

2007 Norman E. Borlaug/World Food Prize International Symposium
Biofuels and Biofoods: The Global Challenges of Emerging Technologies
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SESSION I. GLOBAL PERSPECTIVES

October 18, 2007 – 8:45 – 11:50 a.m.

Speaker: Ibrahim Rehman

Nina Fedoroff

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Our next speaker is Mr. Ibrahim Rehman. Mr. Rehman is a Director of the Energy and Resources Institute, which was founded in 1974 with a mission to confront challenges in global energy and economic development both in India and internationally. The work of the Action Programs Division, which Mr. Rehman oversees, integrates and addresses issues of poverty and environmental degradation, focusing its research on forestry and biodiversity, renewable energy and extension in rural areas.

A 2000 British Chevening Scholar, Mr. Rehman has over 17 years of leadership in poverty alleviation, rural energy technologies, natural resource management and watershed development. His background combines training and experience in chemistry and social science, and he is a member of the Inaugural Steering Board of the Round Table on Sustainable Biofuels at the École Polytechnique Fédérale in Lausanne, Switzerland.

Mr. Rehman.

Ibrahim Rehman

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Thank you. Ladies and gentlemen, we in India gratefully acknowledge the eminent contribution of Dr. Borlaug, Dr. Swaminathan, and other scientists, that has been made in the field of agriculture, which actually transformed the Indian agriculture scenario. So it is indeed a great pleasure and honor for me to be here in this dialogue. And I would like to thank the World Food Prize, particularly Ambassador Quinn, for giving me this opportunity to be here.

Ladies and gentlemen, unfortunately, I'm not an agronomist. I also would like to confess that nobody in my family is an agronomist. But I assure you, despite this problem, I will speak the truth. And starting with the structure of my presentation, I will be talking very briefly on global perspectives, the driving forces in biofuels, some of the potential challenges that we face, some myths and reality, key issues, looking at the Indian scenario, risk and mitigation of these

risks. We at TERI are undertaking a major project with assistance from BP; I'll talk briefly about that. And finally, on the way forward.

As we've all heard from the speakers before me, biofuels is on the march and is receiving a lot of attention across the countries in different parts of the world. The reasons for this attention vary cross countries, across regions. Largely they emanate from the point of view of energy security. Secondly, on climate change, reducing pollution. And also on rural development, which is aspects related to farmers' income, agriculture, and enterprise development – the potential that biofuels offer in this regard.

Even though there is an enormous amount of trust in and emphasis on biofuels production, the overall production globally is still quite low. And if you see the scenario – I was talking to some people yesterday, and I was informed that in the U.S. biodiesel and bioethanol are primarily hovering around 5 to 6 percent of the total oil production. In China I believe it is less than 1 percent. We heard in Europe it's about 1.4 percent average. In India it's still much less, maybe .25 percent or even less.

So while there is a lot of emphasis, we are at the very nascent stage. We are at the beginning of this revolution. The projected biofuels production, however, for different countries and regions offers great opportunities, surely, in terms of looking at the oil crisis, the energy crisis that the world is likely to face if we do not find these kinds of alternatives. So by 2030 a substantial portion of fuel, it is hoped, would come from biofuels. And it could be B-10, B-15, going up to 10 percent, 15 percent, varies across the countries.

Currently, however, the scenario is not so rosy, I would say. It's not so conducive in certain aspects. As we all are aware, there are trade barriers, there are tariff barriers related to it, that are still not part of the WTO. And we need to resolve these barriers. There are issues with regard to cost and particularly in the developing countries.

For instance, in India we've been working out the economics. And whatever economics is worked out, in several cases if you don't have scale in terms of production and plantation, then the economics works out negatively for the farmers. So in such a scenario, because of the difference in the price of production of biofuel and diesel, the cost is negative in certain cases. And I'll come to that a little later.

Then there are issues of land allocation, of issues related to energy security and food security. These are concerns which have been highlighted, and as the esteemed speaker, the minister from Brazil, pointed out, these are maybe some voices of skepticism. But there is enough evidence and experience to show that these voices of skepticism, if not addressed properly, can be a big stumbling block in the march forward for biofuels.

We also heard yesterday the experience about GMO, where something which could have been extremely useful, and which is extremely useful, was, because of information, because of lack of information, because of misinformation, completely diverted into another area and into the wrong kind of politics.

So it is important that we take cognizance of these issues. At present there is no specific global custom classification; there are export subsidies for other crops. For instance, in India, there are enormous amounts of subsidies for other crops, which again distorts the higher potential of biofuels, because then the farmers are not more inclined to go in for biofuels then.

In India the standard excise duty on biofuels is expected to be about 16 percent. And as I said, high prices of biofuels and conventional fuels in certain cases are a big stumbling block to start with.

In certain cases, people are talking about what I said earlier about this conflict between biofuels and food security, the prices of food crops. And some of the concerns are not so alarming in terms, but the others are quite valid, and there are examples in China, and in other parts of the world, where biofuel production at least in the immediately and medium term has affected the prices.

Indonesia and Malaysia, which account for about 90 percent of global palm oil production, have recently set aside 40 percent of their crude palm oil output for biodiesel production, which in a way led to a shortage of palm oil as a food ingredient.

The Indian scenario is, as I said, we are just starting out in biofuels production. There is a ministry of rural development, and this is the interesting part – it is not the ministry of agriculture but it is the ministry of rural development, because of the enormous implications or enormous opportunities that biofuels offer in terms of development of the rural areas of the country, which has been designated as the nodal ministry for launching the national mission on biodiesel.

They have prepared a detailed project report, in which we at TERI were very intimately involved. Also, largely, the emphasis emanates from the fact that the integrated energy model reveals that by 2030 India will be dependent on imported oil to the tune of 95 percent. So it is imperative that we look at alternatives. And we would also be importing nearly 40 percent of the coal that we would require for energy generation. In certain scenario it's quite important that we find alternative fuels.

Hence, the rationale for the Indian biofuel agenda is more or less similar to several other countries. It's to reduce dependency on oil imports, to provide energy security, to create employment for poor, and to address global concerns related to carbon emissions.

It also becomes imperative because of the fact that India currently is enjoying enormous amount of growth – in terms of GDP growth, it's about over 8 percent. It's going to be one of the largest consumers of oil beyond 2006-2007. And though India has proven oil reserves, recognizing access to energy is a major barrier to rapid growth, and the Indian government has therefore put an enormous amount of emphasis on biofuels.

These are some of the predicted figures that we have for – by 2010, 2020 and 2030. So there is some amount of strategy which is coming into the biofuels sector.

They are expected to, it is said, and here I would like to draw the attention on the strategy part. The National Biofuels Mission says that they are to bring 40 million hectares of land under

biodiesel activity. This 40 million hectares of land is supposedly the wasteland in the country. And it would, assuming that this is done, it would lead to employment generation of about approximately 7,000 million man days, which is enormous.

Now, the problem here is that we who are pushing these biofuels sometimes get into the scenario of over-simplification. And in the process, because we get into largely macro-level numbers, then the strategies and policies evolve out of those macro-numbers. And this is true for several countries in South Asia and Southeast Asia, where potential and other things are being worked out in this manner.

The reality is that the wasteland that the Biofuels Mission is talking about is really not available. The entire wasteland is not available because, though it is classified in government documents as wasteland, it is under various uses. And when you go out there, this land is not readily available. So any assumptions which basically are based on this are not going to be true. So in this scenario, it is important to look at what is the functional, the practical reality, at the grassroots level.

Also – and I'm now largely talking from point of view of India – also we were told that jatropha is a hardy species that can be grown on any soil under any conditions. True. But here one is not talking about only growing jatropha. One is talking about seeds. One is talking about oil production.

Now, if this jatropha is grown on 40 million hectares of wasteland, this wasteland does not have very fertile soil, it doesn't have adequate water facilities. In certain cases it doesn't have any water facilities; most of it would be semi-arid or arid regions. In such a scenario, if jatropha is grown, yes, it would grow; it would grow as a species that has certain [inaudible] characters and which can survive in extreme climatic conditions, but the yields are not going to be there. And if the yields are not going to be there, then the economics is not going to work out. And if the economics is not going to work out, then farmers are going to suffer. And if all these things are not properly, carefully explained and taken into cognizance at the policy level, the entire biofuels program can receive a setback.

And so these are just two examples, and I can quote examples from other South Asian countries or Southeast Asian countries where there is enormous amount of hype that has been created for biofuels without really going into the details, into the details, the technical details, the agricultural-related details, the agronomy-related details, details related to the economics of it, details related to environment and implications of it.

I was reading some of the papers that were available yesterday in the exhibition, and I found that in U.S. and partly in Europe as well, there are certain criteria that have emerged. There are certain calculations that have been done.

For instance, on the environmental side, if I remember correctly, it's a reduction about 67 percent or something in that range. Now, what are the assumptions under that? What has been calculated for U.S.; what has been calculated in Europe? What are the assumptions? What are the criteria? These assumptions, these criteria need to be made available to other parts of the world. And the recent steering board that we are part of is precisely doing that.

So the key issues in front of us are: Package of practices are not standardized. And I'm talking again from a developing world perspective. There are packages of practices that are available maybe in U.S., maybe in parts of Europe, but the package of practices has not been standardized. And while these packages of practices are not available, there are concerns, there are myths, there are what the honorable minister pointed out, lies. There are all kinds of confusion created on it.

Specific social, environmental and economic criteria are yet to evolve. And these criteria, the economic criteria, have to be specific to a particular region. For instance, in India if we are talking of biofuels, we are talking of largely marginal farmers. We are talking of poor farmers who have got marginal lands, small land holdings.

If these are the people who are going to grow biofuels, then it's important that the entire economics of it is explained to them, and that they are aware of all the aspects of the value chain, and then they consciously get into it. They don't get into it because maybe tomorrow the government is going to offer some subsidy, there is some other arrangement, which is more short-term, and then there would be a Brazil kind of scenario: when the government program goes, then the whole thing will fall. And if that falls, then here as I said, are people – these are marginal farmers, these are farmers who have largely been cultivating for their sustenance. So rather than doing any good to their lives, biofuels will further end up in making their lives worse.

In several countries in South Asia there's no notification from government on expected yields. Key issues again: cultivation doesn't actually – things are not clear about protection of grower's interest; processing, protection of investment in processing facilities; marketing, sale, consumptions – these are issues that are still to be resolved. Until these issues are resolved and clear, it would be difficult to take the biofuels agenda forward.

Looking at farmers, risks and uncertainties for farmers. Complete failure of crop, very low. Delayed or low productivity. As I said, for jatropha, it has been predicted it would be 4 kg per annum, which is fairly optimistic, because in certain areas the productivity has been as low as 500 grams. So one has to really see and build this into the economics of it. Uprooting of plantations – so if the farmers don't get yield, if the farmers don't get the money, then they're likely to uproot it. And refusal to sell their seeds.

Options are: loan guarantees, contract farming, which is happening and which we at TERI have initiated on about 8,000 hectares of land. Formation of a farmers' cooperative – this is again largely coming from experiences in India where cooperative movement has really helped in initiating some new initiatives on the agriculture side. Soft loan to farmers and buyback guarantees, guarantees for purchase of seeds, arrangement of collection, selection of technology and economies for sale for transesterification. Categorization of biodiesel industry, which is still very nascent and we're not fully aware of, and duty and tax exemption for biodiesel industry again.

Now, we at TERI are involved in a major project, one of the largest in India, which focuses on production of biodiesel by plantation of jatropha in the state of Andhra Pradesh. And we are growing saplings in the nursery and these saplings are sold to farmers, and farmers are planting them on the field; and there is a buyback arrangement with the farmers. Then it is

expected that the seeds would be bulked to expeller unit and crude biodiesel then would be sent for transesterification unit.

20 million jatropha seedlings would be planted on about 8,000 hectares of land. Backward and forward linkages are being worked out with the banks, for instance, to look at finance, to look at support that would be required for the farmers. And until the end of this planting season, we have close to 2,000 hectares.

Some of the issues here we have introduced technology – it is called mycorrhiza, which basically binds with the roots and makes available nutrients from marginal soils, improves water use efficiency, disease protection, and reduces chemical fertilizers that may be required. This is something which has been produced at TERI and which is being used for biodiesel production.

Again, some benefits of mycorrhiza – 8,000 hectares jatropha plantation would consume about 21,840 Gcal of energy, while if you use mycorrhiza this would be substantially reduced. It reduces cost input by 30 percent, productivity increases by 5-15 percent, etc. Now, this is a photograph of the nursery that we have in place.

And the three kinds of models that are being undertaken: one is intercropping, boundary plantation, and block plantation. So this is an area where there is agroforestry, where there is horticulture already in practice, and jatropha has been introduced as an intercrop or as a boundary plantation, so as to enhance or augment the income of the farmers. This is intercropping with coconut, intercropping with sorghum.

Now, finally, looking at the way forward, what we found is there are enormous opportunities and challenges, both globally and locally. There is a need to identify these best practices, standard practices, criteria, and then convey the same to the people. Major issues of trade barriers, tariff escalation, need to be addressed. International policies should be framed in such a manner that they don't undermine opportunities for the developing countries. And this has actually happened earlier in several cases. And once this comes at the WTO, I think that would be an important issue.

Then there are issues in terms of research and development. There is a need for new technologies, for plant and derivative improvement, genetic improvement. One could undertake, because the amount of oil in a seed is a huge issue as far as economics is concerned, so one could undertake marker-assisted selection for oil and its yield. Value-added products need to find a market, for instance, in case of biodiesel, it's glycerol and oil cake.

In terms of biotechnology, and somebody referred to this, pyramiding of economically important traits is necessary so that you could identify the conducive traits. Developing plant varieties that improve oil content, quality and yield, and developing site-specific genotypes for different agroclimatic regions is important.

In India it's important that – design, development, and testing of microarray and selection of genes are important for oil production. Also, because jatropha is not having these, it's important that these are sourced from different areas and then the work on genetic improvement is undertaken on this. Thank you.