
Module IV—Ensuring Safe and Healthy Food

Q&A

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Ann Oaks [University of Guelph (retired), Guelph, ON]: Dr. Wambugu, I really appreciated your talk. I haven't seen such a good overview of the situation in Africa. You mentioned a population increase in Africa, whereas from what I've been reading, HIV/AIDS is causing a decline in numbers. My other comment has to do with nutrition. There are two ways to approach this, one being via agbiotech, the subject of this conference, for vitamin-A deficiency for example. But from my reading, NGOs like CARE and Oxfam are emphasizing small mixed garden plots to encourage families to grow a variety of foods. Sometimes we have a misperception in North America that one food is going to solve all the problems. We want a mixture. Carrots, for example, would supply vitamin A. Is that an alternative to Golden Rice™ and an easier alternative to handle?

You said something about subsistence agriculture and I have a feeling in North America we think that's bad. But really it's food for the people and it should be the first priority. In addition we need a cash crop and you stressed that. Bananas may be the cash crop; each country needs subsistence and cash crops. We don't want importation of food. We want to grow as much as possible. But each country—particularly in the South—have something to export: bananas or coffee or cocoa. I think that this is something that people in developed countries—America and Europe—do not appreciate and it needs to be addressed by the World Trade Organization, International Monetary Fund, *etc.* I wish Dr. Wambugu had brought her book along; I want to buy one. I want to buy ten. Thank you very much for a good talk.

Florence Wambugu: Thank you very much for that compliment. I share it with the rest of the people in Africa Harvest and many others working in Africa. The interesting bit about HIV is certainly there is population decrease, but at the same time it doesn't help because a lot of resources are being used on people who soon die. But, they don't just die in a day. Before they die, a lot of family income is consumed with medicine purchases, or whatever. Thus, poverty is increased by HIV. A large part of the problem is that the children are left. The high-risk population—many of them have several children who are left without anybody. Some people take them on board, so families are increased in size, which exacerbates hunger and poverty. Also those who live in poverty and are undernourished are more likely to succumb to HIV. They are less likely to respond even when retroviral drugs are available. I can't say that there is documented data, but it is very clear that good nutrition helps people who are taking anti-viral drugs.

I am in agreement that—whether it is banana, rice or whatever—there have to be products not only for eating but for generating some income to help the poor emerge from this vicious cycle. The North American countries now are big economies, but they started where we are. You started by farming and then by producing more, people moved to cities. Agriculture is the wheel that generates income that creates urbanization. Without producing surplus you don't have the wheel that drives industrialization.

Edilberto Redoña: Golden Rice™ has been mentioned. However, many rice farmers in Asia in particular, don't have the capacity or the access right now, or can't afford diversification. To cite an example in my country, most farmers plant rice and nothing else, so unless rice farming is profitable it is impossible to diversify. In Myanmar, for example, many people eat over 200 kilos of rice every year: breakfast, lunch, dinner and snacks in between. So while it's a good suggestion and needs to be explored you have also to consider the economies of these countries and access.

Manish Raizada (University of Guelph, Guelph, ON): A quick comment and then a question. To help some of our students and ourselves appreciate some of the realities in Africa or in Asia, I suggest listening to live-stream radio stations on the Internet. A radio station in Ghana called Joy-FM held a contest, and the prize was a sack of rice. When you hear that, it really hits home what the challenges are. I'm a molecular biologist and I would like my lab to assist in the training of future scientists in, lets say, Africa. but I'm also afraid of increasing the brain drain by doing that. Do you have any advice?

Wambugu: Well I don't think I have the answer, but I can offer some comments. It's a difficult issue because of the economies in Africa. It's good to come and take a degree here in Canada, but then the person may be trained with the mentality that the Canadian way is the only way to make things work back in Africa. So,

they go back home and they prepare a budget and are grieved to learn that it equals the budget for the whole organization. The people who are needed in Africa are those who will actually generate jobs, those who can use what they have learned here and are able to step it down and be innovative and take pride in their home situation and generate some kind of income or generate some kind of product. And so, sometimes you don't want to bring people to Canada or the United States. I don't have an answer to that.

Kanayo Nwanze (Africa Rice Center, Abidjan, Ivory Coast): There are many ways in which you can help students in Africa. There are programs for student training in biotechnology—affiliated with universities in Africa—and I can help you with that. Rockefeller offers training for young biotechnology scientists. We just had a case where two of those scientists returned to the Africa Rice Center as postdocs. But then you have to obtain funding for employment as postdocs. The budget is about \$40,000 a year, including benefits. I mentioned in my presentation a biosciences facility at the International Livestock Research Institute (ILRI). Is John McDermott here? Yes. that is another possibility for you to assist young African scientists—training at the facility in ILRI. And then we have exchange programs with which you can assist young already-qualified African scientists with on-the-job training in techniques and methodologies to enhance their research capacity. This could be summer training, or a specific training course, at the University of Guelph, for example.

Wambugu: I fully support that. Even in our own situation having the biotransformation laboratory in Kenya for GM sweet potato—has helped to bring back a number of people—although we still have some who haven't come back. Again I agree, but there has to be some infrastructure.

Joel Cohen (International Food Policy Research Institute, Washington, DC): A question for Dr. Redoña and a follow-up for Dr. Wambugu. Why has the Philippines been successful in approving and advancing GM food crops in Asia where China and India have not? Second question: I've heard that a well functioning biosafety system is now being looked at in parallel by a UNEP-GEF [United Nations Environment Program Global Environment Facility] effort under the Protocol; why are we examining another system when one is working fairly well? And Dr. Wambugu: the same question to you on food crops—why isn't it in all of Africa? Is South Africa is the only country that has approved food crops for use by its people?

Redoña: This is a very difficult question for me to answer given my perspective, which is pushing and pushing biotech products. The Philippines is considered to have among the strictest biosafety regulations in Asia and it has been successful probably because of strong support at the highest level. I'm referring to the level

of the president, enabling commercialization of certain crops. Otherwise it would not have been possible because of the strong NGO position. You say also that China has recently obtained support at the highest level, so I think the situation will change in China. I cannot say why we need to come up with another round of review—it was decided by the Department of Science and Technology. One thing that is good in the Philippines is that biosafety and the regulatory process is not under the wing of government that is generating all the outputs—the Department of Agriculture and the universities. It's done by a separate—like what was referred to earlier—arms-length regulation with NGOs in that case being regulators.

Wambugu: I think John McDermott has an answer to this question. I can only give indicators as to why only South Africa has commercialized GM crops. Let me start by saying that South Africa has 42% of all Africa's GDP. It's the richest country in Africa—42% of all the African wealth is in South Africa. And that's why almost all the companies we have are represented in South Africa because it has ability to purchase, there is money to pay for products. Like China, it has population with purchasing ability, so big companies are there. Now, all the products in South Africa are from the private sector so that doesn't make a difference with other countries, although local universities are also participating in terms of trials, *etc.* Also, before private-sector companies came on board, South Africa had its own scientific expertise in GM technology—people like Professor Jennifer Thompson—who demanded the protocol. It was internally driven. The GMO Act in South Africa was actually initiated by scientists in the country saying they needed such an act because they were already handling plasmids, they were handling DNA, they were handling GM issues. Because it was internally driven and the country already had capacity in biotech, things could be put in place very quickly. It was demand-driven. Then it was easy for companies to come on board with their products because the country had the infrastructure, and they had finances; it's a country that is developing very rapidly.

As far as other countries are concerned, it is necessary to develop regulatory capacity. Biosafety policy cannot develop in a vacuum. The legacy of so many biosector workshops is that they have not produced capacity. Workshops, conferences, do not develop capacity. They help in networking. But, a lot of people who came to Africa thought the way to fix biosafety was to have lectures. People moved from one lecture to another, but it didn't translate to a regulatory setup. The only countries that are making progress in this regard are those with GM expertise. Kenya's was driven by the GM sweet potato. Egypt has been partnering and networking with the North and has developed quickly; they are going to commercialize *Bt* cotton. Kenya will commercialize *Bt* cotton soon; the license has been issued for field-testing. I believe Zimbabwe has conducted some pre-commercialization trials. Nigeria has a protocol. Again, in a nutshell, policy cannot develop in a vacuum. There has to be local capacity on which to build and the country must have the ability to attract significant private investment.