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TRENDS AND IMPACTS OF RISING AGRICULTURAL PRODUCTION COSTS AND RISING FOOD PRICES

October 16, 2008 – 10:00 – 11:30 a.m.

Moderator: Bob Thompson – Gardner Chair of Agricultural Policy, University of Illinois

Speaker: Rajul Pandya-Lorch – Head, 2020 Vision Initiative, International Food Policy Research Institute

Participants: Jim McCarthy – Marburn Farm, County Kildare, Ireland

John Powell – Deputy Executive Director, UN World Food Program

Jerry Steiner – Senior Vice President, Monsanto

Carlo Trojan – Chairman, the International Food and Agricultural Trade Policy Council

Margaret Catley-Carlson

Chair, World Economic Forum Advisory Council on Water

We're now turning our attention from the threat of fewer genetic resources for agriculture to the impacts of the recent spike in food prices, as well as farming costs. To lead this next session, I'd like to turn the podium over to Robert Thompson. From 1998 to 2002 Bob Thompson was the director of agriculture and rural development at the World Bank. He's a past president and CEO of Winrock International and a former dean of agriculture at Purdue.

In the '80s he served as assistant secretary for economics at USDA and as a senior staff economist for food and agriculture on President Reagan's Council of Economic Advisors. Robert Thompson is also a past chairman and one of the founding members of the International Food and Agricultural Trade Policy Council and currently the Gardner Chair for Agricultural Policy at the University of Illinois.

And he is going to take us through how we take some of these issues and put them into the current-day context. Bob, you have the floor, or the podium. Thank you very much.

Robert Thompson

Gardner Chair of Agricultural Policy, University of Illinois

Thank you very much, Maggie, and good morning, ladies and gentlemen.

Yes, we've come to the session on trends and impacts of rising agricultural production costs and rising food prices. To introduce this session, our presentation will be by Rajul Pandya-Lorch, who is the head of the 2020 Vision for Food, Agriculture and the Environment Initiative at IFPRI, the International Food Policy Research Institute. This initiative seeks to identify solutions for meeting world food needs while reducing poverty and protecting the environment.

Rajul has been an IFPRI staff member since 1987. She was formerly special assistant to the past Director General, Per Pinstrup-Andersen, who received the 2001 World Food Prize here. And currently she's chief of staff to the IFPRI Director General Joachim von Braun.

Rajul's research focuses on trends in and prospects for global food security with particular emphasis on Sub-Saharan Africa. She has facilitated several high-level general policy consultations as well as conferences on food insecurity and poverty. Rajul has been a co-recipient of the American Agricultural Association's 2002 Distinguished Policy Contribution Award.

Rajul, please come forward and set the stage for our conversation on trends and impacts of rising agricultural production costs and rising food costs.

Rajul Pandya-Lorch

Head, 2020 Vision Initiative, International Food Policy Research Institute

Thank you, everyone. Thank you, Bob, for a wonderful introduction. I would like to thank Ambassador Quinn and the World Food Prize Foundation for inviting me to participate in this event and to present the overview on rising food prices.

The Foundation has been indeed prescient on in foreseeing that there would be a crisis coming down the road. And in fact there were several institutions, such as FAO, the World Food Program, and even my own institution, IFPRI, that tried to give early warnings of this looming food-price crisis.

Unfortunately, those warnings fell on relatively deaf ears, outside of the practitioner group and the research group. I think on of the key challenges for us is how to reach the policymaker group and to keep that interest sustained. Gordon Conway yesterday in his presentation challenged us to think about how do we exploit the world food-price crisis even as prices begin to fall and there's a temptation to think, "Well, we managed to solve this crisis for the short term."

So I hope that during the conversation that we have later on, Bob, that we'll come back to this question, have we actually addressed the food price crisis when people think prices are falling?

The presentation I would like to make will address the following issues: What are some of the price developments and their causes? What are some of the impacts on the poor and the hungry? And outline some of the priorities for action.

I should tell you that it is intimidating to stand up here and talk about this when there are so many experts in this room, and there's a few who have already articulated this and know this so much more in depth. So I'll try and give an overview, and I hope that you will jump in and correct my mistakes later on.

We are experiencing the most sustained and significant increase in the prices of basic grains and food commodities over the last three decades. You will see that from the slide where prices have risen sharply, particular the last two to three years.

But I'd also like to draw your attention to the period in the 1950s and '60s and the early '70s where prices in real terms were higher than they are still today. And that, I think, is one of – the bringing down of the prices, beginning in the early to mid-'70s – I think is one of the greatest legacies of Dr. Borlaug: that with the Green Revolution we were able to bring down prices for a sustained period of time.

The new situation, the new world food situation, is now characterized by higher and more volatile prices. Since 2003, maize and wheat prices have doubled and rice prices have tripled, but the increase in prices is not confined to the cereal group. Milk, meat, and poultry prices, among other agricultural commodities, have also experienced price hikes. So I'm delighted that my colleague from ILRI is here, and I hope that he will also pick up on the implications of price rises in the livestock community.

One more line in this figure is that of oil. We also talked about the intertwining of what is happening in the energy prices with the food-price situation and what is happening in the global fertilizer prices. Gordon shared a similar slide yesterday, where we are seeing a quadrupling of fertilizer prices and again a slight comedown in the last few weeks or so.

What are some of the key sources of the price increases? I will focus on four of them today, and they're coming from both the demand and the supply side: income and population growth, energy and biofuels, agricultural response, and market and trade-policy responses.

Income and population growth. We are continuing to experience high population growth, and an increasing number of countries are also experiencing high economic growth. The combination of population growth and growing incomes, along with urbanization and changing dietary preferences as incomes rise, result in continued growth in demand for cereals and in growth in demand for cereals for nonfood uses, for feed uses and industrial uses. And you will see that the use of cereals for food has increased 5 percent, for feed by 8 percent, and for industrial uses 38 percent since 2000.

Energy and biofuels. Another key factor behind the rising food prices is what's happening to the price of energy. Price of oil rose from about \$30 a barrel to about \$140 and has now slid down to about \$80 a barrel. Why should we be concerned about the energy prices and the implications for food prices and agriculture?

The energy prices traditionally affect agriculture through the effects on inputs, such as fertilizer, irrigation, transportation. But they're also beginning to intertwine in terms of agricultural products being used as fuel. And energy prices are then affecting output prices and opportunity costs for agricultural commodities.

One of the key changes in the last five to seven years has been the policy changes, policy shifts, towards biofuels. And the generous developed-country subsidies – subsidies in the U.S., subsidies in European Union, in particular, but also in other parts of the world – that have distorted markets and shifted production away from agriculture for food to agriculture for biofuels.

In the U.S., as much as one third of the maize crop now goes to ethanol production, up from 5 percent a decade ago. And increased biofuel demand, we estimate at IFPRI, has contributed

to about 30 percent of the increase in cereal prices since 2000 – other estimates from the World Bank suggest that maybe as much as 60 to 70 percent.

In a sense this is a crisis we have created by ourselves. You know, the policy shifts that we made, I think, may have been made with good intentions, but they've had consequences that were not quite foreseen or were not quite taken into account. And I think for us one of the big challenges will be that, if you are serious about addressing this food-price crisis over the longer term, what investments will we make in changing biofuel policies?

On the supply side, response to the rising demand coming from income growth, population growth, urbanization, energy policies and the like, has been relatively show.

In recent years, as a consequence, we have quite depleted our cereal stocks. But in most regions we have already reached relatively high levels of reduction. Yields have been growing very slowly. There have been land and water constraints and underinvestment in agricultural innovation, and also inadequate agricultural banking systems, or finance systems, that allow people to take advantage of the rising prices and make the investments that they need.

We have also experienced weather changes, particularly the shock with the extended drought in Australia, the cyclones in Burma, and we could go through a number of these things. This is not unknown to this crowd. We've spent quite a lot of time talking here about agricultural responses and investments or the lack thereof that we are making in agriculture. Let me not belabor this.

And the fourth factor that I would like to bring to your attention is market and trade policy, particularly the responses to the rising prices. And what they set off then is consequences and exacerbating of an already volatile situation.

Many countries, naturally, have taken ad hoc steps to minimize the effects of higher prices on their domestic populations. This is rational on their part, but one of the consequences is that it adds much more volatility to the international market situation, particularly when markets are thin, such as in the case of rice.

Such market and trade policy steps include export bans, restrictions, price controls – which may reduce the risk of food shortages in the short term for the country that is imposing them, but then they make, as I mentioned earlier, international markets more volatile.

They also undermine trust, and I think that that is one of the key casualties of the situation that we have experienced – the undermining of trust, and the undermining of trust in institutions, the undermining of trust in contractual relationships, the undermining of trust in behavior.

And I pick up on Pamela's point; I think trust is a very fragile commodity, and it is difficult to build up trust, particularly trust among partners that were importing commodities from countries that were traditionally exporting, and suddenly falter – cessation of that availability of those products.

People, as we lose trust, engage in behaviors that are not necessarily productive for the global system. And I think for us it will be – how to build up trust in these global food markets will be a challenge that we will encounter in the coming years.

What then are some of the impacts of the rising food prices on the poor and the hungry? Before this crisis even unfolded, there were many, many people who were absolutely poor. About 900 million people live on incomes of less than \$1 a day. What I want to bring to your attention is that there are at least 160 million people several years ago who were “ultra-poor” – who lived, if you can call it living, on half a dollar a day. They are very vulnerable to increases in the price of food. Their numbers are growing, and most of the ultra-poor today live in sub-Saharan Africa, a region that is impacted quite significantly by the rising food price crisis.

Even before this crisis unfolded, the numbers of people who were food insecure or hungry were already at 850 million or so. This particular figure comes from a report that we released just two days ago on the Global Hunger Index. It is very new data, but this is data, I have to tell you, that was available before the crisis unfolded.

In this particular exercise we did, where we updated the Global Hunger Index, there are at least 33 countries that have alarming or extremely alarming states of hunger. Most of these countries are in sub-Saharan Africa and a handful in South Asia and Southeast Asia – further enforcing the point that sub-Saharan Africa is a region that is vulnerable, because of its already high degree of hunger, to the consequences of rising food prices.

FAO came out very recently with a report that estimated the increase in the number of hungry people since 2003-2005, again, in the early part of 2007 when the crisis was just unfolding. At that time they estimated about 75 million people have been added to the numbers of hungry people. We don't even have information of how many people have fallen deeper into hunger this year as the crisis really, really unfolded.

What are the impacts of high prices at the country level? There are some countries that gain – they are the net food exporters. They are countries that struggle. They are the net food importers. Many of the net food importers are in sub-Saharan Africa. In fact, many of the countries that are the most vulnerable are net food importers. But the impact on a country will depend, to a large extent, on the extent to which the global prices are transmitted locally and impact on the market domestically.

But then there is also the other side, you know, where people want to take advantage of the rising prices. And to what extent can they then benefit from the rising prices as a farm community and as others? That also is something that needs to be factored in – to what extent will the prices transmit down, in terms of incentives and in terms of mechanisms that allow people to respond to increased agricultural production?

Impact at the household level: The net sellers benefit, and the net food buyers are harmed. The bulk of the majority of the world's poor are net food buyers. Many of them are actually small-scale farmers who sell off their product as the harvest comes and then a few months later re-engage in the market to buy back the food. They are harmed.

The impacts of the high prices on the poorest are very much driven by their initial conditions. It is driven by the extent to which adjustments can take place in labor, in finance, in goods, markets, and so forth. And the thing I would like to draw to your attention is initial conditions.

To what extent, what proportion of your income goes towards purchasing food on the market? The greater the share of your income, or your budget, that goes to purchasing food in the market, the more vulnerable you are to higher food prices and the adjustments that you need to make.

What are the different types of adjustments people make, and what are the consequences of them?

One very major adjustment people make is cutting back on the consumption of food, cutting back on their meals, from three to two to one, cutting back on the quality of the food that they consume, and shifting to its less nutritious and cheaper foods.

Many households cope by withdrawing their children from school because they cannot afford the school fees or they want the children to earn income and supplement the family budget. In many instances, households sell off the productive assets and condemn themselves to greater poverty down the road because of the short-term coping mechanism.

One other thing I would like to address here is the gender dimension of this. And I appreciate that Pamela brought up the point. There are gender implications of this food-price crisis. We do not have the data, very seriously, we do not have data or information on who exactly is impacted within the household. But we do know from past work on crises and shocks that women are impacted much more than men. They're impacted because of their lack of access to property, or their very tenuous access to property, and because of the implications for their time, of having to travel longer distances to find cheaper sources of food or to spend time preparing foods in different ways that are time-consuming.

Gordon brought out the point yesterday, and I very much agree with him – food security is very much getting intertwined with other crises. We note over here food security risks intertwined with energy security risks and political security risks. More and more, what is happening in one area is spilling over into the other areas.

You will notice, for instance, that there have been at least, in about 60 countries or so, mass protests, some of which have been violent in nature. I struggle with this figure, and I think, Gordon, I would like to ask him that question, too – What is the role of health in this?

There is more and more research that one of the key factors that tips people into poverty or keeps them in poverty is a health shock. And I think we now need to really pay a lot of attention to health shock and food-insecurity shocks and then the correlation with energy and political risks. But I put that on the table – the intertwining of health shock, poverty, and food-security shocks.

Priorities for action. I do want to emphasize that despite prices beginning to fall down, the food crisis is not overcome. There is a temptation on the part of many people to put that on the back burner. It is not.

We at IFPRI have put forward what we think are the key priority actions that are needed. Two sets of packages: the emergency package, for action that needs to be taken now to have impact now; and the resilience package, for action to take now to meet the ongoing crisis and to build resiliency in the global agricultural systems to cope with the crises and to prevent them from becoming more volatile.

The emergency package has four items. Expand emergency humanitarian assistance. I hope that my colleague from WFP will talk about some of the actions that have been taken there. There has been a lot of investment now in expanding emergency assistance, but very frankly it is not something that is over and done with. And I think we have to keep that fire lit.

Eliminating the agricultural export restrictions. Our work suggests that these would reduce price levels by up to 30 percent or so and reduce volatility.

Fast-impact production programs in key areas to contribute to the supply response that is needed to address this increasing food demand and the food-price crisis in the short term.

And to change the grain and oilseeds biofuel policies – very controversial, but it could have a significant impact.

The resilience package: Calming markets, investing in social protection. Let me mention the investing in social protection here, because in a sense it ties in very much with the investments that we have made in nutrition, in school feeding, in reaching children. And if you are not able to take care of building resiliency in people and preventing them from having the long-term consequences on their nutrition, we will actually jeopardize our responses to the food crisis in the long term. Investments for sustained agricultural growth and to complete the Doha Round.

We know what the problem is, to be very honest. Many of you in the room have probably said: Let's not spend time talking about the causes of the problem. Let's not spend too much time talking about the priorities for action. In a sense, we are beginning to converge on those priorities.

But one of the things that this crisis, I think, has revealed to us all is that we really don't have that much information that is timely, that is accessible, that is accessible at needed levels of disaggregation.

People ask us all the time at IFPRI, "What really is the impact of the crisis in country X, on people Y? What data do you have? Can you give me the exact number? How many people have fallen into poverty or hunger or fallen out, no longer going to schools?" Or whatever. Colleagues, we simply don't have this information everywhere.

Quickly enough, another needed level of emergency: If we are serious about assessing the impact of this crisis – about designing policies, programs, interventions that are responsive where they need to be responsive to this crisis and can be adjusted, you know, so that we are making wise use of the resources we have – we do need to invest in information and monitoring systems that are transparent and accessible quickly and that don't spend three years or five years collecting data and analyzing it. We need to find ways to get this data relatively quickly.

And at the end, let me mention implementation of actions, to be sound, have to be country-driven and country-owned. If we're going to make a difference, we're going to make it at the country level. We need to prioritize, and we need to sequence.

And we need to pay for them. People are daunted by the cost of addressing the food crisis. The cost of not addressing the food crisis is much higher – and you're going to pay for it in years and years and years to come. Let us pay the cost. Let us see it as an investment, and then the payoffs are going to be much higher.

Gordon alluded to the governance architecture, and I would also like to pick up on his point. There is a fundamental shift underway in the global food and agricultural systems. Are our governance systems, the international architecture, keeping up with this shift, responding to this shift? Or are we going to use our old architecture to apply to the new problems?

And finally, I reiterate the point, we are making investments, or we hope we are making investments, in addressing the food crisis. Let us find mechanisms to make sure that we monitor those investments, that we are accountable for those investments, and that they actually make a difference with those investments to the lives of poor and hungry people around the world.

Thank you very much.

CONVERSATION

Robert Thompson

Thank you very much, Rajul, for giving us that launching pad for our discussion in this session. To respond to and discuss the points that Rajul has presented, we have a diverse group of international leaders whose backgrounds and positions give them each a unique view of higher food prices.

First I'd like to invite to the podium Jim McCarthy. Jim is with us from County Kildare in Ireland where he owns and operates Marburn Farms. Jim also farms land in Argentina and has a dairy operation in Missouri, and earlier this week participated with 25 other farmers from Africa, Asia, Europe, Australia, and North and South America in the Global Farmer-to-Farmer Roundtable organized by Truth About Trade and Technology here, just preceding this meeting.

With his international experience in agricultural production and the discussions which he and his colleagues have entered into this week, Jim will be in a good position to add to our discussion perspective of how farmers in developing and developed countries feel about the market realities for food and agriculture as they look to the future.

Next I'd like to invite John Powell to the stage. Providers of food aid in emergency and extreme hunger situations have also been impacted by higher food prices. John Powell is the deputy executive director of the U.N. World Food Programme, the world's largest humanitarian agency, which fed 86.1 million people in 80 countries in 2007.

John has been with the World Food Programme for almost two decades, leading the Strategy and Policy Division and holding leadership posts in Eastern Europe, West and Central Asia, in Pakistan, and in Asia and the Pacific. Prior to joining WFP, John worked with the World Bank's Latin American/Caribbean Division, and before that with the Australian government.

Jerry Steiner. Representing the private sector this morning, Jerry Steiner, who is the executive vice president for commercial acceptance at Monsanto, will join our group. Mr. Steiner's responsibilities include leading Monsanto's Global Corporate Government Public and Industry Affairs Units, as well as developing business with downstream partners in the grain and food industry. He is actively involved in the industry as chairman of the CropLife International Biotech

Strategy, the Council for Biotech Information, and he's a board member of the Keystone Center and the Corporate Council on Africa.

And finally Ambassador Carlo Trojan, who is chairman of the International Food and Agricultural Trade Policy Council. Please join us on the stage, Carlo. The International Food and Agricultural Trade Policy Council – a group which Jerry Steiner and I also belong – is meeting this week in Des Moines in conjunction with the Borlaug Dialogue.

Ambassador Trojan began his career in agriculture and trade with the Ministry of Agriculture and Food in the Netherlands. He joined the European Commission in Brussels in 1973, ultimately being named Secretary General of the EC in 1997. And from 2001 to 2007 he was the European Commission Ambassador to the WTO in Geneva and represented the EU in the Doha Round of WTO negotiations.

So I think you'll agree with me that we have a distinguished and diverse panel up here to discuss this extremely important issue.

Now, Malthus has been wrong for more than two centuries. He predicted the population growth would outrun the world's food-production capacity and that eventually starvation would constrain the size of the world's population. Malthus has been wrong for more than two centuries.

Instead of population growth being constrained by the world's food-production capacity, we had a 150-year decline in the real price of grain, after adjusting for inflation. This was particularly beneficial to the poor, who spend the largest fraction of their incomes on food, and also allowed them to spend more of their income on other goods, stimulating more rapid expansion of the rest of their respective economies.

But we've had stagnation in investments in agricultural development in general, and agricultural research specifically since the 1980s, as demand for food has accelerated from population and income growth, as illustrated by Rajul. But yet we're in a situation today where 75 percent of the world's poor live in rural areas, but the international foreign-aid programs spend only 4 percent of their resources on agricultural development. And governments of developing countries also spend only 4 percent of their budgets on agricultural development.

Now, the last two years' explosion in agricultural commodity prices and, in turn, in food prices, have had a devastating impact on the poor in developing countries because they spend such a large fraction of their income on food. But with this rise in income, farmers in grain-producing and -exporting countries at least for a time benefited significantly from higher incomes; but more recently with the explosion in the cost of fertilizer and energy, they've seen their net incomes shrink significantly.

So with the decline in agricultural-commodity prices off their peaks in the last year or so, as we look to the future, there are huge questions from both the farm-producer standpoint, as well as from the international development perspective, of, "Will we get agriculture back on the global agenda to address the longer-term growth in food supply?" But also, "Will we respond adequately to the short-term crisis?"

So I'd like to call on John Powell, initially, that with this period of higher-than-historically-normal agricultural commodity prices, what are the challenges being confronted by the World Food

Programme? What are you doing differently? How do you see the next few years as your responsibilities are met in this unrolling environment? John?

John Powell

Deputy Executive Director, U.N. World Food Program

Thank you very much, Bob, and it's a great pleasure to be here with you again.

Let me begin with a couple of facts to try and locate the issues for us and then explore a little more detail the challenges that WFP sees and how we are proceeding to try and meet those challenges – of course, always in collaboration with such great partners as the colleague from the institution on my left, IFPRI.

Let me start with a bit of good news, because this is going to be a lot of bad news. The good news is that, for the last 40 years, we have managed, we have managed to reduce the percentage of those living in hunger by 50 percent. We're now at 7-8 percent – that is an extraordinarily achievement. Forty years ago nobody would have believed it. The world is now nourishing more people than at anytime in their history. That's also good news.

But we have a series of challenges, which are in fact much more tightly interrelated, perhaps, for a humanitarian agency such as WFP than might at first have seemed the case. Let me just spend 45 seconds on climate change.

The number of natural disasters has quadrupled in the last couple of decades. There are more; they are more frequent. They affect, according to the research, more than 250 million people a year each year since the year 2000. Ninety percent of those people are in developing countries. If you live in a developing country and you are a poor person living on marginal, fragile lands – and guess what? That's where the poor do live – then climate change isn't an issue for 2050. Climate change was here yesterday, is here today, and is here tomorrow. That's the arena into which come high food prices.

We began with 850 million people, last year, not having enough to eat each day, every day; 162 million living on less than 50 cents a day. Then you have food-price increases. Now, in this country and most of Europe, you spend 15 percent of your income on food. In these countries, for these people, you are spending 60 to 80 percent of your income on food. Now your food price goes up 50 percent, 180 percent.

What do you think that means to you? You have no choice, as Rajul says. You have to take your child from school. You can't afford the books. You have to avoid going to the health center. In rural Pakistan since the start of this crisis, we now have one-third of the folk who are ill going to health centers; it used to be 6 percent. That withdrawal is simply a function of the inaffordability of health.

The same for nutrition – you eat less meals, less nutritious meals. What does that mean? Well, for the pregnant woman and the small child, it means you pass on the inheritance of hunger between generations. The impact is extraordinarily. These are not numbers – these are people, every one of them with a name, a face, and an aspiration. And if hunger had a face, it would be the face of

a woman. So the gender issue in issues and conversations about hunger is not a cross-cutting issue – it is all but the issue.

For WFP we began the year with a very substantial program of work, all of the emergency operations you see – Sudan, Afghanistan, etc. The program of work at that stage was estimated to be \$3.1 billion to reach the circa 90 million people. Within a few months that number had increased to \$6 billion. Part of that is cost increases – fuel and food. Most of it is more people needing help. That's what it is. It's the Horn of Africa; it is Somalia, in particular; it is North Korea; it is Afghanistan – before you get to the somewhere between 75 and 150 million new people affected by high food prices.

Why did I begin with the 162 million on less than 50 cents a day? Because the 75 to 150 million high-food-price folk are “on top of” – they're not “as well as,” they're “on top of.” That's why – and please forgive me that I speak the way I do, because this is urgent. It's not something for future research. It is urgent, it is now, and it is real for real people.

At the WFP we've had a mixed blessing, in the sense, that one of the elements behind high food prices is very low food stocks. That means we're living in a post-food-surplus-dispersal world. That means our partners are increasingly giving us cash to buy food. So we are now much more cash than food. We can do more things. By more things, I mean 80 percent of the resources we get – cash for food – we purchase in developing countries, which is a real opportunity to leverage your purchasing power.

We will have a side event later which talks about how we're going to take that a step further and how to connect small farmers with markets – by offering multi-year contracts and fundamentally changing the way in which we do our procurement business in developing countries.

With greater access to cash, we can have a more nuanced and robust set of interventions. If there is food in the market, and the problem is income, then the answer may be cash or coupons or vouchers. We are now able to do that. We are able to look at more nutritious foods, particularly targeted to the young, the pregnant woman, and small children.

So while the challenges are enormous, this is a great opportunity to really grab it.

Thank you.

Robert Thompson

Thank you very much. Rajul and John have passionately laid out the challenge that the increase in food prices has rendered in increasing household food insecurity of the poor in particular. But the rise in food prices, in agricultural-commodity prices, has also sounded an alarm in many people's mind that we may be approaching a problem of global food security. Some even have suggested that Malthus could end up being right in the 21st century, even though he was wrong in the 19th and 20th.

So we turn to the question of, can the world's farmers in total produce enough food fast enough, or increase production fast enough, on probably little more land and perhaps with less water than today, in a world in which agroecosystems are shifting?

Now, we have both a farmer and a research director here, and I'm going to start with the research director. Jerry, Monsanto is one of the world's largest agricultural research institutions, with investments in agricultural research each year more than double that of the entire CGIAR system. If world food demand doubles, and we rely on agriculture for part of our energy security, can productivity grow fast enough in the coming years for the world's larger population to be fed better than today at reasonable prices?

And after you've addressed the question, then we'll turn to Jim as representing the world's farmers to address the same question. But let's talk about the technology basis. Is it going to be available?

Jerry Steiner

Senior Vice President, Monsanto

I think the answer is going to be yes, and we've made a very broad and public commitment on doing this on increasing and doubling yields of corn, soybeans, and cotton by 2030. And we're putting the resources behind that – \$3 million a day is what we now spend in resources to accomplish that goal.

I think it's worthwhile going back – one of the slides that Rajul showed talked about the declining rate of yield growth, and that's absolutely true. And if you looked at the statistics from, I think, 1980 to 1999, and you looked at those same three crops, the average rate of yield growth had declined to less than one percent per annum across that 20-year period.

But if you look at the ten-year period then, the last ten years, 1998 to 2007, you can see that there is some hope on the picture here because that yield growth, in that 10-year period, has now boosted significantly. Corn is, I think, 1.65 percent; cotton is well above 2.5 percent, largely because of the role that insect-protected cotton has played in yields; and soybean, a little bit lower than corn.

We're now seeing a lot of these technologies, and really it's both in breeding, where genomics and markers are allowing us to accelerate that rate of yield-gain, combined and integrated with biotechnology, where we can turn that potential that's inside that seed into a harvest that the farmer can actually realize. And both of those working together, of course, with improved practice, better disease protection, all sorts of other manners right there, to make a dramatic increase in yield.

And if you look in the U.S. right here, you know, corn yields are up 32 bushels since the introduction of biotechnology in 1996. It's a pretty significant yield gain. And that's really just the start of it. When we take a look at all of the tools that are available today, Bob – including drought tolerance, better use of nitrogen – we are very, very optimistic that across these tools we can make a really big difference.

I think when we connect this to the global picture, it's perhaps one of the most important points. We're not just talking about making a difference in the U.S. or Brazil or Argentina or Western Europe. This has got to make a difference in Africa, in Central America, in Asia – and it absolutely can.

And I think that's one of the most important facts that we need to shine light on here. I've traveled to Africa a number of times; I know a lot of people here have, or even live there. And I

think the relevance of the price of corn in Chicago to someone growing maize in Kenya isn't necessarily so high. And that isn't what causes – in my opinion, an awful lot of the issue with hunger is that we're not producing enough locally, and so many of the people that are food net buyers should be food net sellers.

And that we as an industry, really in the private sector here, are going to have to think about business as unusual – because this isn't the easiest place in the world to do business. But we need to find a way for these same improvements to make a real difference in these farmers' lives. And I believe it absolutely is possible.

The case of Malawi in the last three years is a phenomenal story, where the total country's production has more than doubled with some relatively simple steps. I know it isn't just about technology and better seed and fertilizer and crop protection. We also have to connect these people to markets. And that's where it's going to take some unusual partnerships to make that happen.

Lastly, we made a partnership. It's actually a 10-way partnership, so it's as complicated as they probably get right here, in our program with women. That's where we have taken our drought-tolerance technology and donated it. And the Gates and the Howard Buffet foundations are funding it and working with CIMMYT and the national research of a number of countries in east Africa so that we can get improved maize varieties there, so we make it less risky for the farmer to put in the inputs like fertilizer and produce a better crop.

Robert Thompson

Thank you very much. Well, Jim, you farm on three continents – in Europe, North America, as well as South America. You have one of the broadest perspectives probably in agriculture in those regions, all of which are important suppliers of food to the world market. But yet you've probably enjoyed the benefits of at least transitorily high prices of your product. But the price of fertilizer and energy have exploded in the last year. How do you see the future, and also how do you see the capacity of the world's farmers to double food production in the next 40-some years, and do it on not much more land and maybe even having less water available worldwide?

Jim McCarthy

Marburn Farm, County Kildare, Ireland

Well, Bob, the initial euphoria of the increase in grain prices over the last two years was very short-lived because of the aftershock of the input costs and increases. And I think it was a very timely warning, because the world of the farmer had changed and changed ultimately – because when you got a price increase in the past, it came from supply problems somewhere in the world; now it's come because of demand, and that demand is continuing to bump up.

And the farming world is going to have to realize that the food price and the energy cost are so totally related. High energy costs, high food prices. End of story. So we are going to have to revisit the farm-production model completely. And my vision of the farm-production model is that we would have GM crops completely, because GM crops facilitate no-till. And let me give you an idea of some of the benefits of no-till.

We can establish in Argentina a crop of maize – a crop of corn, as you call it – with six liters of diesel per hectare, and a conventional system in Europe is taking 30 liters of diesel. Now, it goes farther than that.

No-till, people confuse, with direct drilling. No-till is about a crop rotation, and it's about sustainability and the land acting as a carbon sink. And wherever we develop agriculture in the world, whether it's in the poorest parts of Africa, this is the way agriculture is going to have to develop – that we are going to have to get a much bigger return for every dollar we spend on energy. And that will be done with GM crops.

And I feel, I must say, ashamed to be a European to see the European stance on agriculture. It will not allow GM; it is doing everything to reduce production still. In Ireland what we found is this huge scheme called the Rural Environmental Protection Scheme, whereas basically they will pay you to cut production, to reduce nitrogen rates. And, you know, it is living on the past glories of surpluses in Europe. Our world has changed utterly. And Africa looks to Europe, and Europe is a very bad lead. Africa needs to look to Asia, because Asia in the next 40 years is going to add on another China. And if Africa has surplus, that's where it'll go.

As addressing the problems in Africa, Africa is 10 percent of the world's cropland, farming land. But what we have to do is we have to go in and solve the hunger problems that occur today and the day after. But we are going to have to have a complete change in the dynamic of helping Africa. We have to educate every farmer in production, in sustainable production, not in slash-and-burn, in rotations, and in farming with the least footprint that we can on the environment.

I'm very excited about meeting the challenge, Bob, but we've got to change the way we think and change the way we think utterly. And academia, I think you are failing to lead this change that's needed quickly enough. Especially academia in Europe – you are not speaking out about what is needed.

Robert Thompson

Thank you very much, Jim. Now I'd like to turn to Carlo Trojan. Carlo was ambassador of the European Community in Geneva, to the WTO, for a number of years. You witnessed up close and personal the WTO trade negotiations, the Doha Development Agenda, or the Doha Development Round, is supposed to facilitate more rapid economic growth in developing countries to lift the maximum number of people out of poverty. There's a great deal of frustration in the developing world on the extent to which this can possibly be a development round if and when we bring it to conclusion.

As Rajul pointed out, there's been a huge erosion of trust in many developing countries in the ability of the world market to ensure countries' food security, net food importing countries' food security, after they saw the shrinking availability of food in the world market this past year as market prices rose and a number of exporting countries limited exports or restricted exports.

So how do you see both the evolution of the world agricultural trading system, both the policy environments and influences? As well as, how do we reassure net food importing countries that international trade can reliably help provide the food security of those countries in the future?

Carlo Trojan

Chairman, the International Food and Agricultural Trade Policy Council

Well, thank you, thank you, Bob. First of all, may I recall that the mission of IPC is promoting a more open and equitable food system. That has been our mission for the last 20 years, and I think that that objective is still valid nowadays. But most of the trade environment has become more complex, and the issues have become also more complex.

And we have been dealing today and yesterday, and tomorrow we will be dealing, with the new challenges: rising food prices, food security, climate change, environmental needs, the competition between food, feed, and fuel. And all those things have become increasingly complex. And on top of it, global support for trade liberalization is fading, is weakening. That is the effect we have to live with.

Nonetheless, I think that it is important to continue to pursue a more open and global, equitable food system, especially in the situation where we are now, that we are on the brink of a prolonged recession worldwide, possibly, and that temptation for protectionist measures in such situations, and we know that from the 1930s, is very, very great.

I would concur with Rajul that we should not be misled by the recent falling food prices. I personally think that the period of cheap food policy is over, that we are moving into a structurally different situation. From a supply-driven economy, we are entering a demand-driven economy. And you have mentioned yourself the main reasons for that – population growth, economic growth, changing diets, etc.

I think that we will go through a period of relatively high food prices but relatively high volatility as well. Well, that is both the threats. And John has mentioned some of the most severe aspects of it, Rajul as well. But it is also an opportunity. It is an opportunity to invest and invest heavily in new production methods in agriculture, especially in developing countries. And let's be frank – agriculture has been neglected in poverty-reduction programs; agriculture has been neglected in development cooperation policies of the major donors. It only was with food prices that people wake up and that the World Bank issues a yearly report for the first time in 25 years on agriculture. So I think that this is an opportunity.

Now, as far as trade is concerned. Rajul has mentioned it. Rising food prices have given way to all kinds of export restrictions. I think, more or less, 40 countries in the world have operated export restrictions and export levies of all kinds. And that has contributed quite a fair amount to the rise in food prices.

I think that the international community, and especially the WTO, rather than doing what it has been doing for the last 20 years or 50 years, looking only at the import side of world trade, that we should also look at the export side of world trade. So I concur fully with Rajul on that point.

Secondly, I concur with her that we should look very critically to the present biofuel policies. I think we should promote, to the extent possible, second-generation biofuel feedstocks, and we should discourage first-generation biofuel feedstocks, and especially those feedstocks where the impact on greenhouse-gas emissions is questionable. So we should promote a transition from the first generation into the second generation.

And thirdly, I do agree with her that we should try to conclude the Doha Round. Under present circumstances, probably, it is not possible to do that between now and the end of the year. But we should certainly continue to aspire doing that as soon as it is politically possible.

Robert Thompson

Good. Thank you very much. Now, it seems like we have two critical issues on our platter. One, 75 percent of the extreme poverty is in rural areas, and most of those people earn their incomes in agriculture; and, as Rajul indicated, probably the majority of them are net food buyers. On the other hand, we have the challenge of perhaps as much as doubling world food production in the next several decades on little more land and probably using less water.

Is there any fundamental inconsistency between the objectives of agriculture addressing the poverty problem, and also achieving the doubling of food production that may be necessary? Rajul, would you like to speak to that?

Rajul Pandya-Lorch

Yes, let me pick up on that, and then I want to pick up on one or two points over here.

Robert Thompson

Okay. I wanted to give you the chance to react, too.

Rajul Pandya-Lorch

No. There is no fundamental inconsistency. I think if you ask areas, as you mentioned, 75 percent of the poor are in rural areas, a very major source of improved livelihoods come from agriculture directly or indirectly. And I think we also have to accept that agriculture itself directly is not only what we should be focusing on but on the rural economy. And I think as we are investing in rural economy – can I pick up on building on Jerry's point?

Robert Thompson

Please.

Rajul Pandya-Lorch

And I 100 percent agree technology, I think, is – the potentials for technology are immense. I think what is missing at the table – not just here, but in our discussions – are finance people. How do we then get from the availability of the technology to the access to the technology? And I don't think that we have made the investments that we need in making finance options, bridging the gap from the microcredit, where we've been focusing so much of our energy, and the mega-programs. How does a small-scale farmer or a medium-scale farmer get access?

And I pick up on John's implicit point, at least one of the major innovations WFP has been making is this Purchase for Progress Program. What is very exciting about the program, and which I think a lot of us will be looking for is, in a sense, WFP's making a commitment to purchasing over a period of time and making a secure market possible.

And I think that brings back the point of – How does agriculture, and how do the ones to make agriculture a viable option are able to make secure purchases? Because I think farmers in developing countries are like farmers everywhere. They want to take advantage of these high prices, and they want to participate in it. But how do you take the risk, you know, if you only have secure access to the market for one year?

So I think there are a lot of things we want to look forward, but I think financing has to be at the table, and ways in which you are able to have more security to farmers.

Robert Thompson

Jerry, I read the body language that you'd like to react.

Jerry Steiner

Well, I think it's absolutely the right point right here. And clearly microfinance has lagged in agriculture versus the Grameen Bank kind of model and a lot of other industries. And it doesn't need to. There are successful examples today of where this gap is being bridged. There's a program that we're involved in in Mexico, Campo Unido. And I think this is where Purchase for Progress can make a lot of difference, because the first part of someone being willing to make that loan to get a farmer started – and by the way, most of the money is fertilizer that we're talking about here. That's the single biggest input we've really got to get financed here. We can finance it against the crop – that's how it happens in many, many places in the world – but we have to cover, first of all, the risk, the climate risk. There's various models of ways of doing that.

But we need to organize, where the farmer has confidence that they've got a buyer and that they've got a buyer at a reasonable market price. And this is where – we've put a closed-loop system together in Campo Unido in Mexico in getting Maseca involved as a tortilla buyer and buying the grain. I think the World Food Programme could play that same role.

And if you go back to – I've heard Dr. Borlaug tell the story many times of what all happened in India to really make the success. And one of those elements was the government program of putting some confidence in the market price. So I think we've learned this lesson enough times.

And I think of it within our own company. We talk about “business as unusual.” We've got to find a way to make these markets work. Once we get that started and the farmer starts earning a return for a couple of years, this turns into a normal, sustainable business model. And that's where this all has to go. It can't be, you know, we're doing some things on donations, lots of other companies are doing things on donations, countries are doing it. That's really important, to get it started; but it has to transition over to normal business if this is going to work over time.

Robert Thompson

John, I have a follow-up question for you. Do you sense that the countries in the developing world with which you work, particularly those which have been recipients of significant amounts of food aid on an ongoing basis, do you sense that agriculture is getting back on the agenda of those governments?

You know, a lot of us have been frustrated about the agriculture being off the foreign-aid agenda, off the World Bank's agenda for a couple of decades. But some of us have been particularly frustrated that developing countries themselves, with huge amounts of poverty, agriculture hasn't been on those governments' agenda either. Has the food crisis jarred them into addressing the longer-term as well as the shorter-term problems?

John Powell

Yes. The answer is yes. But it's not robust but a nuanced "yes." The nuance part is, in Darfur today, no one is thinking about agriculture. They're simply thinking about survival. In Somalia today, that's all they're thinking about. And I have to tell you in DPRK, North Korea, we're not talking about these kinds of things either.

For those countries of a different kind, in a different situation, then there is enormous interest and enthusiasm for a resurgence of investment and policy reform in agriculture. There has been enormous enthusiasm, for example, for the Purchase for Progress initiative, which is wonderfully supported by the Buffet and Gates foundations.

It has the prime-ministerial engagement – this is the kind of level that we're talking about; because for them, for many of these countries, if you just step back a little – and I'm sorry to get into numbers – 450 million small farmers multiplies to about 2 billion people on the planet.

If we can find ways to genuinely engage small farmers as part of the solution, then we're a long way home. If not, my goodness, we have an awful lot bigger problem than we started with.

So there is enormous enthusiasm and commitment to engage in the way you were suggesting. To make the Purchase for Progress work, we have to deal with very small farmers. There are issues of quality of product; how do you ensure that? There are issues of bulking up, so there is sufficient possibility to purchase. There are issues of forward finance, credit, to be able to get the fertilizer and the seeds.

All of this can be done, but we have Dr. Ngongiri from AGRA, who is one of the key partners in this exercise, along with the World Bank, the International Fund for Agricultural Development, Food and Agricultural Organization.

So all of those really add great leverage to the resurgence of interest in agriculture, which has been brought about by, at least in part, by higher food prices.

Robert Thompson

Okay, Jim, I'd like to come back to you. One thing that came through, in the development of global warming or global climatic change earlier, is that we've probably entered a period of greater risk to farmers with increasing incidents of extreme events, from flooding one year to droughts the next. We have perhaps entered a period of greater volatility of market prices.

What's the situation of risk-management tools, both for large and small producers? Do the farmers of the world have the risk-management tools they're going to need? Or is there a role for public policy? I'm thinking of it from both the standpoint of large producers like yourself, but also smallholders who may be living at the margin of subsistence. Any thoughts on that?

Jim McCarthy

Yeah. Risk management is certainly something that's poorly managed at every level in agriculture. I think it's poorly managed. As one of my great farming mentors said, "You know, in farming we plan 15 years ahead, but we farm from day to day." And that's a lot of the trouble.

What we're seeing, Robert, is, to our great envy in other parts of the world, the consistency of American harvests in recent past. And we feel it's because of the technology that's come with triple stack and different things. So those risks seem to be, with drought or with too much rain, the American harvest seems to become very, very consistent. And that's the wonderful thing that the technology is bringing.

What is a very big concern for me – and Dean Kleckner was speaking last night with, I remember, the roundtable of farmers that were brought here by Truth About Trade and Technology – he was saying, "A free market; someone has said there's no such thing as a free market." The problem is that in the last 10 years the amount of paper that's traded in the grain markets is enormous. I mean, go back to July when grain prices were at their peak. There was probably \$40-50 billion worth of paper written, contracts for grains, that these guys are never going to buy.

So what's evolving in the world is, there are two grain markets. There's the futures market in Chicago, which shunts a lot of paper around, and there's actually the checkbook in the way in which you buy your grain. And that's becoming disjointed as well, which is becoming a big risk and hugely adding to the volatility of prices, and which is going to be devastating for those people with less than half a dollar a day – because they cannot afford to fund the guys in Chicago.

Robert Thompson

Carlo, will you have anything to add in terms of the policy, the role of public policy in this area of risk – really risk avoidance? You know, historically the European Union has followed policy that provided great stability to internal prices. But yet, as you've moved towards less amber-box and more green-box support, more of the support that's not linked to production-specific commodities, you've significantly increased the risk that your farmers confront with increased volatility of prices that they haven't historically managed.

As we've seen, the developing-country farmers have been perhaps particularly hard-impacted in those places where there are smallholders. Do you have any sense of how – what's the likely response in the future, in the public-policy environment, to this greater risk perhaps than we've been in?

Carlo Trojan

Well, I think that we have to continue to move away, as we have been doing in Europe, from trade-distorting subsidies. And I don't think that we should come back to the old policies, which we had in Europe to an extent and we also still have in the United States.

What you may still need in agricultural policies in developed countries is to have a mechanism, I would call safeguard mechanism – if you have very abrupt movement in the market, that you put some kind of floor in the market.

And personally I think also that, as far as Europe is concerned, and if you look at the kind of income compensations which we give – and it’s a technical term, and which are put in the so-called “green box” – I think that over the years, if it is true what I think is true, that farmers will get more return from the market because you have a changing world market, that in that situation there will be also a reduction of the kinds of income compensations which we are giving in Europe.

QUESTION AND ANSWER SESSION

Thompson I’d like to open it up to the audience. Please move to the microphones in the middle aisle if you have a question. First one right here. Please identify yourself first and indicate to whom you’d like to address your question, if you would.

Question I’m Pat Binns. I’m working with Washington State University. My questions are particularly addressed to John Powell and Rajul. In the procurement or Purchase for Progress program, I’m sure you’re stimulating the development of farmer associations and coops. Are you also looking to leverage those associations with further capacity building that would enable them to do, both in building and then owning and operating, community-scaled biofuel and biofertilizer production facilities so that they could have greater management over some of those important agricultural inputs?

Thompson Rajul or John – who wants to go first? John?

Powell Thank you very much. An excellent question. At this stage, our ambition is to be able to have a series of pilot programs to establish that we can, in fact, make the connection between small farmers and markets, particularly through cooperatives, farmers’ associations, and so on.

Our thinking had been, a little bit ahead of where the pilot is, that there should be no reason in principle why, if we can make this work, why we can’t extend that to agroprocessing – the production of micronutrient and vitamin-fortified foods, specialized foods particularly designed for use by women and small children.

So the ambition extends beyond the already-ambitious start, which is, how can we better connect small farmers to markets? We’re very concerned as we run this series of tests and pilots in 17 countries to make sure that we have a series of viable models before going to the next step.

Thompson Okay, thank you. Now, we have about seven people lined up to ask questions. I’m delighted that we’ve stimulated so much interest out there. If you’d keep your question to maybe a minute to a minute and a half, or comment, and let’s ask the panel to collect the questions, if you make note of, and so we get all the questions and then address them and each of you have a chance to respond. Because otherwise we’ll never get to the back of that line. So, madam?

Question Victoria Carver from the Iowa Soybean Association. I’m struggling with the point that I hear made, almost accepted today, about the impact of biofuels on the hunger

problems. And I just want to ask you to think critically about how that contradicts some of the other points that you make.

First of all, I think, you, Mr. Thompson and Rajul, you also mentioned that the real price of crops has actually gone down considerably. If you had the same increase in prices for crops today from 30 years ago that you had for other products, we'd be paying \$30 a bushel for soybeans.

So the farmer is not really realizing an increase in price for those crops. Isn't it a good thing to have demand increase prices for the potentially growing agricultural sector in developing countries, as you mentioned?

And secondly, you address it as the impact on grain prices. I'm struggling to see how the increase in corn and soybean use for biofuels impacts wheat and rice and other food grains. And actually soybean increases in oil for biofuels result in a greater availability of the protein for the fuels. And in our country, in the United States, we found that the increase in biofuels has actually resulted in 40-cent a gallon less [in the] price for fuel, which, as Mr. McCarthy said, is a major factor in the increase of the cost of production. So these are all kind of conflicting to me.

Thompson Thank you. We'll respond, we'll respond. Ma'am, please introduce yourself.

Question My name is Angela Cabal. I'm from Colombia, one of the developing countries you are talking about. I want to just make a very short point of view from a developing-country farmer.

In Colombia, we have to deal with, like any other farmer, we find a variety of uncontrollable variables, which are the weather, the diseases, the prices in states, and fertilizers and so on.

But also we have to deal with another cause that probably isn't on any of your agendas, which is security. Okay. In Colombia, in order for us to get some corn, white corn, out as a crop and a yield, we have to put security, since it is 90 days old until you harvest. Okay? So that's another cost that is involved, in Colombia at least and many other South American countries.

So, on top of that, there is a lot of risk that as a farmer we have to deal with. And that risk goes around from the beginning when you start and on until the end when you harvest, so we are talking about six months. So the risk, got to be related to a cost.

And to add to that, to the top of all this – in Latin America, there are no subsidies. The farmers, we are not subsidized. It's not like in the developing countries, in U.S., in Europe – there are subsidies. In Columbia we are not subsidized. The farmers have to manage their own cost and all of that.

So all that I want to do is to give you a different view of the thing about the rise of the price. Really, what in Colombia happened with the rise of the price is that actually it has increased jobs because there are more corn crops. Okay? And actually

it has given us the possibility to access technology, which you are all talking about – access technology. So now we have access to GM seed and all that, and we are also able to implement it, given our excellent weather conditions. Instead of having two crops per year, now we are thinking, we are making huge investments to go from two crops a year to three crops a year.

So I just wanted to give that point of view.

Thompson Okay, thank you. I just realized that there actually are two lines, there are two microphones. So the gentleman at the front of the next line, and then we'll come back to you...

Question Does the mic work?

Thompson Yes.

Question Yeah, we've been patient back here. Basically, I've been talking to a lot of African Colleagues. My name is Paul Sugg. I work in the area of sustainable agriculture in Uganda with a number of NGOs out there. I was here at the last Food Prize conference and raised a point and still don't quite hear it addressed this year either.

We've talked a lot about technology, and we talk in terms of systems when we look at agronomic systems development. What I think that we need to look at – and I'd like to hear the panel address – is the overall systems-design approach that's going to approach the real issue, and that is income security.

We talk in terms of food security. We're not going to achieve food security by targeting food security. We're only going to achieve food security by targeting income security and defining income security by going above and beyond mere cash income.

If we have a 500-percent increase in yield, what good does it do us if we flatten out the price in every African market 95 percent the same year and nobody's got the incentive to grow that crop?

One of the key issues we need to look at is market and infrastructural development and putting that within a systems-design approach of production technology that's going to be at the capital-intensive, labor-intensive level that the smallholder farmers can find means of affordability where there's going to be a cost-benefit analysis that's going to help the guy that's really in question – that guy and that woman called the smallholder farmer.

We have to stop treating this guy like a peasant farmer. He's not. He's an entrepreneur waiting to happen. We need more entrepreneurial incubators. People have been talking "value-added agriculture" in the United States, and I still don't see anybody doing it – but we're going to have to do that in Africa if you're going to have biofuels work.

We need to get past the idea of too much government regulation where there is a bias put in towards keeping businesses small and we can't go to the next level and take advantage of economies of scale. We need to look at optimality.

And where is there an emphasis towards a market-infrastructural, systems-design approach that's going to put the smallholder farmer in a better relationship in the commodity-exchange process to increase their remuneration? If we do that, and we can do it with local food, we can decrease malnutrition, we can stop kids from dying in their tracks – and that's where we need to go.

And I think you're going to have to do that, or none of the technologies that we have are going to be cost-effective inputs. Without supply-chain development, your input prices are going to be all over the ... place. If we can overcome that, then we can start increasing the overall profit to the farmer, and that's exactly where we need to go if you want to solve a food crisis.

Thompson Thank you very much. And also adjust the poverty problem. I'll take one more from the second microphone and then come back to the first.

Question Yeah. I'd like to come back to one of the impacts of rising food costs, and this relates to the effect of quality, which was described a little bit. But one of the other consequences of that is that it actually – and we've the data that shows this – it increases exposure to the microtoxins, because people end up eating what they would normally throw away, or they take their chance.

And the health impacts of this are just something that no one has realized. We've got data, and it's publicly available, which suggests that as much as 45 percent of the HIV epidemic is driven by aflatoxin. Now, that is a surprising statistic.

But when you look at it beyond that, the people at the bottom of the pile are exposed to aflatoxin, which mitigates some 43 percent of the... disease. Those are things that are not being addressed and they need to be.

Thompson Thank you very much. Food safety is definitely a huge issue.

Question Yes, Cheryl Jolly-Nagel; I'm a fifth-generation farmer from Saskatchewan, Canada. And like most young farmers back in Canada, I feel a tremendous pressure to carry on a hundred years of our own family-farm tradition. And in my very limited experience in agriculture policy, I've come to note the glacial pace at which changes in agriculture are made. And therefore I have to view this crisis as an opportunity.

And it's not my intention to downplay the tragedy of poverty, nor the seriousness of the market volatility we're experiencing right now. But it is my vision for the future of agriculture that we'll include generating some excitement in the next generation of producers in order to aid in the challenges that we're facing. And I can't in good conscience apologize for benefiting from the rise in commodity prices, however little they were. And you can label me a capitalist if you will – I prefer "opportunistic."

And my challenge to you will be to continue to relay the message of what the crisis around the world really is, while at the same time enabling those of us who are trying to be cheerleaders for this age-old profession to continue to be excited about what this industry offers us and how we can participate.

Thompson I'll take one more brief comment from the first microphone, and then we're going to have to close the queue because I'm getting the signal that we've got less than five minutes left, and I'd like to give each of the speakers a chance to react to some point they've heard or make another point that they'd like to get on the table in short order. So, yes, but for a brief comment, please.

Question My name is Gloria. I come from Uganda. I am working as a frontline extension worker with smallholder farmers. And these are farmers who have a quarter of an acre of land and at most three acres – that's the average land size we're talking about.

So when we're talking about technologies to improve and double food production, I'm wondering whether you are taking into consideration these farmers. And when you're talking about the farmers, those are women. They don't have access to the land. They do not own the land.

And if you look at the technologies that are being introduced, they are very expensive. Even the improved seeds are very expensive; these women cannot afford it. So what change do you expect to find from these women? We are talking about GMOs – and what happens if these technologies fail?

Because these seeds also need fertilizer, they need other chemicals. On the other hand, we are talking about organic food production, and you cannot grow these improved seeds without using fertilizers.

Another concern is about food aid. I come from a part of the country where people have been depending on food aid. And food aid has grossly suppressed local food production. Many of those people who get food aid cannot go and dig because they know world food aid is going to bring us corn and maize and cooking oil. But those are products which the local people cannot even eat. They'll go back and sell it in the market and go to buy something which is local.

So can there be initiatives to promote the local food so that those are procured and supplied to the people who are famished?

So those are the two concerns I have. And then on microfinance briefly...

Thompson I've got only two minutes left.

Question We women are not considered for microfinance, so how can you make change if these people cannot access microfinance? And yet they are the farmers, they are so-called farmers, who are not looked into.

Thompson Great. Thank you. I'd like to give each speaker a chance to say a last word, and it can't be much more than a last couple of sentences each, because we are basically out of time. But, Jim, what would you add to anything you've said before?

McCarthy I think that Gloria's description of her needs in her area is the question that has to be addressed in Africa. It's helping farmers to farm. And I think, Gloria, that funding has to be given for seed, because can you imagine the women in your area – if they could get a seed that protected their crop from all insects and pests and it actually maybe took in some nitrogen from the air, that they wouldn't have to buy inputs? Yes, they would have to buy the seed, but the seed, I dare say, could be subsidized. One bag of that seed will feed a hectare, and they may produce 2-3 tons of corn with very little effort – and what a difference that would make.

So I would beg for the authority of the thinking people to start the aid at your level – teaching the men to fish, not giving them fish.

Thompson Okay, thanks, Jim. Quickly down the line.

Steiner I think a lot of points have been made here that farming is a business like any other, in that it needs to be profitable. But it's – farming is something without a roof over the top of the factory, and therefore it has lots of elements of unpredictability. Technology can help with some of those, but, you know, you hear a lot of things on the policy front that we also need to fix to take out some of that risk.

There was a comment on the systems and supply-chain approach, and I think that we – and I mean collectively all the people in this room representing different places – need to really work to put some of those systems in place, value-chain systems, that I think will address many of these challenges.

Thompson Okay, thanks. Anything else, Carlo?

Trojan Yes, just one remark. Recently in the context of rising food prices, in quite a few quarters there has been a tendency to say, "We should be self-sufficient in terms of food." I don't think that it's the right answer. I think if we want to ensure food security on the longer term, we need more trade and not less trade.

But at the same time, and that is the opportunity we have out of this great crisis, we should take all possible measures to enhance the production, especially in developing countries and especially in a great continent like Africa.

Thompson Good. John, briefly?

Powell First, we have to be able to be smart enough to do two things at once. The first is to provide emergency humanitarian assistance to those who need it. And the second is – high food prices offer an opportunity, perhaps the first opportunity in decades, for small farmers to get a fair price for their commodities. What's wrong with that? The issue is how we take advantage of it.

On the Uganda question, as I know our programs in Uganda, they're heavily focused in the north of the country, where there was the extraordinary situation concerning internally displaced people as a result of some conflict, and fundamentally on AIDS programs. The point you make, though, is very well taken, which is why WFP purchases very substantial quantities of food in Uganda for use in our programs in Uganda and in other countries in the region.

Thompson Thank you.

Pandya-Lorch Thank you. High prices are not inherently evil. And I think I'd want us not to walk away with that impression. For many years, we have all complained about low prices, and the high prices provide us an opportunity. The challenge for us is how to take advantage of that opportunity and to protect those who cannot take advantage and who are hurt by the prices. Simultaneous action – but they are not an evil thing.

Thompson Thank you very much, panel, for stimulating presentations and discussion. Thanks to you in the audience for your questions.