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## Module I—Opening Global Dialogue

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### Q&A

**MODERATOR: HELEN HAMBLY ODAME**

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*Alan Wildeman (University of Guelph, Guelph, ON):* The comment was made about major corporations now making intellectual property freely available to Africa and I was wondering if you could expand upon what the word “free” actually means. I’ve followed the discussion around some of the drugs for HIV, for example, and when you dig into it a little bit more deeply you find out that free is not necessarily free. Do you have any comment on the technology around agriculture?

*Kanayo Nwanze:* When the African Agriculture Technology Foundation (AATF) was being established, I was a member of the Design Advisory Committee until early 2002. My recollection: I will not mention the four major multinationals that are providing technologies to the AATF, but the AATF is basically serving as an honest broker. For instance, if one of those companies gives a construct to the AATF, the AATF will take on responsibility for any risks. This is quite a complicated setup, but it guarantees that companies that provide their technologies, in whatever form to AATF, are absolved from liability. And I also know that one of the clauses in the agreement in the setup of AATF that some of these technologies would not be made available outside of Africa.

*Ron Herring (Cornell University, Ithaca, NY):* There is one thing that everybody in this debate agrees about: there is going to be an enormous increase in social surveillance of agriculture, and I’m curious how you come down on the type-1, type-2 errors that we might make. That is, not knowing risk particularly of gene flow through agro-ecologies; we don’t know what these risks are. So far, they don’t seem to be very great. But, not knowing, what kind of biosafety regulations ought to be in place? The experience in Brazil, in Rio Grande do Sul, and in Gujarat of Bt

cotton movement of uncertified, unofficial seeds—both of these indicate to me that it's unlikely that traditional institutions are going to be able to become effective seed-police. I just don't see it happening. So the question is, how much ought to be invested in biosafety institutions and bioregulation? The type-1 and type-2 error is that if we make a very, very tight regime when it's not necessary we've wasted resources. If we make a very loose regime and there is some very serious threat out there of gene flow, then we have a potential catastrophe. Or we could have very, very tight regulation and we don't need it, or very loose regulation and we do need it, or very loose regulation and we don't need it. I wonder how you come down on this. Everyone wants the scientist to tell the rest of society what level of regulation and what kind of regulation is necessary. We're dealing not with risk, which has a probability distribution attached, we're dealing with uncertainty.

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*That is our strength as a species. We are very adaptive.*

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*Neal Van Alfen:* We have to look with an historical perspective at what we have done, and continue to do, to our planet. Clearly, our environmental standards are changing, and that's one of the realities that we face. Historically, we made a mess of things. Every place that we've moved to, we've carried our favorite foods with us and, inadvertently, our pests. So, rats are everywhere and disrupting ecosystems. Through our movement about the planet, we have created and continue to create environmental problems. Agriculture is part of this, and certainly we have to take responsibility for what we do, but as we do things we learn from our mistakes and we try to adapt. So, I would say that we continue to do the best job we can, recognizing that our standards are constantly changing; more is expected all the time and we ought to be trying to meet those expectations, those standards. Now, can we ever achieve perfection in that regard? I don't see that we will—there will always be things that we don't foresee—but I hope that we will continue to learn from our mistakes. That is our strength as a species. We are very adaptive.

*Ron Cox (Science and Technology Committee of the Ontario Federation of Agriculture, Toronto, ON):* I guess the previous person started into the idea of gene flow and from my limited reading I understand that research has been done mostly in Australia and New Zealand. I'm not aware of whether more research has been done in your own particular countries, but it seems that people don't seem to be concerned. Is enough being done with isolation strips and other mandated precautions? A lot of research is being done in greenhouses to prevent pollen escape. Do you feel that you are ready to expand further in your own particular countries?

*Van Alfen:* Is your question in terms of how great of a threat is the release of an undesirable trait into the environment through our experimentations?

*Cox:* Yes. I have seen roughly 1 to 2% and in many areas it would meet the European standard as well.

*Van Alfen:* Let me give you an example in terms of rice and red rice. There is a clear danger of putting traits into rice that can move to a weed, which is a very big problem in agriculture. Clearly, studies done on gene flow from domesticated rice to red rice have shown that it is modest. But gene flow occurs and so precautions are necessary. Sorghum to Johnson grass is one in which gene flow could occur very rapidly. On the other hand, there are examples of attempts to establish genetically modified organisms in the environment for pollution remediation and for biological control. The first example in the United States was the release of a microorganism to compete with naturally occurring ice-nucleating microbes, This was an attempt to establish a microbe in the environment for a positive affect. And essentially it failed. Another example is the attempt to establish a transgenic fungus in the environment that has a virus incorporated into its genome as a biological control agent for a disease of trees. Again, this has not been successful. So we cannot make uniform predictions about the escape of transgenes into the environment; some will be easily fixed into natural populations while others will be very difficult to establish, even if we want them to become established in a natural population Unfortunately a mistake could be made; therefore, each should be evaluated on a case-by-case basis, just as we do when we introduce new biological control agents into a region.

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*M.S. Swaminathan:* I fully support what you said. The major problem now in many developing countries—even in my own land—although we've made some progress, our infrastructure for looking at the problem in its many dimensions is still lacking. We have to build functional capacity and look at each case by case; it is very difficult to generalize at the moment. Maybe 10 years from now, as science progresses, we'll know how to handle it. But at the moment it is better to be cautious, take it case by case. It will involve a lot of money to understand gene flow, how far pollen travels and so on. And, in the context of India, farm animals are also important. Human health, animal health, the environmental health, all of them have to be examined. Take cotton for example, *Bt* cotton: cottonseed cake is used as animal feed then it goes into the human food chain. So, the number of tests you have to make is very considerable. There is insufficient infrastructure,

research infrastructure, scientific infrastructure. If this science is to do a lot of good without controversy, we will have to develop public confidence to reach agreements on mechanisms. There seems to be more public confidence in the regulatory mechanism in the United States. In my country, it remains far from satisfactory. People don't have full confidence. There has to be transparency in the whole mechanism of testing. It's complex. We have to learn from each other—how to do it right. Medical biotechnology—particularly vaccines—does not have the problems we see in the food-biotechnology area. There is much wider acceptance of biotechnological products in pharmaceuticals and medicine.