

**The Robert S. McNamara Seminar:
Agriculture, Growth and Human Security
The Role of Agriculture and Agricultural
Research in Generating Growth and Post
Disaster Reconstruction**

(Transcript)

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Venue: Red Pearl Room, Capitol Tokyu Hotel

Secretariat: Good morning, ladies and gentlemen. Welcome to the Second Robert S. McNamara Seminar on agriculture, growth and human security. This seminar has been jointly organized by the Ministry of Foreign Affairs, the Ministry of Agriculture, Forestry and Fisheries and the Consultative Group on International Agricultural Research (CGIAR) with a great deal of support from the World Bank. I would just like to invite Mr. Yatsu, who will be our host for the morning, to come and make the formal opening for the seminar.

Yoshio Yatsu, Former Minister of Agriculture, Forestry and Fisheries, Member of House of Representatives: Good morning. We would now like to begin the Second Robert S. McNamara Seminar on agriculture, growth and human security. The purpose of the series of seminars is to deepen our understanding of how state of the art agricultural research in the world has contributed to the development and the reconstruction of the developing countries, and to engage in an exchange of views with agricultural and agricultural research professionals of Japan.

In October of last year, we held the first seminar on the theme of sustainable development and the role of agriculture and agricultural research. Today, we will be the second seminar of this series.

For this seminar we have requested Mr. Robert S. McNamara, former president of the World Bank and founding father of the CGIAR, to give a keynote address on the challenges of agriculture and growth, and the role of agricultural research. Thereafter, we have also requested former Prime Minister Hashimoto of Japan and the chairman of GLOBE Japan to talk about his life work, water issues, and the importance of agriculture and human security.

Currently, there are some 1.2 billion people in the world that are forced to live on US\$1 per day. Indeed, this is a ratio of one out of five people in the world. We can still recall very clearly that the millennium development objective to reduce this number by half by the year 2015 was agreed to by the international community during the Millennium General Assembly of the United Nations in the year 2000.

As you know, from a global perspective, the rate of growth in food production has been exceeding the rate of population growth in developing countries since 1970. However, from a regional perspective, in regions such as Africa, Latin America and parts of Asia, specifically, the rate of food production is lagging behind the rate of population growth.

If population growth continues at the current pace, by 2050, the world's population is expected to reach 9 billion, meaning that in 30 years or 40 years down the road, our food demand is expected to double. Nevertheless, the reality is that more than half the arable land has been degraded.

Beset with such a problem of a global scale, as a politician I have been working very actively focusing on the food issues and environmental problems. Finding solutions to the issues of eradication of hunger and reduction of poverty in developing countries, particularly in regions that are lagging behind in terms of food production, is the most significant challenge of the 21st century. I believe that agricultural research is the way to find solutions to these problems.

Over the years, the CGIAR has been promoting research, development and education in agriculture from a global point of view. For example, the research and popularization of the New Rice for Africa (NERICA rice) by the West Africa Rice Development Association (WARDA), which is one of the research centers under CGIAR, is a good case in point.

In closing, I would like to express my hope that this seminar provides a forum to deepen your understanding of the various challenges besetting agriculture and the role of agricultural research. Thank you very much for your attention.

First, I would like to call upon Mr. Ian Johnson, Chairman of CGIAR and Vice President of the World Bank, to deliver some welcome greetings.

Ian Johnson, Chairman of CGIAR, Vice-President of the World Bank: Thank you very much Mr. Yatsu. Let me welcome all of you to the Second Robert S. McNamara Seminar. I am delighted to be here, as always, in Tokyo and in Japan. I am especially pleased to welcome Prime Minister Hashimoto, Mr. Yatsu, Mr. Kitamura, Mr. Hinode, and of course, Mr. McNamara, who is here with us today. It is a great honor. It is a great honor that Mr. McNamara has taken so much of his time to join us because this seminar carries his name and carries it for a very good reason. Mr. McNamara was one of the founding fathers of the CGIAR and his commitment and passion for agriculture and agricultural research has never dimmed, and I am extremely grateful that he would come here.

It is also entirely appropriate that the Japanese government is hosting this event. Japan

is a world leader on some of the issues we are dealing with and has been a long-standing supporter of the CGIAR. Today, we will listen to a number of speakers, and they will all focus on the centrality of agriculture and its role in growth and human security.

The theme of human security itself has many dimensions. It has an economic security dimension, particularly in the way it can help create wealth in poor-income countries, and especially those, as we find in many parts of the developing world, where agriculture is between 25% and 70% of gross domestic product (GDP).

It can help also in its role in ensuring income security, because it is the poor that by and large live in rural areas, and it is the poor of the world who depend, in one way or another directly or indirectly, upon agriculture. Seventy percent of the poor live in the rural areas. The majority are employed, or sometimes underemployed, in the agricultural sector. Agriculture can not only be a driver of growth; it can be a driver of poverty reduction.

Third, it relates also to food and nutritional security. Today, and where we have 800 million people undernourished, but tomorrow, when the issue of food security will be a very real issue in the next 30 or 40 years or so. The hope that we have in the CGIAR for embedding within food new health traits, new vitamins, vitamins that are needed, essential vitamins and amino acids.

Fourth, its role in ecological security. Agriculture is at the heart of ecological security. Seventy percent of the water used today is used in agriculture—an issue I know Mr. Hashimoto, who has played a leading role in the Kyoto Water Conference, has often pointed to. Issues of land degradation, issues of forestry management are all very much tied up with the issue of agricultural development and the public policy choices we face in the next 20 or 30 years, in which direction we take such agriculture.

And linked with ecological security is the issue of the global environment, where it is quite clear from the projections of climate change that climate change could have and will have an adverse impact on agriculture unless we take remedial actions, unless we invest in the research and development that will mitigate that event.

Finally, it has a major role in political security, particularly in post-conflict situations. We have seen over and over again, from the Second World War to Afghanistan and probably into Iraq, that agriculture is a central pillar to getting economic growth and

prosperity moving in many countries. We will see it certainly in Afghanistan, and the CGIAR has played a role in post-conflict situations.

So all in all, I think we have an interesting seminar, and I am delighted to be here. I think one of the themes that I hope we will carry forward is the notion that agriculture is central. And if agriculture is central, the transformational power of science and technology applied to agriculture is going to be equally critical for today, tomorrow, and our future children. So I would like to welcome all of you to this important conference, and thank you for attending. I hope you will enjoy this morning's sessions. Thank you very much.

Moderator: Thank you very much. I would now like to call upon Senior Vice Minister Naoto Kitamura of the Ministry of Agriculture, Forestry and Fisheries.

Naoto Kitamura, Senior Vice Minister, Ministry of Agriculture, Forestry and Fisheries: Thank you very much for the kind introduction, I am Kitamura, Senior Vice Minister for Agriculture, Forestry and Fisheries of the Government of Japan. I would like to make some opening remarks on behalf of the Ministry of Agriculture, Forestry and Fisheries, upon the opening of the Second Robert McNamara Seminar this morning.

As one of the organizers, I would like to extend my heartfelt gratitude to Mr. Robert McNamara, who is the former president of the World Bank, who has traveled such a long distance and who will be serving as today's keynote speaker. He is of course one of the founding fathers of the Consultative Group for International Agricultural Research. I would also like to extend my appreciation to former Prime Minister Ryutaro Hashimoto of Japan, and my appreciation goes also to the very large turnout and the members of the audience today. I would also like to pay my highest tribute to the parties concerned at the CGIAR as well as the World Bank for your efforts in making ample preparations for this seminar.

At the United Nations General Assembly in September of the year 2002, the Millennium Development Goal was adopted. In the Millennium Development Goal, reduction of poverty and hunger has been established as the top priority agenda. Since a large part of the poor around the world is highly dependent on agriculture, the proportion of agriculture will not only directly contribute to the reduction of the starving population, but by bringing about income and employment opportunities will also play a major role in alleviating poverty.

So in that context, the agricultural research of a global scale conducted by the CGIAR plays an extremely important role as the foundation and the basis for supporting sustainable global agricultural production. For instance, the CGIAR has come up with many achievements, such as the development of varieties of high-yielding wheat and rice, which have brought about the so-called Green Revolution. Recently, NERICA rice and Quality Protein Maize (QPM) have been developed, and we have high expectations that there will be further contributions made to the global food problem in the future.

As far as Japan is concerned, we want to step up the implementation of the international joint research that we have been conducting through the Japan International Research Center for Agricultural Sciences (JIRCAS) and we want to continue on with the cooperation such as provision of financial contributions to the various research centers of the CGIAR. By stepping our partnership in the future, we want to contribute to the resolution of the global food security and environmental issues.

For agricultural and rural development, water is an indispensable resource. In March of this year, the Ministry of Agriculture, Forestry and Fisheries and the Food and Agriculture Organization (FAO) co-organized a ministerial conference on food, water, and agriculture as part of the Third World Water Forum. At this ministerial, it was indicated that water will play an important role for food security and for environmental conservation.

And the recommendation was adopted to overcome three challenges—that is to say, food security, poverty reduction and sustainable use of water—by stepping up partnership. So in response to this recommendation, the Ministry for Agricultural, Forestry and Fisheries (MAFF) has proposed the establishment of a network for international joint work. Recently, we have launched a domestic study group which will be in charge of networking the water-related research institutes. So we have embarked upon concrete action already.

In the future, we want to obtain participation by Asian countries as well as research institutes under the umbrella of the CGIAR so that we will be able to transmit Japan's experiences to them on water management centering on water politics. This is the second in the series of the Robert McNamara Seminars, but I think this is a valuable opportunity to deepen your understanding with regard to the role that international agricultural research has played so far and also its future direction of development.

I would like to conclude my remarks with sincere prayers that the world will be united in making the effort to further promote international agreement. Thank you very much for your kind attention.

Moderator: Thank you very much. Next, from the Ministry of Foreign Affairs I would like to call upon Mr. Eisuke Hinode, Parliamentary Secretary, for his remarks.

Eisuke Hinode, Parliamentary Secretary, Ministry of Foreign Affairs: Thank you very much for your introduction. My name is Hinode, Parliamentary Secretary of Foreign Affairs of the Government of Japan. I would like to say a few words on behalf of the Ministry. It is indeed a great pleasure to hold this seminar blessed with the presence of Mr. Robert McNamara, former president of the World Bank, and Mr. Hashimoto, former Prime Minister of Japan. I am very happy indeed.

First of all, on behalf of the Ministry of Foreign Affairs, I would like to express my sincere gratitude to the staff members of the CGIAR and the World Bank for your preparations in various areas as well as the speakers and the participants of this seminar for taking time out of your busy schedules and traveling to join us today. On behalf of the Ministry of Foreign Affairs, thank you very much indeed.

The first seminar was held at the United Nations University (UNU) located in Aoyama, Tokyo in October of last year. I am sure that many of the participants are attending today for the second time. The first seminar last year was held immediately after the World Summit on Sustainable Development (WSSD), and during that seminar the development and popularization of the NERICA rice in West Africa received much attention as a support measure to be provided by Japan. Currently, in order to further develop the NERICA variety, we have dispatched basic study missions of the Japan International Cooperation Agency (JICA) to several countries in West Africa from June 22 of this year. Today we are conducting research activities in Senegal as well. Furthermore, at the same time, to several Japanese embassies in Africa, we have given instructions to find specific deals that will lead to the development and popularization of the NERICA rice. On the part of the Ministry of Foreign Affairs, taking into consideration achievements through such activities, we are studying ways to present measures to contribute to the popularization of NERICA rice to the Third Tokyo International Conference on African Development (TICAD3) to be held in the fall of this year.

During the half-century history of Official Development Assistance (ODA) in Japan, agriculture has always played an important role. For example, from 1992 to 2001 agriculture accounted for about 10% of bilateral ODA. US\$14.6 billion were spent for agricultural development in the past decade, and in the past three years, Japan has accounted for approximately 40% of aid provided by Organisation for Economic Co-operation and Development (OECD) countries overall. More recently, there is unprecedented heightened interest in starvation issues in regions such as Africa. This is also manifested in the fact that during the Evian Summit held in June of this year, issues to promote the productivity of labor, such as the promotion of peace and security, and the enhancement of governance, received much attention.

Ever since the CGIAR was established in 1971, from a global perspective, research, development and education activities have been implemented in the area of agriculture. The results thereof have been enormously effective in alleviating problems of hunger and poverty in developing nations. Furthermore, I believe major contributions have been made in securing global food security.

These research activities of the CGIAR have contributed to the development of various regions of the world. The importance thereof is more important than ever going forward as environmental issues and food issues continue to receive significant attention. On the part of Japan, we fully recognize the importance of the activities of the CGIAR and will continue to provide as much support as we can.

In closing, I would like to express my hope that the discussions in today's seminar will contribute to the research and other activities of the participants bearing significant fruit in the future. Thank you very much for your attention.

Moderator: Thank you very much, Parliamentary Secretary Hinode. He has official business that he has to attend to so he will have to excuse himself. So please, we would like to thank Parliamentary Secretary Hinode for taking time out of his busy schedule. Thank you very much.

I would now like to call upon former President Robert McNamara of the World Bank to deliver his keynote speech. Former President McNamara requires no introduction in front of this audience but let me go through his personal history very briefly. He used to be the president of Ford Motor Company, and from 1961 to 1968 he served as the

Secretary of Defense in the Kennedy Administration. And from 1968 to 1981 he served as the president of the World Bank Group. The CGIAR's establishment was proposed by former President McNamara, and it was established in 1971. After returning from the post of the presidency of the World Bank, he has filled very important positions in various research institutions and non-profit organizations. Currently, he is lecturing and writing on the pollution, development, global hunger, environment and nuclear issues. So without further ado, I would like to invite President McNamara to take his place.

Robert S. McNamara, Former President of the World Bank, Founding Father of CGIAR: Mr. Minister, you exaggerate my accomplishments by far. But I want to begin, ladies and gentlemen, by saying that I am delighted to be back in Japan. I have learned so much from your country, your country's example and from the Japanese I have associated with all my life. I was born in San Francisco. I went to school with Japanese from the first grade through graduate school, and I have been working with your associates, as I say, all my life. I particularly learned from your prime minister, from whom we will hear later today. I am delighted to have the chance to be back with you.

Now in my brief remarks this morning, I want to make two points. The first is that the CGIAR research center directors, who are here this morning, and all the personnel who are associated with them in the centers and in Japan, have very much to be proud of. Japan has contributed immensely to the system not only in financial terms, which of course is important, but about 1,000 Japanese have been associated with the activities over the year. The cumulative return from the financial contribution of nations to the CGIAR has been extremely high, about 45% per year on investment. Very important. I do not know of any other center development expenditures over any extended period which can equal that cumulative return.

But to me, of greater importance is the contribution the CGIAR has made to reductions in poverty. God knows we human beings should be ashamed of the state of the world today: 800 million people are undernourished, are hungry. Many, many more are in ill health for lack of development. But the CGIAR, through increasing agricultural productivity, has made immense contributions not only to development in general, but particularly, to advance of the poor.

Now the second point I want to make is that the CG system and you in Japan face in the years ahead a very, very severe challenge. You are all familiar with the facts but let me emphasize the elements of that challenge. There will be about a 50%-increase in the

world's population in the next 50 years, between now and 2050, from, say, 6 billion to something on the order of 9 billion. And the food requirement will increase by approximately 100%. Now the 100%-increase in food requirement in relation to a 50%-increase in population recognizes the need to eliminate malnutrition today. As I say, about 800 million people go to bed hungry each night—some die from the lack of malnutrition—but all 800 million suffer from it.

In addition, the grain requirement will go up more than necessary to simply assure today's consumption of grain by those people, because as incomes rise, meat consumption will rise and grain requirements for meat consumption will rise. This rising requirement for food in the face of increased population, an increased consumption of grain per capita, will be in the face of, as you heard earlier today, falling soil fertility and increased pressure on the world's water system. I do not know any way to deal with that problem other than through increasing agricultural productivity, increasing the output of food per unit of scarce land and per unit of scarce water. That is the requirement. How to do that? By applying the technology knowledge we now have, which CG has so contributed to, and, in particular, by ensuring through agricultural research additional development of knowledge which can be applied in the future. There is no other way to deal with the problems that lie ahead.

Now, in the face of that, I am saddened to learn—I hope you are saddened to learn, if you do not know it already; and if you do know it, I hope you are saddened to reflect upon the fact—that Japan's contribution to the CG system, which the system has depended on during the past 31 years, has declined about 40% in the last three or four years. Now in a sense I know why. I would hope that your official development assistance, which has not gone down by anywhere near 40% in that period, would rise in the future. It is not going to; I know it, you know it. Your economic problems are such that you are not likely to make the political decisions, or the financial sacrifices that are necessary to ensure that your development assistance (ODA) rises. So I think we should be realists: ODA in Japan is not likely to rise. Now if it is not likely to rise how are we—you and me together—going to increase Japan's contribution to the Consultative Group system to offset that 40% reduction? It is not much that is required, about US\$22 million a year; that is a relatively small amount but it is not going to come about by increasing ODA by US\$22 million. I know that, you know it. So what to do?

The answer is: shift within ODA from bilateral aid to CG. You say, "Well, that is a dream. That is a plan in the sky." It is not a dream. That is the way to get maximum

contribution from your development assistance to increasing agriculture, to addressing the world's food problems in the next 50 years and, in particular, to reducing poverty. And the amount of reduction required in other elements of ODA of Japan is tiny: two tenths or 1%. So I am very, very hopeful that you will be willing to make that shift. I think you will be.

I want to repeat what I said before, I am deeply grateful to Japan. What you have contributed to my personal life I have told some of you and I will not repeat it now, how much I have learned from Japan as such. You are the most successful developing country I knew, I stole what I learned about why you have developed so successfully; it began back in the Meiji Restoration, it was repeated after the end of World War II. You put emphasis on smallholder agriculture and education (particularly primary education, particularly education for women). We should all follow that example. I have learned it from you. I am very grateful. Thank you.

Moderator: Thank you very much. Next, I would like to call upon Mr. Hashimoto, Former Prime Minister of Japan. As you know very well, Mr. Hashimoto is the Chairman of GLOBE Japan, which is showing a great amount of interest in global environmental issues. At the Water Forum that was held in the Kansai region of Kyoto, Shiga and Osaka, he was the Chairman of the Committee. He is particularly very active in the area of sustainable development and environment. Today, he will be talking about the role of agriculture as well as human security. Mr. Hashimoto, please.

Ryutaro Hashimoto, Former Prime Minister of Japan, Member of the House of Representatives, Chairman of GLOBE Japan: I am now highly regretting the fact that I accepted this offer to serve as the keynote speaker today. When I saw Mr. McNamara yesterday, I asked him why I was picked as the keynote speaker. He said that he asked everybody, but everybody was quick to escape. I, Hashimoto, was the only one who could not escape quickly enough and I think I was caught.

I think I should say this as quickly as possible but a lot of the criticism vis-à-vis Japanese ODA is very appropriate so that there should be a shift from bilateral aid to multilateral contribution, so we should devise ingenious ideas so that we are able to maintain the same budget. However, Americans are not paying their dues and contributions to the United Nations, so I do not want to hear it from you.

But Mr. McNamara, since the days of your presidency at the World Bank, was very

much aware of the importance of agriculture. We need to set up a major framework in order to set up agricultural research, and it was under your leadership that in 1971 the World Bank was able to establish the Consultative Group on International Agricultural Research. By way of establishment of the CGIAR, Mr. McNamara, you served as the catalyst for many agricultural initiatives including the Green Revolution. The fact that you are attending this seminar today is indeed proof of your commitment that you continue to be highly interested and supportive of agricultural research and development and the establishment of human security, including food security.

When we discuss water and when we discuss the sustainable development agenda, how Japan will be able to exercise her leadership as a member of the international community is the question that I have been involved in as a politician over many years. And naturally speaking, water and agriculture have a close inter-relationship which can not be separated from each other.

At the Johannesburg Summit, the WSSD, which was conducted of August of last year, we set up the Millennium Development Goal which should be achieved by the year 2050, so that we can halve the number of people who do not access to safe drinking water and basic sanitary facilities. It was at the Third World Water Forum of March this year which was held along the Biwa Lake, that we had the first occasion to review this agreement of Johannesburg. Of course we had the sidewind of the Iraqi War. However, the participants numbered 24,000. Ultimately speaking, we had 6,000 extra participants on top of the initially registered participants. We have not only identified what the issues at hand are, but we had very serious debate on various recommendations about concrete action. We should try to closely observe what the differences between the success stories and the cases of failures are, and we have to also clearly identify what kinds of solutions are necessary. And we considered how we would be able to turn them into future action.

So there were 337 breakout sessions conducted, and the results of such break out sessions were compiled into our commitment, the declaration statement for each major topic was input to the Ministerial Conference which was held at the end of the Water Forum. Therefore, recommendation was given that action should be based on the community. This recommendation of the Water Forum was very warmly received by the G8 Evian Summit thanks to leadership of President Chirac, and therefore, this became the current which led us from Johannesburg to Kyoto, and from Kyoto to Evian.

Water is indeed the source of humankind. There is no need for me to emphasize this point. Ancient civilization prospered alongside major rivers. Of course, water and rivers played very important roles in forming the foundation of humankind and civilization, but as is the case with other natural resources, water is not infinite. It is not that I am knowledgeable about countries other than Japan, but in the case of Japan, water used to be considered an affluent resource, an abundant resource. For instance, we have a Japanese saying that “all bad things should be flowed away with water,” and of course, to “be spending like hot water and water” is another saying. But under the current circumstances, we cannot continue on with such superfluous and frivolous usage of water so we have gathered together voice messenger opinions from around the world for the Water Forum and I was astonished by the diversity of the various issues related to water such as poverty, disaster, pollution, culture, traffic and climate change.

Just from the single angle of water, we could access all sorts of issues of interest to almost everyone around the world and much of those issues are actually problems which are confronted by the developing world. In the past from the 1950s to the 1960s, Japan experienced a series of failures and mistakes; many such problems have commonalities with such problems of failures. These are also a common agenda which is still faced by the industrialized world. We have me aware of this and therefore we have to learn from such mistakes and failures and we should share such lessons that we have learned, and the knowledge and the findings that we have learned from such failures. I think this is very important so that we do not repeat the same mistakes in countries around the world in the future.

In that context, agriculture and water are interrelated, needless to say. So water resource management such as hydro-generation, water and sewage systems, irrigation and waste water facilities, is extremely important in improving agricultural efficiency and food production in developing countries, and also to promote poverty reduction. Irrigated land around the world actually accounts for 17% of agricultural land, and 17% of the agricultural land that is with irrigation actually accounts for 40% of food production. In the upcoming 25 years, we have to increase this figure of 17% to 50%. If we are not able to achieve that, the entire world will be faced with a very serious food shortage. We must also double the level of productivity of currently irrigated land to be able to cater to the food demand that we expect to emerge. Therefore, efficient use of water is necessary for agriculture and increased food production.

I think many speakers have already alluded to the Green Revolution, and many have

already raised NERICA rice. Therefore, I do not intend to dwell at great lengths on the Green Revolution and NERICA rice in my presentation, but the question that I wish to pose to you is that when the battle began in Afghanistan, Japan took the initiative to host the Afghanistan Reconstruction and Assistance Conference here in Tokyo. However, I became aware of one shortcoming and I therefore flew directly to New York and Washington and also went to the World Bank, and saw Mr. Ian Johnson to request that we need assistance from the World Bank to overcome this shortcoming.

In the reconstruction plan of Afghanistan, agriculture is indispensable for the recovery of industry. However, the Taliban administration had totally destroyed the water system, the irrigation system for agriculture, and reconstructing that, was not one of the top priorities and therefore I flew quickly to New York to raise its order of priority. I also asked Mrs. Sadako Ogata to give us help that this be considered a top priority; so that the water routes which had been totally destroyed by the Taliban regime had to be reconstructed so that water can be properly managed in Afghanistan.

There is another problem related to this: the snow-water melting down the Himalayas. If Afghanistan uses up all of that water, Turkmenistan's and Uzbekistan's agriculture would be totally destroyed and therefore the Aral Sea would actually get the very last drops of the water which flow down from the Himalayan mountains. Once we make a mistake in the prioritization of the water management of Afghanistan, we would instantly destroy the water resource for the Aral Sea. I actually visited many international organizations but it was only the World Bank that really understood the nature of this issue. I was shocked and two days after I returned to Japan, I had the problem with my heart valve and had to be taken by ambulance to the hospital.

However, we tend to forget what is most important. That is water. In Iraq we also talk about water, but we are considering the provision of safe drinking water for the Iraqis. That is the sole question that we are considering in Iraq with regard to water. Is that really exhausting the issue of water? Are there not other water-related issues that we should be considering? The Asian farmers actually exercise their entrepreneurship.

A few years ago in Kenya, I had the opportunity to visit the Jomo Kenyatta University of Agriculture and Technology of Kenya. At that time, it so happened that the Urban Citizen Seminar was being held with women leaders of agriculture from all over Kenya. These women shared traditional knowledge of their villages. There was one woman who was conveying to another woman from a different region, an old traditional method

of her village of preventing evaporation of moisture by laying down straw on the furrows. Beset with the problem of great amounts of evaporation of agricultural water in large-scale upland farming in developed nation, I secretly wondered whether this method could also be applicable. The fact that female leaders were participating in the open forum is testimony to women empowerment and ownership. I was very much impressed, indeed.

This is because I belong to a generation that remembers Japan's development in the past as well. When Japan was defeated in the Second World War, I was in 2nd grade of primary school. Obviously, Tokyo's water system was completely devastated. There was no momentum to improve water supply systems in Japan but in the aftermath of the war, small scale water-supply systems were installed in the rural areas. This shortened the time required for children to pump water. Housewives had become the driving force for the so-called "Kitchen Revolution." Children had better opportunities to receive education.

The road to national economic growth originating from the development of the agricultural society has been proven in the rural areas in Japan in the past. This is something that we have already experienced. Our predecessors started to build schools over the piles of rubble and started to spread primary education for its people. Now when I came back to Tokyo, I found that my school was also devastated because of the bombing. When I was to graduate, however, I was able to have a roof on top of me in the school that I attended. As a secondary impact, the small-scale water supply system was improved throughout Japan and this has led to the promotion of public hygiene. Therefore, it seems that according to the experience that we have had in the past, we can convey the experience to many people in the world. That is my view.

The person who has written this draft for me has written a draft that is appropriate to be mentioned by the Minister for Foreign Affairs, but I do not think that this is my responsibility. Therefore, today, I would like to talk about human security, the establishment developed through agriculture. From that point, I believe there are many measures that we have to implement. One such measure is the following type of cooperation to be forged: this is the dream I have brought with me today.

From several years ago, in the area of environmental issues, I have not only been dealing with water, but I am also dealing with parasites. Now, it seems that research using global position system (GPS) to deal with parasites is becoming successful. There

are many types of parasites. For instance, I can tell you some of the names of parasites: the Japan blood-sucking parasite (direct English translation) which is passed on by certain shellfish carriers; malaria is another one. When the places of occurrences of such parasites are always in locations where there is constant flow of water which does not fulfill hygienic, sanitary conditions. First I myself questioned the feasibility of this program, but right now, based on the island of Mindanao in the Philippines, we are using the GPS program so that we can take countermeasures against the parasites. I think the probability of success is quite high.

So certain geological strata which fulfill the conditions for living of certain shellfish that are carriers and we take satellite photographs from up in the sky, we can take the GPS program, and for the wetlands where these types of shellfish reside, we will come up with certain configurations on the satellite photographs. By matching the satellite photographs, we are able to identify the source of infection.

In the context of agriculture, from the viewpoint of global environment, one headache is actually slash-and-burn type of agriculture. Not slash-and-burn, but in order to further proceed with development, we should have corridors where wild animals are able to move from one region to another region. Such corridors have become narrower and narrower. A few years ago, when I traveled to Africa, there were certain herds of wild animals that had moved over several countries—a kind of a green corridor that such wild animals were traveling across. And on the two sides of the corridor there was very active construction of buildings. The first time I went there, there were savannahs on both sides of the corridor, but now, we can see buildings being put up right adjacent to the corridor. Of course in that green corridor, there is also a supply of water. At the time of the rainy season, there would be an oasis of a very abundant water supply. But this being a plain, and of course discussing this with officials, we would not be able to see any progress with regard to securing of the Green Corridor. And the CGIAR can collaborate with other organizations. So satellite photographs with the GPS can be used to come up with advice for policy decision makers with regard to what the appropriate policies are to be taken in the specific regions.

I had this in my mind and I started to contemplate on the possible usage of the GPS system. It could be that some of the names are well-known. For instance, Tokugawa Yukio, who is one of the writers specialized in animals. If you look at his early works, he talks about how at the foot of Mount Fuji in Aokigahara Plain, there are certain animals residing in that area, and they are also passing through the Green Corridor.

Actually, they have exchanges with animals who are actually residing in the region called Amaki, which is far away from Mount Fuji. So if you pass by this region by car or by bullet train, *shinkansen*, the green corridor is severed in the middle. If the Amaki wild boar wants to come over to the Mount Fuji side, there is no corridor that it can pass, and for Japanese deer, if they want to go to the Amaki side, they would have to go across the expressway and perhaps collide with cars or get hit by cars.

Now in fact even in Japan these green corridors have been severed in very many areas, and if we are to reconstruct this, once again, it will require a tremendous amount of cost as well as energy. Taking this into consideration, the CGIAR, I believe, must look at agriculture from a wide vantage point and should also cover the wild animals as well as forestry issues. In Africa, the Green Corridor is being threatened. I hope that improvements can be made in this area as well. For that purpose, the GPS should be utilized. In fact, research has already been implemented for parasites. It is already bearing successful fruits. I hope that linkage can be established with the research activities in different areas. That is the dream that I have brought with me to this seminar today.

In that sense, through agricultural development, human security must be established and if we are to pursue this, what we have to do is enormous. In order to have peace and security established in the world, I believe that the civil society and private sector organizations, the government and various organizations should establish a partnership with the poor people. Already 58 of the developing and developed nations, private sector companies as well as regional and international organizations have been working together in terms of financial support, technical assistance and strategic direction. This is being pursued by the CGIAR. I hope that the CGIAR will continue to flourish and be successful going forward.

To you, Mr. McNamara, you still have 12 years before you reach 100. I hope that you have very long life and make us work very hard. Thank you very much for your participation today.

Moderator: Thank you very much, Mr. Hashimoto. We have received very interesting presentations, full of insight from Mr. McNamara and Mr. Hashimoto. In order to increase food production for a sustainable development, the role of agriculture and agricultural research is of utmost importance. From the point of view of human security, there are many areas in which agriculture can make a contribution. I think we have been

able to deepen our understanding on these points. In the panel discussion in the second half of this seminar, we will have reports from various organizations under the CGIAR so that we can have an active exchange of views with the audience as well. Thank you very much for your cooperation.

Secretariat: We would now like to have a photograph-taking session for Mr. Yatsu, Mr. McNamara, Mr. Hashimoto, Mr. Johnson, Mr. Reifschneider, and from the CGIAR the directors. People who have just been called are requested to come up to the stage. The audience is kindly requested to remain seated for further instructions. Thank you.

Mr. Hashimoto, the former Prime Minister of Japan, will now be leaving us. Please give him a big round of applause.

Francisco Reifschneider, Director, CGIAR: Ladies and gentlemen, good morning. It is always a very special pleasure for me to be here in Japan. Indeed, it is a privilege to be the moderator of this panel of the Second Robert McNamara Seminar on agriculture, growth and human security.

Let me introduce the first panelist of this session. Dr. Joachim Von Braun, Director General of the International Food Policy Research Institute (IFPRI). IFPRI enjoys a diverse and expanding partnership with many institutions and individuals across Japan. Most recently, IFPRI signed a memorandum of understanding with the Foundation for Advanced Studies on International Development (FASID), a Japanese non-profit research and educational institute. The Ministry of Foreign Affairs is indeed a leading partner in several major IFPRI research projects, including those on water resource allocation and the formation of human capital in South Africa.

Dr. Von Braun joined IFPRI in 2002, and was previously director of the Center for Development Research at the University of Bonn in Germany. Dr. Von Braun has worked in academia and in developing countries for many years, and is well known for his ground-breaking work on famine mitigation and prevention. Dr. Von Braun will speak on “Agriculture for Growth—Present State and Prospects for Sustained Crises Prevention.” Joachim, you have the floor.

Joachim Von Braun, Director General, IFPRI: Thank you for the introduction Francisco. Ladies and gentlemen, Mr. McNamara, dear colleagues and friends, it is a pleasure for me to be in Japan, to have the opportunity to address such a distinguished audience and,

hopefully, also to have an opportunity to discuss with you. We are here because of a set of problems related to human security and we are here because we have come to the conclusion that agricultural productivity is an essential part to the solution of these problems. Let me first highlight the problems briefly, selectively, and then address some of the solutions, again, selectively. As this is a panel, I will not be comprehensive.

Problem one: the world is not on track in cutting hunger at least in half by the year 2015. Problem two: in part of that, we recognize an increase in natural disasters reported over the last century. Even if we correct these statistics which have been better and better over time and have become more sophisticated over time, even if we correct them for that, there is no way to not conclude disasters are more prevalent. They are more costly and they mostly hit on poor people of the world. Problem three: the number of wars, conflicts and civil conflicts has increased over the last 50 years—not wars between countries, but within countries—and most of the casualties are within the civil population. Problem four: the growth of economy in developing countries is developing rather unequally, especially in Africa. The red line in this graph—per capita income growth—is faltering. If we look at the role of agriculture growth over the last two decades, I am unhappy to point out that agriculture growth in low income countries has declined—the growth rate has declined—although we have all the means in our hands, policies have changed and technologies have come along which should have produced a different outcome.

So we have these concerns. My conclusion of this talk will be that in the end, agriculture growth is not a cure-all, but very important to address all four of these concerns. We need a renewed focus on the quantity and quality of agriculture growth. Let me address seven issues in this talk.

First, there is the need to invest in human resources, improving the access to productive resources and improving market infrastructure and institutions. Those are ingredients to move agriculture growth forward in a pro-poor way. Agriculture growth and the linkages to rural development are not just in a correlate relationship; they are functional relationships and these are more complex, and our institutes in the CGIAR are working on that.

First, there is the engine of growth function of agriculture. In the early development process, Japan is an important example of that.

Secondly there is a multiplier in rural growth linkages, which sustain the long-term effects of agriculture growth into economy-wide growth effects. Agriculture research fuels these two effects: the engine of growth function of agriculture pulling ahead, and then the multiplier effects from these growth rates for the rural economy and the economy as a whole.

Agriculture growth drives overall growth. In poor countries where agriculture accounts for the bulk of employment, each new US dollar of farm income means up to US\$2.6 or US\$3 in total income as rural households demand more goods and services from other sectors. Those are these critical growth linkages. So we have to look at agriculture and rural development contexts.

So, agriculture growth for what? Not for its own sake, of course. It is to create jobs, income, to bring prices down, to facilitate long-term food security and health and nutrition. The quality of agriculture growth relates to two effects: one is the environmental effect which Prime Minister Hashimoto emphasized in his talk a moment ago, and the other is pro-poor growth effects facilitating human resource strengthening.

When we look back over the past 25 or 30 years, what were the key inputs which led to improved nutrition for children? The green field here in this pie chart is women's education. The blue one, more than a quarter, is food availability. The red one is improved health environment, and the yellow one is women's status. Agriculture growth impacts all of these, not only the food availability linkages, but also the other ones. Making farmers richer facilitates women's education, and so on.

So, agricultural growth for whom? For small holders. The world has about 450 million farms of all sorts of sizes. About 70% of them are smaller than 2 hectares and most of them are in Asia. People on these farms are among the poorest in their countries. Secondly, agricultural growth is for poor consumers, to bring food prices down and diet quality up.

Let me come to a second set of issues. Expanding research, knowledge and technology and improving natural resource management as key ingredients to get agriculture moving. I will focus mainly on research and knowledge. Renewed focus on the quantity and quality of agriculture growth is knowledge intensive. It requires public and private research investments.

Here we have a structural gap in the world. The tall columns on this graph are the public agricultural research expenditures per value of agricultural production in the developed countries such as Japan, Europe, OECD countries. They range in the order of 2.5% now. The small columns are the percentages of agricultural research expenditures in developing countries. Without overcoming this structural gap, growth will not be forthcoming to the desired extent in low-income countries. Much of the mission of this seminar, I understand, is to push up the columns on the left-hand side. The roles of the CGIAR are science for the poor, innovative capacity strengthening and communication with governments and civil society organizations in the private sector in order to come to policy improvements.

Let me finally come to the issues of supporting sound trade and macroeconomic policies, and promoting good governance and ending conflicts as the elements of the seven key priorities to move agriculture. I would be happy to address trade and macro-policies in the discussion period. Let me just emphasize point number seven. Before I do that, let me emphasize that the world is at a particularly critical juncture in WTO negotiations. More openness in trade in the OECD countries is indispensable in order to facilitate long-term growth in many developing countries, especially in the agricultural sectors.

Wealth, agriculture and conflict are in a very complex relationship. It is a research issue and we treat it like that. First, there is natural wealth—diamonds, oil, etc.—and conflict over that. We now know very well that rent seeking, capture, wars in brief institutional failures to govern the utilization of this wealth are root causes of many conflicts. Agriculture is also not free from conflict and the resources which drive agriculture are water, land, markets. However there is a lot less capture going on in agriculture, and the institutions governing an efficient agricultural sector, apparently in low-income countries, are more easily established than the institutions governing concentrated natural wealth. If we were to look at the patterns of wars and civil conflicts today in the world, they very much relate to the first issue. Investment in agriculture spreads capital much more thinly and makes capture much more difficult.

The third issue has been addressed in the previous session already: the massive need for rebuilding agriculture and food systems. The relationship between conflict and nutritional improvement is a very close one. The more conflicts, the higher child mortality and the worse nutrition. But it is a two-sided relationship: from hunger to conflict and from conflict to hunger. Conflict undermines agriculture and creates hunger, and hunger and low agricultural growth create conflicts.

Ladies and gentlemen, let me conclude with a statement of tremendous wisdom from a father of development corporation policy in Japan, Saburo Okita. Mr. Okita had been a member of the Board of Trustees of my institute in the 1980s, when I had the pleasure to meet him. Mr. Okita, as you know, was Minister of Foreign Affairs and was by training an engineer. So it is not without coincidence that he says, “Food is to man what fuel is to an engine. Without a sufficient quantity of proper good fuel, an engine will not perform well. Without sufficient food, people cannot work efficiently.” Malnutrition further increases individual susceptibility to various diseases, thus reducing the community’s overall work efficiency. Ladies and gentlemen, in the end it is people’s productivity we are after through raising agricultural productivity. That is why investing in research to do so is so critical. Thank you.

Mr. Reifschneider: Thank you very much, Joachim. It is my pleasure now to introduce the second speaker of this panel, Dr. David Kaimowitz, Director General of the Center for International Forestry Research (CIFOR). Japan’s exemplary commitment to sustainable foreign management in developing countries has led Japan to be one of CIFOR’s most committed partners. Since 1993, when CIFOR was established, Japan has been a strong partner, and it most recently played a lead role in the substantial rehabilitation of a degraded forest project. Dr. Kaimowitz, prior to becoming Director General of CIFOR, held senior positions at the InterAmerican Institute for Cooperation in Agriculture in Latin America. He is an accomplished author and has published several books and over a hundred scientific articles. David Kaimowitz’s presentation is entitled “Forests, People and Growth.” David, you have the floor.

David Kaimowitz, Director General, CIFOR: Good morning. It is a great honor to be here today in Japan and I would like to personally take this opportunity to thank our Japanese colleagues from the Ministry of Foreign Affairs and the Ministry of Agriculture, Forestry and Fisheries for organizing this important symposium to honor the work and life of Robert McNamara.

Coming from a forestry center, I was very happy to hear this morning Prime Minister Hashimoto mentioning forestry. Because the CGIAR just like the Ministry of Agriculture, Forestry and Fisheries has forestry as a major part of our activities. This morning I will be talking about the major challenges and opportunities facing Asia’s forests and what we can do to meet those challenges.

If we look at the region, Asia has almost 60% of the world's population but only 15% of its forests. While population has been growing by 1.4% each year here in Asia, the amount of natural forests has declined by almost 10% in the last ten years and many other forests have been severely degraded. That means that each year, there is a lot less forest available to meet the needs of every Asian family. Rapid economic growth in Asia is greatly increasing the demand for paper, construction materials, medicinal plants and charcoal. To meet those demands, a growing number of Asian countries have had to import their forest products. In 2001, Asian countries imported US\$34 billion in forest products and in the last few years, China has gone from being a relatively small importer of forest products to being the world's second largest forest product importer. China could very soon become the world's largest forest product importer.

For the moment, China can afford to pay for those imports. But for poorer countries such as Bangladesh, the Philippines, Sri Lanka and Vietnam, paying for forest product imports is rapidly becoming a major economic burden. The growing demand for food, timber and other products is putting pressure on the region's forests and unfortunately creating new incentives for illegal logging, which has become a major governance problem in the region. Destructive logging, the expansion of commercial agriculture and forest fires are depleting the forests on the islands of Southeast Asia, such as in Indonesia, where I live, and in the Mekong countries of Vietnam, Cambodia and Laos. Many rare plants and animals are being lost while burning forests are contributing a great deal to global climate change and all of its associated problems.

Loss of forest is particularly problematic and particularly important for the hundreds of millions of people here in Asia that still live in remote forested regions and depend heavily on forests for their food, for their energy, their medicine, their fodder for their cattle, fertilizer and cash incomes. Many studies have shown that the poorest people in countries such as China, India, Laos, Nepal and Vietnam are precisely the families living in the remote forested regions.

In the hungry season, when crops fail, where there is no doctor, many poor people in Asia rely on forests. That was particularly clear during the recent Asian economic crisis when World Bank and our studies have shown that many people turned to logging, hunting and gathering in forest areas to survive. While the good news is that poverty in the more favored agricultural regions have been declining rapidly in Asia in the last 20 years, the concerning news is that that has not happened in many of the forested regions.

The poor, remote, often abandoned and neglected forested regions of Asia have also become breeding grounds for violent conflict. If we think about the Mindanao in the Philippines, the current dramatic situation in Aceh in Indonesia, in West Papua, in parts of the Malocas, and Central Kalimantan in Indonesia, if we think about Northern Myanmar, the border area of Thailand, if we think about the forested regions in Nepal or northeast India, violent conflict unfortunately is closely associated with forest governance problems. This morning I woke up and I looked at my television, and there was talk about a South Pacific intervention in the case of the Solomon Islands. Unfortunately, too, the violence in the Solomon Islands is closely related to the forest governance problems in that country, where forest and timber exports are its major source of income.

Before you despair however, it is important, indeed fundamental, to say that there are also many exciting opportunities in Asia linked to forests and forestry. The regions' rapidly growing demand for paper, bamboo, fuel wood, sawing wood and medicinal plants presents a great opportunity for many small farmers. In most of the region, land is scarce and it costs a lot to transport forest products from far away. So planting trees is becoming increasingly profitable for farmers near towns and processing plants. Many Asian governments have also been devolving control over forests, to local communities and small farmers. That has benefited millions of poor rural households.

In China for example, the government has turned over degraded lands to almost 60 million households to plant trees. In India, over 35,000 village organizations are participating in the country's well-known Joint Forest Management program. Nepal and the Philippines have also made a lot of progress in this direction.

There is also increasing interest in Asia, and other parts of the world, in developing innovative mechanisms to pay forest managers, to conserve biodiversity, and to use trees as carbon sinks, and to protect rivers, streams, wells and reservoirs. We heard a lot this morning about water and I think it is important to remember that water plays a crucial role in maintaining the water quality of rural households and in regulating climate and hydrological flows. Because of Asia's high population density, it will be difficult to maintain large compact areas of forests as protected areas. But a lot can be done to encourage people to manage their land in ways that conserve biodiversity and provide these other vital environmental services, such as the water services and the climate services.

The region is also making a lot of progress in addressing common concerns, such as illegal logging, forest fires and forest degradation. One piece of good, positive news is that governments in the region have stopped blaming each other about these problems and have started working together to find positive, constructive solutions. That has opened up new opportunities for cooperation that many of us never even dreamed of. One particularly exciting initiative in that regard is the Asian Forest Partnership, sponsored by the governments of Japan and Indonesia, together with our center CIFOR and the Nature Conservancy, which was launched last year in Johannesburg at the World Summit on Sustainable Development and which is bringing together governments throughout this region to address the problems of illegal logging, forest fires and promoting forest rehabilitation.

Given the urgency of the problems and opportunities that forests present, we must move forward quickly to address the challenges. As we do, we must constantly try to understand why we succeed in some places and fail in others. Well-done research has to play a fundamental role in that process. Here in Asia, CIFOR is working closely with national and local governments, companies, national research institutions, NGOs and communities to promote that learning process, and we are doing it together with our Japanese partners, with Japanese universities, with the Japan International Cooperation Agency (JICA), with the Japan Forest Agency, and with the International Tropical Timber Organization based here in Yokohama.

Our research provides rigorous scientific information about all the complex and sometimes controversial topics I have been talking about, including everything from illegal logging and violent conflict to how to increase the incomes of small farmers by selling wood to companies that produce paper. We work at each level, from helping the Asian Development Bank design its new forest policy to assisting the governments of Nepal and the Philippines improve their community forestry policies, or helping the community, as at Tulong at the local level in East Kalimantan in Indonesia, find new ways to earn money by protecting its sources of water. Prime Minister Hashimoto will also be very happy to know that we are working on green corridors and that we have a young Japanese scientist who is starting this month, doing her PhD research in East Kalimantan on corridors for wild boars for local people in Indonesia.

The simple fact, ladies and gentlemen, is that forests are much more important for both peace and prosperity in this region than most people realize. Today, we have an opportunity to plant and protect the forests of the future, and to use those resources to

provide better lives for hundreds of millions of people. I have no doubt that together, CIFOR, the CGIAR, our Japanese partners and our developing country partners in the south can and will make that happen. Thank you very much for your attention.

Mr. Reifschneider: It is my pleasure now to introduce our third speaker, Dr. Adel El-Beltagy, Director General of the International Center for Agricultural Research in the Dry Areas (ICARDA). ICARDA's association with Japan dates back to the Center's establishment in 1977. When Dr. Jiro Orita, a JICA expert, first initiated research in sheep and goat diseases and helped develop effective control measures. Today Japan continues to be one of ICARDA's strongest supporters and partners. Many Japanese scientists from different institutions including JICA, the Japan International Research Center for Agricultural Sciences (JIRCAS) and the Tropical Agriculture Research Center (TARC) have made very significant contributions to the Center's work in several different areas. Professor Kobori of United Nations University continues a strong tradition of Japanese leadership at ICARDA and is currently Vice Chair of ICARDA's Board of Trustees.

Dr. El-Beltagy has a long and distinguished career in academia and public service, always with a focus on dry land farming. He has been Director General of ICARDA since 1995 and is currently the Chairman of the Center's Director Committee of the CGIAR, which brings together the Directors General of each of the 16 centers of the CGIAR. Dr. El-Beltagy will speak on "Agriculture in Post Disaster Situation: The Central and West Asia Experiences." Adel, please.

Adel El-Beltagy, Director General, ICARDA: Thanks, Francisco. Ladies and gentlemen, honorable guests, it is my privilege and honor to be here with you in this remarkable meeting for the Robert McNamara workshop, a man with great wisdom and vision who has led different institutions in a visionary manner; he is truly a founding father of the CGIAR. He has his footprints in several avenues of development worldwide. It is my pleasure as well to be here with you in Japan, a country with great cultural heritage and wisdom, so has it been perceived as such in the countries in the south.

When the CGIAR founding fathers designed its mission, they saw the international agricultural research centers playing an important role in improving the welfare of the poor population in peaceful situations. But over time, the centers have been challenged to respond to the need of rebuilding agriculture in countries affected by war, conflict and natural disasters. This important dimension of the CG system work has remained

much less known, and I will present to you ICARDA's experience in the context in the Central and West Asia region.

ICARDA is one of the 16 international research centers supported by the CGIAR. Several of these centers, like ICARDA, are involved in rebuilding agriculture in post-disaster situations. ICARDA has both global and regional mandate. It has a global responsibility for the improvement of barley, lentils and fava beans, and for the sustainable management of natural resources in the dry area, especially on on-farm water use efficiency. ICARDA has a regional responsibility to Central West Asia and North Africa Region (which is called the CWANA region) to research and improve durum and bread wheat, chickpea and forage and pasture crops. Our regional mandate also places emphasis on rangeland improvement, small ruminants management and nutrition. ICARDA's strengths lie in its research expertise drawn from all over the world. The current senior researchers at ICARDA represent over 40 nationalities.

I am truly happy that this seminar is in Japan. As I said before, Japan has been one of the important donors to the CGIAR and ICARDA. In addition to financial support, it also provides in-kind contribution to ICARDA, such as sophisticated laboratory equipments and many scientists from Japan, the International Cooperation Agency, JICA and from JIRCAS, who have come to work at ICARDA and have made significant contribution to the Center's work.

Recently, ICARDA named its livestock, nutrition and health laboratory after the veteran Japanese scientist Dr. Jiro Orita, to recognize his outstanding contribution to ICARDA's research program. The laboratory was opened by His Excellency Tomio Yoshida, the Japanese Ambassador in Syria.

A recent study by the International Peace Research Institute in Oslo has examined 103 conflicts that took place between the end of the Cold War in 1989 and until 1997. In addition, the UNDP data indicates that 90% of the casualties in the recent conflict have been civilians, mainly women and children, as mentioned by my colleague, Dr. Joachim Von Braun. As you see in this map, most armed conflict, whether domestic or international, has been concentrated in regions heavily dependent on agriculture: South and West Asia, the Middle East, Central Africa and part of Latin America. Other than taking human lives, war destroys food and water supply sources. In addition to the direct and indirect disruptive effect on agriculture, longer term environmental effects: many may linger from land-mining, deliberate flooding and degradation of soil from

chemical warfare. Biodiversity and seed systems are damaged or destroyed. Shortages of seed after war can cause widespread starvation. In the ICARDA region, conflict has taken place or continues to take place in Afghanistan, Palestine, Lebanon, Libya, Algeria, Kuwait, Jordan, Iran, Iraq, Sudan, Ethiopia, Eritrea, Cyprus, Yemen, Georgia, Abidjan, Armenia and Tajikistan. Capitalizing on ICARDA's focus on enhancing sustainable agricultural development, natural resources management and its apolitical status and internationality, the Center has continued to work under difficult conditions of economical sanctions and civil war in different countries in the world, in particularly recently in Afghanistan and Palestine and Iraq.

The ICARDA approach: it is a massive task to rebuild agriculture in countries affected by conflict and/or natural disasters. Our rehabilitation strategy is built around three key elements: partnership, networking and program developments for the medium and longer term. The ICARDA approach to partnership is to provide or build a platform and create an enabling environment for a variety of actors to play the role. Agriculture is not just growing crops; it encompasses all sorts of other aspects like environment, transport, marketing, agro-industry, infrastructure, human resources development, farmer cooperatives, policy and property rights, and other aspects. In recent years, ICARDA has been confronted with the task of rebuilding agriculture in Afghanistan. The Center is, as well, preparing for the interventions in Iraq as well as in Palestine.

The challenges in Afghanistan are immense and complex. The country has suffered 20 years of violent conflict and 4 successive years of drought. The result has been a widespread displacement of people and a large number of widows and disabled. Much of the infrastructure is damaged and the market has been disturbed. A partnership called the Future Harvest Consortium to Rebuild Agriculture in Afghanistan has been established. ICARDA is coordinating this effort. The Consortium consists of nine centers of the CGIAR and other partners and donors such as US Aid, Defid in the UK, IDRC from Canada and other international organizations such as FEL and UNDP. Up to now, US Aid and IDRC and OPIC have been the major donors in this effort.

Following the recommendation of the Tokyo Declaration to Rebuild Afghanistan, the *tashikan* meeting, which is being designed to get all the members of the Consortium, has developed a framework for both short term and medium term to rehabilitate agriculture in Afghanistan. This has four major components: a seed system and crop improvement, soil and water management, livestock feed and rangeland, and horticulture plus marketing. Following the *tashikan* meeting, needs assessment studies

were carried out by multi-partner teams in all four areas in Afghanistan in 2002. The Afghan Minister of Agriculture and Livestock visited ICARDA, he expressed a need for training and requested help in setting up seed cleaning and seed testing laboratories, and in the training of local researchers. The formal agreement between ICARDA and the government of Afghanistan was signed. The government of Afghanistan, led by President Hamid Karzai is fully supportive of the Consortium strategy and activities, and he emphasized the importance of agriculture in developing his country.

The lack of seed in Afghanistan was seen as a most serious, immediate problem facing Afghan farming communities. In 2002, over 3,500 metric ton of high-quality wheat seed was provided to Afghanistan for spring planting, and over 5,000 ton for winter planting. More than 70,000 farmers benefited from these seed supplies. It is also permitting the start of seed production locally, which is very important and vital for the process of rebuilding agriculture in Afghanistan. A workshop was conducted in May 2002 in Kabul to formulate a code of conduct governing seed-related activities, as well as with the development of Seed Lo., which will be very important and was adopted by the government for future work.

ICARDA, with support from US Aid, has started rehabilitating agricultural research stations in Kabul, Baghlan, Konduz, Takhalm and Galalabad, where germ plasma evaluation has started, and seed pathology and testing laboratories have been established as well. Over a hundred participants have been trained in seed production and quality control, water management, integrated pest management and crop improvement. We just finished a series of training courses supported by JICA, in which 25 Afghan researchers participated. Here you see a JICA resident representative in Syria at the closing ceremony of the course. He awarded the certificates to the Afghani participants. Therefore, the rebuilding of agriculture in post-disaster situations is benefiting from ICARDA cooperation with Japan in human resource development. In just about a year, the Consortium has contributed to an increased availability of food and household income, and hence may contribute to the restoration of social stability.

ICARDA has drawn a plan to be ready to participate in rebuilding agriculture in Iraq. Agriculture in Iraq has suffered because of war and drought, economic sanctions, and other internal and external factors. The country is in need of substantial humanitarian rehabilitation and reconstruction assistance, to regain food security and infrastructure development. ICARDA holds in its gene bank 1,000 accession of various food and feed crops collected from Iraq. It has also maintained safety duplicates, a copy of the Iraqi

national gene bank collection crucial to rehabilitating agriculture in Iraq. We know now that the gene bank on Afghanistan has been destroyed, as well as the gene bank of Iraq is being destroyed. All these genetic resources, which are held at the gene bank in ICARDA and the other CG system centers, could be returned back to both Iraq and Afghanistan to help them in future agriculture activities.

Over 17 new varieties of cereal, food, legumes, crops were released in the past in Iraq through collaborative research with ICARDA. An integrated project on crop/livestock production, as well as other activities related to on-farm water use efficiency, has been going on in the last 25 years. The Center has also trained over 345 Iraqi researchers. ICARDA will adopt a consortium approach as well to assist Iraq. The consortium will consist of other sister centers of the CGIAR and it will focus on immediately multiplying and delivering quality seed of adaptive varieties, and in the longer term provide technical assistance in the development of sustainable agriculture, and development of a strategy that will ensure a close integration of relief, rehabilitation and development.

Within the framework of the multilateral working group on peace and the environment sponsored by Japan, ICARDA is facilitating the regional initiative for dry land management. The project is focused on environmental protection, particularly combating desertification and optimizing marginal quality-water use, range management and human resources development. The ongoing conflict in Palestine is damaging agriculture, biodiversity and infrastructure, and causing water scarcity and breakdown of marketing systems for local products. In spite of ongoing conflict, ICARDA has continued to work in Palestine. In spite of the serious security problems and the constraints faced by the national program, ICARDA has been operating just a few in the peace-supported project to preserve agro-biodiversity in Palestine. The work plans are being implemented in collaboration with development projects, national institutions such as the Applied Research Institute of Jerusalem and Nagagh University, the Betelkhad Agricultural Station in Ginene, and others.

Water-harvesting techniques to enhance agro-biodiversity in Palestine project sites are being implemented, as seen here, which is a site that is being established for both field crops as well as for horticultural plans. With each collection of genetic resources from Palestine in its gene bank, ICARDA recently repatriated one thousand accessions of different wild species which were collected from there. It will be returned to Palestine. Then it can be used in the breeding program in the future. It consists of field crops as

well as forage crops and other collections. The Center has made some very useful selections from Palestinian genetic resources. For example, a forage named Visia Palestina, which originated in Palestine, has been subjected to selection to identify lines of high biomass and is suitable for cultivation to feed livestock, as you see here in the slide.

Training young researchers is a key area to provide the Palestinians with opportunities for higher studies. Recently, 14 teachers from the Aldahar area and from a Sierre part has the training course to increase awareness about the importance of conserving local agro-biodiversity. These courses are very important for the Palestinians, therefore they will have dignity and they will have the ability to communicate with the other neighboring countries and therefore they can enhance even the peace process. We hope peace will soon return to Palestine so we can, using a consortium approach, speedily contribute to improving the livelihood of the people of the country by rehabilitating the agriculture and preserving the environment.

We have involvement in Central Asia, which is countries in transition, but this involvement as well is in the context of intervention which will make a difference. ICARDA is coordinating the efforts of ten centers of the CGIAR in this region and there has been an impact, which is increasing productivity of different crops, as well as enhancing the establishment of gene banks, which could maintain and could preserve the future imports of this country's agriculture.

I would like just to mention—I will move fast here—that training and human capacity in conflict areas are very important because, without this training which can be provided to the national scientists as well as the researchers as well as extension workers, with the involvement of the civil society, you cannot make a difference. Then, human capacity or capacity building, not only in the physical infrastructure, but with human infrastructure, is very important.

Ladies and gentlemen, in today's world, the scientific community more than ever before has a great responsibility to work in a unified way so that physical, biological, behavioral and social science can address these profound and pervasive problems. The scientific community can generate new knowledge and apply it to understand the nature and sources of human conflict, and develop effective ways of resolving them without violence. Our challenge today is to use science and technology for peace throughout the world. I would like to end by saying to you that the support of Japan is being perceived

very positively, even within the context of the support of the OECD countries. You have a special position and this special status of Japan is a global perception of the countries in the south. Therefore, I would hope that the continuation of the support of Japan to make a difference, to bridge the gap between the haves and have-nots, to bridge the gap between the south and the north, is highly appreciated. Thank you very much. Thank you.

Mr. Reifschneider: I would like to introduce our panel commentator, Dr. Keijiro Otsuka, Director of the graduate program of the Foundation for Advanced Studies on International Development (FASID). Dr. Otsuka was previously professor of economics at the Tokyo Metropolitan University, a visiting scientist at one of the CGIAR centers the International Rice Research Institute (IRRI), and a visiting research fellow at IFPRI. He has been a member of the Board of Trustees at IRRI since January 2002 and will occupy its most senior position as Chairman of the Board of Trustees at IRRI from January 2004. I would like to invite Dr. Otsuka to comment on the panelists' presentations. Dr. Otsuka, you have the floor.

Keijiro Otsuka, Director, Graduate Program, Foundation for Advanced Studies on International Development (FASID): Thank you very much, Mr. Chairman. Ladies and gentlemen and distinguished guests, it is a great pleasure for me to be able to comment on the three excellent presentations by three most prominent director generals of the CG centers. Their presentations were so excellent that I do not have much comment. So aside from my brief comments, I would like to propose specific development strategies based on our own research.

I fully agree with the presentation from Dr. Von Braun. In particular, I agree with the following points. First, enhancing agricultural productivity is highly relevant for billions of poor people. Second, new pro-poor and environmentally friendly or sustainable technologies are badly needed for poor areas. Thirdly, therefore, we need to invest more in agricultural research to generate new appropriate technologies for the poor.

I also fully agree with the presentation by Dr. Kaimowitz. In particular, I agree that farmers need technical support and appropriate daunting systems for more efficient and sustainable use in the effective preservation of forest resources. I just want to add one remark. That is, in order to promote sustainable use of forest resources, enhancing productivity of the existing farmland is of critical importance, as farm-size expansion is a major of deforestation. If more food can be produced from the existing farmlands,

there would be less pressure on marginal lands, including forestlands.

I appreciate and am very proud of ICARDA's activities in most difficult areas, and I totally agree that reconstruction of the agricultural sector is certainly the key to the rapid recovery of disaster-affected areas. I am not familiar with those difficulty areas, but nonetheless I would like to argue that such activities are most effective if the stock of useful technologies is developed elsewhere and which can be transferred to the difficult areas. I would like to refer to the experience of IRRI in Cambodia later on.

So specifically, what should we do? Specifically, what should CG centers do? I want to emphasize the importance of Green Revolution. Green Revolution is an excellent example of pro-poor technology because increased ease makes it possible to provide cheap foods for the poor people. Green Revolution technology is environmentally friendly because larger production from the existing fields lessens the pressure on forests and other marginal land resources. It is very important to remember that Green Revolution technology was introduced by scientific research in international research centers, such as IRRI and the International Maize and Wheat Improvement Center (CIMMYT). Development of heightening varieties triggered the subsequent development of National Agricultural Research Systems (NARS), investment in irrigation and development of markets, including credit markets, fertilizer and other markets.

So an important question is if Green Revolution is possible in poor areas. I believe that the opportunity is now ripe for Green Revolution to take place in many poor areas, including Cambodia and Sub-Saharan Africa. My answer to my own question is "yes" if sufficient investment in agricultural research is made in crop-breeding research or germ plasma improvement, integrated with other research efforts such as conservation of soil and farming system research.

This graph shows changes in rice seeds over the last several decades. Several important observations can be made. First, rice yield started to increase dramatically around 1970 in Southeast Asia, including Indonesia, owing to the development of hiring varieties biyearly. However, yield growth practically ended at the end of the 1980s. Secondly, Green Revolution took place a little bit later in South Asia, including India. There is a time lag because it required a lot of extensive adaptive research efforts to transfer the technology developed in Southeast Asia to South Asia. Thirdly, you may notice sharp increase in yield in Cambodia in the 1990s. This was made possible particularly by the

contribution of IRRI, which was supported by the Australian government. But it is obvious that rice yield in Cambodia is still very low. I think that is because of the inadequate investment in research and other infrastructures. Fourthly, and most importantly, we can see that rice yield has been stagnant in Africa. But this is not surprising at all because there has been little investment in rice research in Africa, particularly research on lowland rice. This implies that Green Revolution is not possible in Sub-Saharan Africa. I definitely do not think so.

This photo is the photo of IRRI varieties, IR54, grown in Tanzania. Actually, this is the irrigation project site of JICA. According to JICA, yield per hectare, here, is five tons, which is comparable to the yield in irrigated fields in Southeast Asia. Of course, this is not atypical rice-growing area in Africa, but I also found the same yields in other irrigated areas in Africa. So I believe that this photo illustrates the potential of yield growth in Sub-Saharan Africa.

This graph shows changes in maize yields. In Thailand and Mexico, roughly speaking, maize yields doubled, owing importantly to the development and diffusion of high-yielding maize varieties made possible by CIMMYT. Again, maize yield has been stagnant in Sub-Saharan Africa, but this is not surprising at all. There has been little investment in maize research in Africa. Again, the question arises as to whether maize Green Revolution is possible in Africa. My answer again is “yes.”

This is a photo of a dairy cow, which is a crossbreed between European cows and local cows. Dairy cows are becoming very popular in the East African highlands now. Dairy cows produce not only a lot of milk, but also a lot of manure. I observed in Kenya enough application of manure doubles maize yield from 1.5 tons per hectare to 3 tons per hectare, or from 2 tons per hectare to 4 tons per hectare. The use of manure contributes to the rehabilitation of much degraded soil in Sub-Saharan Africa. Also the use of manure is environmentally friendly because manure is substituted for chemical fertilizer. If manure application is combined with serious research efforts, I believe that a new Green Revolution is possible in Africa.

I fully recognize the importance of America. America is important. But I would like to emphasize that there are many promising areas of productivity-enhancing agricultural research in a number of areas. East and Southern African countries have been particularly neglected. In my observation, they possess high growth potential. Therefore, I strongly recommend investing a new strong agricultural research center in poor areas,

particularly East or Southern Africa. According to my rough calculation, with investments of US\$10-20 million, there can be revolutionary changes in farming systems in Africa towards greater security and thus towards greater human welfare. Thank you very much for your attention.

Mr. Reifschneider: Ladies and Gentlemen, I would like to invite you to ask questions and make comments, in relation to the presentations that we have heard from the four panelists, and perhaps what we will do is entertain a few questions and then return to the panel members for their comments. I see that we have a microphone to my left, to your right, I wonder if we have a portable microphone as well to facilitate? We do? Okay, so questions and comments. Yes, Mr. Ishihara, please. There is a portable microphone here, Mr. Ishihara.

Mr. Ishihara, Secretary General of Dukasamath: Thank you very much for giving me this opportunity to take the floor. I am Ishihara, Secretary General of Dukasamath. Thank you very much indeed for the wonderful presentations. I would also like to extend my appreciation for the various comments for us representing my role as someone involved in international agriculture research. I am sure that I agree with many of the points which have been raised. Of course, the global population is to go up to nine billion by 2050, and therefore food supply and water supply will very much come into shortage, and since there is a high proportion of poverty in rural areas, agriculture and rural development will become of foremost importance. In order to resolve the various problems in regard to this, of course agricultural technology development will become increasingly important.

In December of last year, we were able to end the elucidation of the vice general sequence, and therefore we want to come up with rice and other products which will have durability vis-à-vis dryness of weather, and setting apart the rice genome sequence elucidation as well as the Japanese agricultural role research is concerned, we want to also enter into water research so that we will be able to resolve the various problems at hand with regard to agriculture and foods. In resolving such an agenda, we would like to rely upon our cooperation with CGIAR, the 16 research centers spread around the world, and we tend to attach a very high level of importance to the work that is being conducted by the CGIAR, so we want to reinforce the partnership with the CGIAR, so that together we will be able to make a contribution towards the resolution of the problem of global starvation. Therefore, I would like to express my appreciation for your contribution today, and thank you very much indeed for giving me the floor.

Mr. Reifschneider: Thank you very much. Yes, please.

Mr. Kazu Watanabe, University of Utsukoba: Thank you very much. Kazu Watanabe, University of Utsukoba. I would like to ask for two comments from all the panelists. Number one is that all of you mentioned agriculture, forestry and the food system recovery associated with the conflicts. Actually, the recovery of agriculture itself is not only on agriculture, per say. It is also associated with promoting self-employment and also facilitating disarmament under the development of community, again, avoiding putting back into conflicts. So I would like to ask for comments on that matter.

Also, my second request: you mentioned problem-solving or alleviation on agriculture in developing countries. But, actually, problems in the developing country could be a problem in our community. Actually, food chains are international, so once problems happen in one particular region, it also affects the food supply to other regions. So I would like to ask for comments. Thank you.

Mr. Reifschneider: Thank you very much. Yes, please.

Unidentified speaker: I also have questions about the conflicts. Some of the conflicts are created by the lack of clear property rights, when people are not sure of who has the right to use the water and who has the right to cut the trees, there will be conflict. But ultimately, the countries have the responsibility to provide property rights and protection of property rights. So where is the role of the CG system for the Japanese government or other donor countries to support the creation of clear property rights and protection of property rights? That is my question.

Mr. Reifschneider: Thank you. Yes, last question here. Yes, please.

Unidentified speaker: I agree that the objective of the agricultural sector is to improve productivity and the three centers were emphasizing on improving the varieties. The problem there is, again, it would improve varieties responsive to more fertilizer, which might lead to more regulation and other things. Another important thing is we could go through the agro-ecology approach, which some of the senators might have been trying to do, which Professor Otsuka was trying to bring in through the cattle approach, which may reduce the regulation of the land. Another important category which Professor Otsuka was emphasizing is what we find out in most of the empirical research is

agricultural productivity can be easily increased by 20-30% in the Asian countries if the best practice techniques are approved. So in most of the things the research and development, how to improve the best practice technique should be given much emphasis in the approaches, something which occurred in the earlier 1960s, but has been slowing down in this latest period, which Professor Otsuka emphasized and I would like to say.

I have one question, what about the position of genetically modified agriculture (GMA)? None of you mentioned that, so is there any future for that—and also for the hybrid varieties? Thank you so much.

Mr. Reifschneider: Thank you very much. Let me invite the speakers for their brief interventions and I would like to begin with Dr. El-Beltagy, please.

Mr. El-Beltagy: I would like just to make a comment in relation to the issue of water, food and conflict. When we look at areas in the world, we have maps of the world with three colors—blue, red or light pink. The areas which have maximum water poverty in the world are North Africa, Central Asia and West Asia, and of course there are other spots around the world, but this is the maximum. Then, if you look at conflict and water wars, it is a reality. Therefore, we need to have an intervention on two levels. One level is to optimize the use of available water. The other one is to change the genetical makeup of the plants to be more efficient in producing higher quality food as well as high yield, with less water. Therefore, there are two dimensions where we can have this approach.

The other question which relates to property rights: yes, intellectual property rights is being handled by several centers. Last week, at one of the centers in ICARDA, we had a specific workshop on intellectual property rights, where all the national system representatives were there. It is very important, especially in relation to land as well as to innovations, as well as to water aspects. Therefore, I would agree with this point. I will stop here, thank you.

Mr. Reifschneider: Thank you very much, Adel. Let me invite Dr. Kaimowitz for his brief intervention.

Mr. Kaimowitz: I think it is a very good question—what can be the role of a center like our center at least—a forestry center—and the question of conflict. We see in particular

four roles that we think are appropriate. The first is to increase people's awareness of the government's problems in forested regions and the potential that that has for creating conflict. People often ask the question why we should invest in forested regions if the internal rate of return in those areas is not very high and in some forested regions, and not others, the population densities are very low. I always like to use the example of Mexico, where the outbreak of conflict in Chiapas in 1994 in an area that has fewer than 200,000 people caused a financial crisis to the government and a political crisis. Had there been more investment in property rights, in social services, in bringing those people in that forested area of Mexico into Mexican society, they could have avoided that financial crisis and that political crisis.

So the first role is a role of making people aware of the needs of forested regions which have long been neglected. The second is that in a surprising number of cases of conflict around the world, environmental and forestry issues are on the negotiating agenda. We have seen this in Columbia, we have seen this in Nicaragua, we have seen this in Nepal, we have seen it in a number of countries. CG centers can provide impartial, informal, acceptable input into that process. If we go to the post-conflict area, we see that one of the big losers around the world in post conflict is the environment. If you look at each post-conflict situation, often the easiest thing to do with demobilized troops is to resettle them into forested areas and often a lot of people who are running around with automatic weapons find that their only source of employment is illegal logging. We think we can play a helpful role with governance in post-conflict planning in countries like the Democratic Republic of Congo and Nepal.

Finally let me say that many of these conflicts we are talking about are low-intensity conflicts. They become violent at times and then they become less violent at other times. If we think of a place like Nagaland or Northern Myanmar, these are not conflicts that are killing thousands of people every year; they are killing a couple hundred people. It stops, it starts again. These are areas that need assistance in improving the basic institutional structures of governance and I believe the CG system can help. Thank you.

Mr. Reifschneider: Thank you, David. Before inviting Dr. Otsuka for his comments, I would like to invite Mr. McNamara.

Mr. McNamara: First, I want to apologize for having to leave. I went to meet with the Finance Minister. I think he is a rather important individual in determining whether Japan's contribution to the CG will rise by the US\$22 million per year that I think is

required for your purposes, but I apologize for leaving.

Now, the question that was asked a moment ago is a very fundamental question. Why do we need more money for CG? Why do we need more money for research when existing technology is not being used? I think the estimate was output of food can increase 30% with existing technology, without new technology.

Why spend money, waste money, if you will? The implication is waste money on new agricultural research. The answer is, number one, the questioner is absolutely right. The existing political leadership in many developing countries is ineffective and it could increase agriculture output today, without anymore research. That is particularly true of Sub-Saharan Africa. Now why is the political leadership ineffective? In part, because of massive corruption, and I hope those of you who may be from Africa are not insulted by that. The Africans I talked to are not insulted by that. They know it, they admit it and they are determined to correct it, and some progress is being made and it must increase.

I told a current Sub-Saharan African leader that most of the people around him, his political associates, are incompetent or corrupt and something had to be done to change that; and the responsibility was his, the responsibility of the elite, the political elite, the commercial elite, the academic elite, the media elite, in that country and broadly speaking across Sub-Saharan Africa. That is going to come. That will take us ahead, let us say, 30% to meet the doubling requirement, to meet the 100% increase that is needed, even more in Sub-Saharan Africa but across the developing world by 2050. How are we going to get the other 70%? Only by increasing productivity and that in turn is going to depend on research, so I hope you will all support it. Thank you.

Mr. Reifschneider: Thank you. Dr. Otsuka, please. Your comments.

Mr. Otsuka: Thank you very much. I would like to say something about the gap between best existing technology and actual technology. Yes indeed the gap is important, but in the case of Sub-Saharan Africa, the best existing technology is not good technology. We need to develop better technology. As Professor Silts correctly pointed out several decades ago, farmers are poor because of a lack of technology, because of the lack of investment in human capital. We have to invest in research, from the CG side, and one important point that I want to emphasize is that there is a big difference between the Asian farming system and African farming system.

The Asian farm system is kind of independent. In the case of rice, farmers have to purchase fertilizer and seeds, then plant rice and then they harvest without much interaction with other sectors. But the African farming system is totally different. The farmers need manure. In order to produce manure, they have to feed animals. In order to feed animals, farmers must grow feeding materials. For that purpose, the crop fields must be sacrificed and then manure is applied to crops, and sometimes farmers grow agro-forestry trees, which have the capacity to produce nitrogen fertilizer. The system is complicated. But nonetheless, I say it is a mistake of the CG system. CG has IRRI, IRRI looks at livestock; CG has ICRAF which looks at trees; but where is the breeding institute in East Africa? None. How can you expect Green Revolution to take place in the context of Sub-Saharan Africa? That is my comment. Thank you very much.

Mr. Reifschneider: Thank you. I would like now to invite Dr. Von Braun for his comments.

Mr. Von Braun: This gives me an opportunity to thank our commentator Kei Otsuka for very favorable comments which hardly had any critique in them, very unusual for him usually. So I look for discussions after the session, Kei.

Let me address four points which have been made by commentators from the audience, very good points. On protectionism and the oversupply of subsidized agriculture products on the international market—yes, it is a fundamental problem. It requires correction and the steps in that direction are, from our perspective at the International Food Policy Research Institute, too slow. Especially the small farmers who have opportunities to enter the markets of the OECD countries with high-value product, high-labor content, high job content—those opportunities must be opened up quickly. It is however only part of the agenda. Let us not believe that solving the protectionism problem will solve the poverty problem in low-income countries. Low income countries have to trade more and more also with each other in Africa, within Asia and South-South. Those opportunities are hindered partly by ill-designed trade and market policies and also developing countries themselves. Roughly half of the problem is there.

Second point: unclear property rights. What does the CGIAR have to say about that? Is that not the fundamental problem? I think a very good point was made there. I am happy to say that we in the CGIAR understand the word CAPRI is not just the beautiful island in Italy but it is one of the most appraised inter-center cooperation called the Collective Action for Property Rights Initiative. More than 200 organizations and institutions and

all CGIAR centers cooperate in that; it is housed in my institute. It is driven by the idea that if you want to have good laws and good regulations, which do not hamstring farmers, these institutions have to be brought about somehow and that requires action, collective action, and communities which have a capacity to speak and to design these institutions. Institutions have the same problem as technology—they do not fall from heaven, they need to be created and that is what CAPRI stands for. So thank you for giving me the opportunity to say a word on that.

The reason that we spoke so little on genetically modified agriculture is probably because we do not have a problem with that. We do not have a problem with that. For us in the CGIAR, the key elements of new technology related to biotechnology and information technology need to be brought to bear on the problems of poor consumers and small holder farmers. Of course, I am hurrying to say sound bio safety policies are absolutely necessary for that and just two weeks ago, my institute together with two other CGIAR centers got a major grant to help developing countries move their bio safety policies faster so that they can benefit more effectively from safe application of biotechnology.

Last point: existing technology or new technology? Of course, both. Existing technology is so ineffective currently in parts of marginal lands and parts of Africa because of very weak relationships between research and extension and between research and the private sector, and because of the fundamental governance problems which Robert McNamara hinted at—or, no, he did not just hint at them, he pointed them out. Mr. McNamara does not hint. He points at corruption problems. We at IFPRI and our Board of Trustees—I am happy that our board members are right here—have made this an issue, a research issue: governance in the food and agriculture sector, including problems of corruption, of law making, ill designed law making, good law making, of decentralization and so on.

The CGIAR system as a whole, ladies and gentlemen, let me say that at the end, has a major advantage that it is decentralized around the world. It understands problems on the ground and it communicates with poor people and with high science, but bringing those two together of course is only effective if it interacts well with the national agricultural research systems. I think those are the ingredients of success of the past and they have to be nurtured for the future with your support. Thank you.

Mr. Reifschneider: Thank you very much. Let me just share a few ideas with you. I

think the complexity of issues that we deal with have been clearly identified by this discussion and the panelists, with the tremendous challenges that we have in order to insure that people's prosperity and wellbeing is indeed achieved. The central role of agriculture for this prosperity is clear and agriculture here *latusenso*. Yes it is about crops, it is about livestock, it is about fisheries, it is about forests. I think that together we have made a fantastic difference in the example of the Green Revolution of the past, the examples that we are going to be seen today and tomorrow give us reason for optimism. We need focus, we need strong partnerships and we need strong support. With that, let me ask you to join me in thanking the panelists for their contribution to this event.

I would now like to invite Mr. Yatsu for his closing remarks.

Mr. Yatsu: Now, in the second half of the seminar, we have had an active discussion moderated by Mr. Francisco Reifschneider, Director of the CGIAR, on state-of-the-art agricultural research as well as the outlook for the future. Thank you very much indeed. Mr. Von Braun, Director General of IFPRI, talked about agriculture for growth, covering issues such as the shortage of food as well as the prevention of hunger. I believe his observations were full of insight. Dr. David Kaimowitz, Director General of CIFOR, talked about the importance of sustainable forest management and how it can impact the lives of the people. After that, Mr. Adel El-Beltagy, Director General of ICARDA, talked about the experiences in Central Asia and Western Asia, talking about the post-disaster role of agriculture as well as the importance of water. Dr. Otsuka spoke from the vantage point of one about to become the director of IRRI from January of next year. He talked about the outlook for his new position. Thank you very much indeed for that.

Today we have identified the importance of agricultural research to find solutions for the 21st century, including the population problem, food shortage, etc. We have had professionals participate in the discussions today covering areas of agriculture and agricultural research. We have reconfirmed the importance of this area. From the postwar period to now, through international partnership, I believe that further efforts are necessary in order to build this partnership further between the developed nations as well as the developing nations.

Lastly, in closing, I would like to thank former Prime Minister Hashimoto, as well as Mr. McNamara, former President of the World Bank; as well as Mr. Ian Johnson, Vice

President of the World Bank. He talked about the US\$22 million. I am the Vice Chairman reviewing ODA, and this point that he made is something that I listened to with interest.

Now, in closing, I would like to once again thank the audience as well as the participants of this seminar today. Thank you very much indeed.

Secretariat: Ladies and gentlemen, just one housekeeping notice. For those of you from the Friends of the CGIAR and the media who are joining us for lunch, lunch is in the Bamboo Room on this floor of the hotel at twelve thirty. Thank you.