simply run off the fields and go into rivers.

And, yeah, finally, I was not talking about economic unpredictability. I was speaking primarily about climatic unpredictability; the fact that a rain-fed farmer ,who plans to have some rain in the spring after they plant their seeds, will not be able to plan for that in the same way that they've done in the past. And so, as Cary Fowler of the Global [Crop Diversity] Trust has said, we will need climate-ready crops and climate-ready farmers, crops that can deal with more unpredictable weather but farmers who have also set up their farms to deal with more unpredictable weather. Thank you.

Joachim von Braun

Colleagues, Bill Gates yesterday referred to a new publication, which his foundation has supported at the International Food Policy Research Institute. If you haven't picked it up yet, it's out at the IFPRI table. It's called *Highlights from Millions Fed: Proven Successes in Agricultural Development*. It, of course, relates to our debate today – progress. What are the ingredients to make progress? Technology (and not in microdoses), science and development investments, infrastructure, good policy, community-based approaches, and leadership. Those are the things which cut across.

But many of the 20 success stories presented in this brochure and the book behind it touch on issues which you have mentioned, which may have not had the comprehensive coverage which some of you would have liked.

I note that there is strong demand for emphasizing trade more at the next forum to address the price issues, the volatility, uncertainty and related risk issues. Not taking the fun of uncertainty out of agriculture, sir – I agree with you; where would we be? We would all be civil servants then.

But things went overboard the last two years. Whereas the average world citizen today can cope with the uncertainties a lot better than ever in human history, the poor have been left behind. The risks that have them exposed, have deeply undermined their livelihoods and have led to hundreds of thousands of incremental deaths among the poor due to the food crisis and the financial crisis – let's not forget it. It's not just some statistics of prices jumping up and down. It is the hunger statistics which relate to the poorest of the poor which have worsened, and it relates to the volatility of the issues, which we have to address.

I think we had a great list – especially also from the audience and from the panel in this session, of things which we need to address, missing one. We have a smart, new website; it's called foodsecurityportal.org, established a couple of months ago at IFPRI. And it searches the international media for what is hot. So it searches for words related to food and agriculture and security and hunger and so on. And what's hot there these days is the conflict over land – so-called land grabbing, land investments, the uncertainties, the political issues over land rights, water rights. That issue somehow surprisingly didn't come up today, whereas it is out there flashing red on this smart Web search site. So I would put that in addition there.

And I would like to close with two very positive assessments. The new role of the private sector, the panel echoed it, what we have heard from the private-sector leaders at this symposium is indicating breakthrough and makes all of us very, very positive and optimistic in the future. And secondly, the new emphasis of government, including the U.S. government, on food security. There's large investments with smart investments, with a lot more partnership, a lot more focus on women – all this is great news.

Let's not focus on what we have not discussed too much. Let's keep these two grand messages from the symposium in mind and stick with Norman Borlaug's mission – we have to focus, get the crops grown, and get the people to eat them. Thank you very much.