

2007 Norman E. Borlaug/World Food Prize International Symposium
Biofuels and Biofoods: The Global Challenges of Emerging Technologies
October 18-19, 2007- Des Moines, Iowa

SESSION I. GLOBAL PERSPECTIVES

October 18, 2007 – 8:45 – 11:50 a.m.

Conversation with Speakers and Participants

Moderator: Nina Fedoroff

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Nina Fedoroff, Moderator

Fedoroff I'd like to invite the rest of our speakers to the platform. And maybe we could have some more lights, because I suspect there will be questions from the audience. We have about 20 minutes, 25 minutes. Excellent. I'll stay here and I'll mediate.

We've had some sober presentations and some passionate presentations. And to start off the discussion among our speakers, which is where I think we'd like to start, let me ask this. The devil is, in the end, in the numbers and the details. You have spoken about what the problems and what the prospects are; but, realistically, how soon and what fraction of the energy demand do you think can be met by biofuels? Or what fraction, and when?

Rodrigues As I showed in my presentation in one slide, the McKinsey organization has answered this question, saying that, if the prices of oil are \$40 per barrel, it's absolutely perfect competition, plain competition, biofuels and oil. But now the prices are \$86 per barrel. Then McKinsey says, with that price, you can mix 50 percent of biofuels and oil. This is the answer in terms of potential. I don't think that biofuels...

Fedoroff For your country or globally?

Rodrigues Global, global. This McKinsey is a global investigation, research. I don't think that biofuels, as I said before, are the only solutions for fuels and energy. But for me, it's important. It's what has been said by Ms. Visconti. There is an ending civilization based on oil. It's ending. We are going to another civilization. We don't know what. Maybe in hydrogen cells; we don't know what's coming. But people are researching worldwide on that. So we are here and have to go there. So, there is a clear and ready bridge on biofuels. Why not? Why not? This is the only point, I guess, is important.

- Fedoroff Other speakers, please?
- Rehman I would like to slightly differ on that. I mean, this is a point that I was making. It's not critical at the moment to look at merely numbers of percentages. It would be important, maybe more important, at the moment to look at the processes that are going in. So before we get into this aspect of whether it's going to be B-20 or B-30, or is it going to meet 20 percent of the oil demand or 15 percent of the oil demand, more important issues are the entire economics of it. What kind of practices need to be introduced to promote it? How can these practices be widely disseminated? What are the specific criteria on the social side, on the environmental side, on the economic side, that need to be put in place? Because if we are able to do all this, then I think that numbers are going to come naturally.
- But if we largely focus on – and this is one of the aspects in the policy and the strategy of the government also – we start talking of, by 2010 we'll have B-20, 2030 we'll have B-25. But where are the policies, where are the strategies, as the honorable minister earlier pointed out? These strategies need to be put in place. These standards need to be put in place. Once we have that, the numbers would come.
- Visconti Yes, I agree with you. There is a lot of emphasis, and it is absolutely great from developed and developing countries. But it's not only a question of number. According to my figures, according to business-as-usual scenarios, we have a percentage of around 10 percent by 2020. But here we need some strategies.
- We need stronger help from scientists before a second-generation of biofuel, and this is absolutely important in order to avoid the food versus fuel. And we need also to solve some problems at trade level, at global trade level, at certification level, life-cycle assessments. So I can say it's 50 percent, but then there will be a disaster from other point of view. So we have to take everything together in a balanced way for the future.
- Chen Yeah, I think it's difficult and risky to predict that percentage – some people say 10 percent, some people say 50 percent. Looking at United States and EU and China, there's big consumption for energy in terms of gasoline and petroleum and coal. I would say that at this minute, if we say, "\$80 per barrel, so we use corn or other crops to generate ethanol," it looks kind of practical, but it's very risky because the price of oil, it changes all the time. And I'm not really sure. Some people say \$100 per barrel, some people say it will be low down. That's one.
- Second, the cost in agriculture, especially because of ethanol production, so like the price of corn, soybeans and other major crops, will increase. So it would be very difficult to predict at this moment for sure that biofuel in terms of percentage will increase.
- Xingwana I think also what is important is what needs to be done to reach those numbers. We still have to modernize and educate our farmers. We still have to ensure that

in developing countries we have the rural infrastructure developed, because those are some of the challenges.

We do not have the resources to do these things in many of our countries. So, as I say, that is why in my country we have decided to start at the lower level because we realize the challenge, and we hope that we'll be able to grow every land from our experience and as we have more access to resources. Thank you.

Fedoroff I'd like to invite questions from the audience as well. Do we have microphones?

Q Good morning. My name is Margaret Ziegler. I'm with the Congressional Hunger Center, and my question is directed to Her Excellency Xingwana, but I imagine there may be some experience also from the other people who have presented. I visited South Africa with a group of our Mickey Leland Fellows in April of this year, and I had been there twenty years ago to South Africa, so saw a lot of change, positive change in the country. Congratulations on what the government has been accomplishing.

One area that we noticed, though, however – we visited many rural areas – was perhaps not as much progress in helping landless farmers who have been affected by apartheid increase their access to land, whether through direct ownership or through use. It seems to me that perhaps the bioenergy movement could be an interesting way to help landless farmers participate in a productive activity, both for food security and for energy needs.

Are you thinking about ways, as you mentioned earlier, that you're going to be opening up some marginal lands, how to help incorporate landless farmers into these programs? And I direct that also, open it up, to other countries that have spoken this morning. Thank you.

Xingwana Yes, we still have a challenge in South Africa where the majority of our people still do not have access to land. It's a legacy that we have inherited from centuries of colonization and apartheid that brutally removed our people from their ancestral lands. Now in South Africa we have what we call the restitution program, which is part of our land reform program. We are negotiating with the farmers to return the land that was dispossessed. To date we have returned 93 percent of all land claims that have been lost in South Africa. It has been a very expensive enterprise, a very difficult one to trace the families, some of them dead, and to get their beneficiaries and so on; so it has been indeed a very long process.

We also have, as part of our land redistribution and land reform program the LRAD program, where we are buying land for poor farmers who want to use land for agriculture. The Department of Agriculture trains them in this regard and has special schemes, such as CASP, the Comprehensive Agricultural Support Program, such as MAFISA, which is a small loan for emerging farmers and new landowners. And also we have the Land Bank, which gives small packages for

farmers who want to come into agriculture. We are launching a new program to fast-track the land reform process.

On Monday I will be in a part of the Western Cape where we will be buying land for farm dwellers and rural people who want to go into agriculture. And we are going to move into all provinces where we're buying particularly land within the eastern part of the country, which is fertile because of rainfall. But it is a process indeed; I agree with that.

For our people it has been a slow process. But we are trying our best to ensure that – because it's not only about buying land and giving people land, we also have to ensure that those farms become sustainable and successful agricultural enterprises. So we have to train them along the way. So we are launching the land and agrarian reform program, which will fast-track the land reform program in South Africa.

Fedoroff Does anybody else want to address that?

Q I'm Wayne McKay. I'm a farmer from Australia, and I've been very interested in coming to America and talking with other farmers and listening here today. But one of the issues that I saw raised today is sustainability or environmental impact as farmers. Now, farmers are frontline on the environmental impact. And basically in Australia we've set a very high standard. We have a problem or an issue with actually the regulation of high-standard farming in that all too often the costs imposed on farming impact on our ability to be sustainable.

Now, Europe is one of the examples where we actually produce beef on our farm. And there are two systems to producing beef in Australia. There is a system that produces beef for our domestic and Asian markets, and there is a system that produces beef for the EU. And unfortunately, because of regulations of the EU, we produce beef with a larger environmental impact for the EU because of the bans on technology – in that case, growth promoters.

There are many technologies well proven for forty years that can reduce the environmental impact on the land and on the world. We have to have more acceptance overseas, particularly for overseas markets, to allow farmers to be less or more sustainable and have less impact. And I particularly ask that people that are responding how they can more carefully review their demands on the supplying countries?

Fedoroff Good question.

Visconti Yes, you are completely right, and I'm not an expert on this specific question that you raised, but I'm trying to give you a kind of a general answer, so it will not be specific to yours, so I apologize first. It is a matter of harmonization, and we need to find a harmonized certification scheme for all our countries. Now, WTO could

be the place, but it's very hard to negotiate. Now we see that we are trying to face this problem at bilateral level, but it is not enough.

So it's a matter of harmonization. It's very tough. WTO could be the place, but I mean we don't have to be hypocrite, and there are so many scientific issues over there. But sure an effort in this respect has to be done, because otherwise we face a critical situation like the one that you described.

Fedoroff But in the end I think this is an incredibly important issue because it has to be evidence based, and it has to track with the progress of science if we're going to make any progress in greater sustainability.

Q I am B.B. Singh from India. I am an agricultural scientist, and most of my time was spent in Africa and India. First of all, I want to congratulate all the speakers for an excellent presentation and very good educational materials for all of us. When we look at the numbers, the total food production, global now in the world, is 2.2 billion tons and 6.5 billion people. If you divide it, we just barely have enough food to go around. And our projections in 2025 is about 8.5 to 9 billion people. So even in this house some of the presenters said that we have to increase food by 50 percent in this next 16-17 years, which is just near the corner.

So if we divert maize and soybeans and even sugar cane – Brazil is lucky to have so much land that you can grow sugar cane – but globally even sugar will be deficient 17 years from now. So what I'm saying is, this morning's presentations mainly dealt with ethanol and biodiesel. It is a good thing to give the signal that we must handle the fuel situation, but I think ethanol and biodiesel from maize and soybean is not the way. I think it has to come from the biomass.

And our major focus should be to increase yield by 50 percent in the next 17 years. Automatically biomass will increase 50 percent. And if we now double up technology to get biofuel from the biomass, the residue, also there are crop species that can produce 20 tons, 25 tons, of biomass in five, six months. So the focus should be more biofuel from biomass rather than food crops. Thank you very much.

Fedoroff So the question?

Q So I would like if there is any – where are we in terms of getting biofuel from biomass? Any research on that area? Thank you.

Rehman I think it is an important point, but equally important is to recognize that biofuel is not going to be about species. It is not going to be about maize or jatropha or different options. There are several options for producing good biodiesel and good bioethanol. And it would depend on specific reasons – location, geography, practices in a country – to choose from those options.

For instance, in India deliberately it has been chosen for biodiesel that they are going to depend on jatropha, and that's a conscious choice. But even after that choice, there are farmers who are actually going in with pongamia and other species. So in areas where it is going to come in direct conflict with food crops, I'm sure that other alternatives or other options would be tried out.

Also there are enormous amounts of advances and research that are going on and the last evening's exhibition was very educative in that manner. We have possibility of biofuels from algae, from biomass, also use of waste, plastics. So in all this amount of research, which is already underway to look at other feedstocks, to look at other options, and I don't think that should be an area of major concern – though in several countries, as you rightly point out, in areas where there is scarcity of land for agriculture itself, it ought to be an important issue. But there are solutions for it.

Chen Yeah, it is a concern, to use the crops or biomass. As I mentioned, because of problem, especially in the price of corn that's increasing, we are thinking and actually the plan is for biomass, especially we use straw from the rice or corn. And they are thinking about using the sweet sorghum and other plants as biomass for generating energy. But the cost compared to corn or to sugar cane is obviously higher. And so we need a policy from the government to subsidize that to use biomass. And this is very important also, technology – we really need the technology to have a high efficiency just by direct combustion or some other technology to generate electricity from biomass.

Rodrigues Agreed. I think that biomass will be the second-generation for producing of biofuels, and it's happening already, and not only that but let me give the example of sugar cane again, because it's what I can talk clearly about. Sugar cane produces ethanol from the plant. But now we can realize also the hydrolysis of the bagasse, and are producing ethanol from the bagasse. And before our sugar cane crops have been burned to be harvested. Now, by nationalization, it's more and more reduced the burning, the harvest of sugar cane.

Then there are a lot of leaves that remain in the land, and these leaves are also able to be converted to ethanol like biomass. So not only sugar cane produces ethanol from the sugar cane. The bagasse and the leaves also produce. They are biomass.

And on the other hand we are producing in co-generation electricity from the bagasse in São Paulo State. São Paulo State – when we are talking about Latin American countries, like about African countries, in general people think there is only one country in Latin America or in Africa. There are different countries, and São Paulo State is a very developed state, very much industrialized and a lot of cities. And in São Paulo State today 17 percent of electricity comes from the bagasse of sugar cane. So of course biomass will be an important alternative – I agree completely.

What is that? Biomass is agriculture. And again farmers will answer for the needs of the humankind. This is important. Biomass is agriculture also.

Xingwana Yes, I think in South Africa we have the example of soybeans, soybeans that we will be using for biodiesel. But at the end of the day, we have the cake which is used for feedstock for our animals, which at the end of the day produces beef, produces poultry. But I also want to say that it's not about the food crops or nonfood crops. It's about the land that is lying fallow and is not producing anything. In South Africa alone we have four million hectares that is lying fallow.

If we had the resources, the mechanization, and all these things that would assist us, I think we would be producing more than enough to feed everyone. In talking about South Africa, many African countries have got very fertile land. I've seen in Tanzania, I've seen in Zambia, in Nigeria – in most African countries, land is lying fallow. If all this land in Africa was utilized and we had the resources to produce in those lands and produce effectively, efficiently, like Europe does, like the U.S. does, nobody would go without food in the world.

Fedoroff Although all of these are very optimistic projections, I would like to remind people of Ken Cassman's talk yesterday. I think that there are huge challenges. The demands are, in fact, growing faster than the supply, and it will take a great deal of inventiveness, a great deal of resources to actually achieve these goals worldwide.

Q My name is Sergio Bortolozzo. I'm a farmer in Brazil, and I want to make a question to Mr. Roberto Rodrigues. What is your opinion about the technology of the question of industry of sugar cane in Brazil?

Rodrigues He asked me about the technology in both the agricultural area in Brazil and in industrial area of Brazil, including taking in account the issue of the environmental questions. What is happening that we are producing new varieties of sugarcane now, and there are indeed some transgenic varieties that are not liberated yet because of some rules in the legislation.

But we have already some new varieties that can produce 40 percent more ethanol per hectare than are producing today. Using the bagasse and the leaves, our scientists guarantee us that in ten years we will double the productivity of ethanol per hectare, not the production of sugar cane but ethanol; you can double it in ten years. So today you are producing 8,000 liters of ethanol per hectare; in ten years you can produce 15,000-16,000 liters. It's fantastic what's going to be realized in the agricultural side.

In the industrial side, there are also many improvements now. The capacity of the modern industries to get ethanol from the sugar cane is increasing a lot with new forms of extraction of ethanol, not only processing with huge equipment, which there is new equipment extracting more ethanol per ton of sugar cane. And more than that, the use of bagasse, and mills that are being improved now and the

electricity also, so much that we believe that the model can serve to any poor country, even to generate the electricity for surround of the producers of sugar cane and sugar cane mills.

So there is a strong development in research, but it's much less than we need, because private sector is not investing together with the state. We have a very good stations, like EMBRAPA, which is a fantastic enterprise for research but without enough money to double up the research.

So we are dealing now in GVF, in São Paulo, to organize some special enterprises for research, which is allowed by the utilization of innovations in technology, for which the private sector can be partner in special companies of state organizations do research to double up new technologies. And it's developing a lot for the near future. Thank you very much.

Fedoroff

Thank you. On that optimistic note, I'm afraid we have to stop the discussion. And I'd like to thank all of the speakers for their wonderful contributions and the questions from the audience. Thank you so much.