

Panelists:

Martin C.Th. Scholten,
Wageningen University, the Netherlands

Yasuo Watanabe, Policy Research Institute, MAFF, Japan

Yasuo Watanabe is director general of the Policy Research Institute, Ministry of Agriculture, Forestry and Fisheries (MAFF), Japan. His major field is agricultural policy and economics. He graduated from Kyoto University (in Japan) and entered MAFF in 1977. He worked at the Organisation for Economic Co-operation and Development (OECD) between 1991 and 1994.

Tokio Imbe, NARO, Japan

Tokio Imbe holds a Doctorate degree in agriculture from Kyoto University (in Japan) and is vice president of the National Agriculture and Food Research Organization (NARO) at present. He was director general of the NARO Kyushu Agriculture Research Center just before the present position. He worked as a rice breeder at the Kyushu National Agricultural Experiment Station and at the NARO Institute of Crop Science. He also used to work at the International Rice Research Institute.

Akinori Noguchi,
Ishikawa Prefectural University, Japan

Masahiro Shoji,
Morinaga Institute of Biological Science, Inc., Japan

Masa Iwanaga, JIRCAS

Masa Iwanaga received his Ph.D. in plant breeding and plant genetics from the University of Wisconsin (in the United States) in 1979. He was named president of JIRCAS in April 2011, after serving as director general of the National Institute of Crop Science (NICS) at the National Agriculture and Food Research Organization (NARO). He has a long career working with CGIAR centers, including the post of director general at the International Maize and Wheat Improvement Center (CIMMYT) (in Mexico).



Panel Discussion

Strengthening Japanese Agricultural Competitiveness through Collaboration with Asia



Kazumi Yamaoka

Japan International Research Center for Agricultural Sciences


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The purpose of the wrap-up session with panel discussion

- To find out a new direction of strengthening international competitiveness in Japanese agriculture, forestry and fisheries taking into consideration the deepening of globalization and a rapid change in the structure of food demand and supply and that of rural society in Asian regions
- To discuss the way of applying outcomes of international researches to the new direction

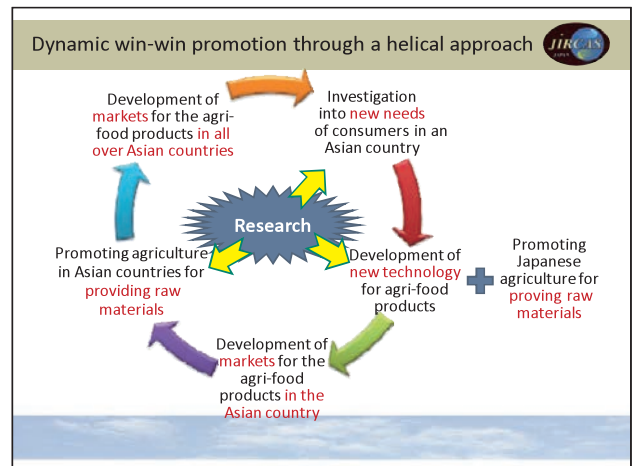
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The agenda of the wrap-up session with panel discussion

- **Special Speech:**
Feeding the World within the Carrying Capacity of Planet Earth: The Netherlands approach in smart agri-food business
- **Panel discussion:**
 - Important topics during the earlier sessions
 - Agri-food research and technologies to realize strong competitiveness of agriculture in Japan concurrently with contribution to Asian development
 - Views, ideas, ways of making best use of international research networks, financing and what panelists want researchers and institutes to do
 - A session of questions and answers to open up a new research field
 - Conclusions

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Chair Yamaoka: Thank you very much. Once again I would like to introduce the panelists at this juncture. From the right we have Prof. Scholten, Martin Scholten, Professor of Wageningen University. Next, Mr. Yasuo Watanabe, President of the Policy Research Institute of MAFF Japan, and Dr. Tokio Imbe, Director of NARO Japan, Dr. Akinori Noguchi, Professor of Ishikawa Prefectural University, Dr. Masahiro Shoji, President of the Morinaga Institute of Biological Science, and Dr. Iwanaga, President of JIRCAS.

Now I shall be serving as the moderator of this panel discussion.

Now we have just heard from Prof. Scholten about the advanced case of the Netherlands. I'm sure you have a better understanding. On a personal note I'd like to mention that 20 years ago I was working in the Japanese embassy in The Hague for three years. Based on this experience I'd like to briefly talk about the comparison between the Netherlands and Japan.

First let me talk about trade. According to the UNCTAD organization statistics, in 2011, the most recent data, the value of exports of agricultural products and foods was 1.383 trillion dollars worldwide. And No. 1 in terms of ranking is the United States at 131.3 billion dollars. Second is the Netherlands at 114.8 billion, and that's 8.27 percent out of the total. Third is Germany, and then Brazil and France, around 70 billion dollars each. Number six is China exporting significant agricultural products to Japan, at 54.2 billion dollars. Japan was ranked 52nd at 4.6 billion dollars; therefore, Japan exports only one-twenty fifth of the Netherlands.

Now let's compare the Netherlands and Japan from a different perspective. The population of the Netherlands is 16.8 million, for Japan 127.8 million. So the Netherlands population is 13.1 percent of Japan. It's about 20 percent higher than the population in Kyushu island of Japan. And the area of the Netherlands is similar to Kyushu island. But its 46 percent of the land area, 1.92 million hectares, is farmland. In Japan's case it is 4.56 million hectares at 12.2 percent.

The total exports of the Netherlands are 666.2 billion dollars, and agricultural products and food is accounting for 17.2 percent. For Japan, 822.6 billion in total and agriculture, and food products is accounting for only 0.6 percent. The ratio of 17 percent for the Netherlands is akin to the ratio of automobiles within the exports from Japan that is including passenger cars, trucks, buses, as well as chasses.

Agricultural products and food products of the Netherlands is similar to the automobile industry of Japan, so you will probably think that Dutch agriculture, fisheries, forestry ratio with respect to GDP is likely to be much higher than Japanese one. I also thought so, but in reality it is only accounting for 1.4 percent. And Japan is 1.1 percent, so there is not a significant difference with respect to the ratio to the GDP.

So we should be able to imagine how much value is added to the agricultural products and the food products before export. So we should not feel pessimistic while Japanese agriculture is only 1.1 percent out of GDP.

So there is the possibility that it could be as powerful as the automobile industry. There is nothing denying that. There are tulips, flowers, in terms of the agricultural products of the Netherlands. This is the No. 1 export amount in the world, then potatoes, tomatoes, tomatoes are No. 1, also cucumbers No. 2, mushrooms No. 2, and beef No. 4, and cheese is third, beer No. 2, and tobacco No. 1. And many of the exported agricultural products of the Netherlands are processed products; the first in amount is cut flowers at 12 percent, second is cheese at 4.3 percent, third is tobacco at 4 percent, fifth is prepared foods at 3.9 percent, and sixth is beer at 2.4 percent.

If we compare the Netherlands to Japan, the preconditions differ significantly. In terms of land area, in the Netherlands the land is very flat. Top of Mt. Fuji at 3,776 meter is the highest in Japan but in the Netherlands the highest point is 321 meters and that is even lower than Tokyo Tower at 333 meters and one-fourth of the land area is below sea level. And 60 percent of the population living there, there is a concentration of industry in these

areas. And the remaining areas are used for agriculture as well as livestock industry.

So the Netherlands is a plain and it is different to Japan where 70 percent is mountainous. And there is high concentration of the population in the narrow flat areas of which land prices are very high in Japan. And Japan is islands country surrounded by the sea while the Netherlands and the western European countries are connected by land, where they have a market with strong purchasing power. So that doesn't mean that Japan should copy the Netherlands completely, but there is certain common sense prevailing while the Japanese people believe another common sense.

I think we can learn from the Netherlands that there are other ways, there are other options. For example, yesterday the keynote speaker Konuma-san mentioned that for Japan, for the greatest importing country of agricultural products, the importance of food security was emphasized. The risk of a country like Japan must be mitigated, and he outlined the policies as well as the strategies that will be required.

In concert with him I have a question in my head. Before going into agricultural products as well as processed food export, there should be perhaps a prioritization of enhancing the food security of Japanese people. But when you think about this carefully, while the export of agricultural products and processed food is export to people's mouth living overseas, if the processing industry of Japan becomes strong like that of the Netherlands, then the agriculture to provide materials for the food processing industry will get the opportunity to become strong. Some agricultural products produced in Japan are not eaten by Japanese but fully added value to and eaten by people living overseas. This is one option that we should consider, and if this will strengthen agricultural production in Japan, then it should contribute to the food security of Japanese people.

Therefore, I would like to ask the panelists the following. For the past two days we have heard from the speakers in each of the different sessions as well as heard from Prof. Scholten in the special lecture. Now I would like to know what is the direction that you are contemplating for Japanese agriculture, forestry, and fisheries research that will cater to the needs of the future?

Now Watanabe-san and Imbe-san, you are making first appearance here, so please also talk about your backgrounds when you speak as well. So I would like to first of all ask Mr. Watanabe to speak.

Mr. Yasuo Watanabe: Thank you very much for designating me. Let me introduce myself. I am Yasuo Watanabe, Director General of the Policy Research Institute of MAFF Japan. When I made a proposal for a toast last night I mentioned this as well, we are studying social sciences. We are located in Kasumigaseki, and usually what we are looking at is the policy planning being projected by MAFF, providing support and assistance. That is our fundamental mission. And as for the tools, we are looking at economic instruments for instance, and therefore we are a little different from the expertise of the speakers. We are from the social sciences side, but I was profoundly interested in all of the information that I received from yesterday and today.

So Mr. Yamaoka of JIRCAS wanted to ask my impression about what I've heard over the past two days. As one of the persons engaged in policy studies, I would like to share with you some of my impressions.

I think there are probably three points that I wish to make.

First, over the past two days, hearing the series of presentations, I felt that in sustainable technological studies, what is the division of the role between the public sector and the private sector? Of course looking at the results of various policy studies, the public sector is playing a great role that would depend on the specific circumstances of the country as well as the areas of research, but on the other hand, there is an area where the business sector, the private sector, is playing a greater role. So what should be the division of work between the public sector and the private sector in terms of technological development? How will we be able to well collaborate between the

public sector and the private sector and if necessary have a division of labor between the two sectors? I was strongly impressed about this.

Particularly in the case of Japan, in terms of socio-economic development, Japan is more advanced compared to most of the countries in Asia, but as you might be aware, the role to be played by the public sector is being replaced by an increasing role by the private sector in many, many areas. In agriculture and food sector, in order to achieve technological development, what will be the division of the role between the public sector and the private sector? That is a crucial question. So that was the first point I wanted to make.

Now moving on to my second point is I think Dr. Zhou from China when he spoke yesterday mentioned this, but in terms of genetic engineering, the GMO, when we approach this issue, what is important is the public acceptance issue. In developing a new technology, from a scientific viewpoint it might be a correct direction, it might be new scientific knowledge and that in itself does have value, but whether this will be publicly accepted in terms of agriculture, in terms of food, I think public acceptance is important, and GMO is one such example.

In MAFF, with regard to genetic engineering, we are extremely sensitive about this issue. I think this is similarly applicable to other countries. In the food supply issue of China Dr. Zhou said that GMO is to be highly rated. Will GMO be accepted by the public in China? What about the global communities' acceptance? So I think that is of great importance.

The third point, the final point that I wish to make is that this has already been faced by our Policy Research Institute, consistency with international discipline. Yesterday we talked a bit about standardization. International discipline is a powerful force indeed today, for instance in the area of food, we have Codex and in the WTO agreement there is the SPS agreement or TPT agreement and they are quite powerful nowadays.

So going forward with further advances in technology, food and agricultural products are trying to make improvements of substance, we have to take into account the international discipline because it might cause trade friction if this is not addressed, so we need to take due consideration of international discipline. So this is my impression from listening to the presentations over the past two days. So I shared with you three points that were on my mind.

Chair Yamaoka: So, Dr. Imbe, please.

Dr. Tokio Imbe: My name is Imbe from NARO, I just arrived. Yesterday I could not participate the preceding sessions because of other commitments. I would like to apologize that I will make a comment without the discussion about the preceding sessions.

The National Agricultural Research Organization (NARO), where I belong, is the biggest agricultural research organization in Japan. Prof. Scholten talked about his research department in Wageningen University and our size is about the same as their research institute.

Before going into the new needs, in terms of the basics, the stable provision of food is the function that we need to realize through technological development. If you think about rice production, the number of rice producers are decreasing and they are aging, and we need to promote the forming of corporations of rice producers. And in regards to that, we have to discuss what kind of technological development is needed when “the Agriculture on the offensive” is pursued in Japan.

In regards to the new needs, in regards to rice, we have to discuss how we pursue new demands, how we can open new demands, and if we are producing as is, there would be an excessive amount of production and there would be a lot of surplus. I think what we need to do going forward is to put more value added, for example, to utilize

rice as rice powder to create bread as well as noodles. Those kinds of technological developments are necessary for the future.

We need to have higher quality crops. And in the future we need to consider exporting to our neighboring Asian countries.

NARO institutes have had a lot of collaboration with the other organizations around the world. In the case that we go to developing countries, we tie up with JIRCAS, and sometimes we will have our staff dispatched as JIRCAS personnel to work overseas.

And in the case of myself, I am a rice breeder and I have worked in Malaysia and the Philippines through JIRCAS. And that's one way to have collaboration and contributions with overseas countries. I would like to emphasize the relationship of NARO and JIRCAS. That's all. Thank you.

Chair Yamaoka: Prof. Noguchi, please.

Dr. Akinori Noguchi: Now regarding the issues raised by Yamaoka-san are very important. If we take the example of Ishikawa Prefecture, we can say that the population is 1.15 million and the food industry ratio with respect to GDP is 10 percent. Now the primary industry ratio is less than 1 percent. Therefore, it is a microcosm of what has already been explained. At the prefectural level we have the same issue, that is how we should understand this prefecture.

In the Hokuriku area, Ishikawa prefecture, my concern is relating to the fact that we are going to be racing against time. In Japan, before technologies are developed, the agriculture, forestry, and fisheries could be deteriorating from the ground. We will lose ground there, and that is very clear. In terms of the mid- to long-term strategy, in line with that we have to also formulate the short-term strategies as well. That is extremely important for this region.

In terms of short-term strategy as well as tactics, we have to be specific; otherwise, the stakeholders will not be mobilized. Therefore, one technology will not suffice to resolve the problem. So it is like solving an equation without any solution, so it can only be a temporary solution at best and we have to struggle until we have a better solution. Food technology can only play a partial role in this regard.

What is also important is the primary, secondary, and tertiary industries. These three industries must work together for promotion going forward. From Japan to overseas the same will hold true.

Primary industry cannot cover everything; that is impossible. If we take marketing for example, primary industry cannot fulfill this role, so there has to be a stronger push from the industry side as well. What has become clear is the leadership or the coordinator is lacking. This is the same challenge faced everywhere. Therefore someone with global knowledge, and even when the system is imperfect to be able to combine the necessary components together to mobilize what is available is lacking. We do not have enough coordination. We are trying our best to nurture such human resources and they can be active overseas as well.

Regarding the six industrialization, what I am combining primary, secondary, tertiary industries, can be of reference for overseas countries such as Asian countries as well. That's all.

Chair Yamaoka: Thank you very much for speaking about local circumstances. May I now call upon Dr. Shoji?

Dr. Masahiro Shoji: Since I represent the private sector, a while ago Dr. Watanabe had spoken about the collaboration between the public and private sectors and also the need for standardization, so I would like to

continue on that topic from the private sector perspective.

As I mentioned earlier, we are involved in the food allergen business, and with regard to food allergens, international standards are being discussed and formed. European countries, the United States/Canada, they are playing central roles in international standardization. International standards, as was mentioned earlier, will have important meaning in the context of international trade.

In the case of Japan, the food allergen regulation announced that the regulatory line of food allergen is drawn at 10 ppm, and this is applied for controlling the food here in Japan. However, this is very special, namely no other country has regulatory limit. In Europe, the threshold point of allergic reaction is being elucidated and searched for based on evidence, *i.e.* by the challenge to food allergic patients. And this threshold point will be the basis for the regulatory limit in future. According to European tentative results, for instance, in terms of milk and eggs, where the threshold might be higher than 10 ppm, it would be 30-50 ppm, but in the case of peanuts which might cause allergy shocks, the threshold should be lower to 3-5 ppm. That is being discussed. If that is going to be adopted as European and further the international standard, food products controlling food allergen by Japanese regulatory limit 10 ppm have a difficulty to export the same food products under international peanuts regulatory limit 3-5 ppm, it means that the product will infringe the international standard (3-5 ppm) in the exported market. While Japan may not well-aware that European discussions are proceeding with regard to international standardization. Once the final international standard is announced, Japan needs to follow, and has to adopt the production of export food products to meet the international limit of 3-5 ppm.

Practically, we will need to differentiate the production lines for the domestic Japanese market and for the export market which has to be controlled by this limit of 5 ppm. Under enhancing the export of agriculture, forestry, and fisheries products, the Japanese food industry has to bear this in mind at all times. Also the Japanese government has to involve more in the construction of the international standard.

In terms of food allergens, Europe and the United States are the main figures of international standardization, however what about Japan? When it comes to food allergen regulation, Japan started the regulation in 2002 which is one of the earliest, Europe adopted the regulation in 2005 and the United States in 2006. Also, we have far advanced regulation system, additionally have accumulated past experience of food allergen management as the pioneer.

Another issue is the government system. The process of the international standardization is conducted by the representative of the countries, the private sector cannot advocate or replace. In Japan, food allergen labeling regulation is under the jurisdiction of the Ministry of Health, Labor and Welfare (MHLW). However, MHLW mainly pay attention to domestic affairs in Japan, also its budget seems not to plan foreign affairs. We are trying to provide the assistance to MHLW, but feel some limit. Meanwhile, the Ministry of Agriculture, Forestry and Fisheries (MAFF) is paying a lot of attention for the international market because it's interested in exports. Accordingly, we got the MAFF funding to our expansion to Thailand, though our technology was coming from MHLW issue.

Who is going to take the initiative? Is it going to be MAFF or is it going to be MHLW when it comes to international negotiations and discussions on international standardization of food allergen? Frankly speaking, the food allergen regulation might be under the MHLW, I can say. However what about others, because food allergen is only an small example. So I think Dr. Noguchi was correct. There is no control tower of commanding Japanese national interests, and there might be a stalemate. Also, Japanese government is not playing an adequate role to make the necessary appeals in the international community, although Japan has lots of technologies, knowledge, experiences. This is really a pity.

Chair Yamaoka: Dr. Iwanaga?

Dr. Masa Iwanaga: We are the organizer of this symposium so I am in that position, so the position that I am standing in is a bit different from the others so I would like to speak from that perspective. JIRCAS holds international symposium each year and our objective is by hosting that kind of symposium we would like to look back at what kind of path we have been walking and what kind of future is there for us.

Our organization is very small with only a little over 100 personnel, and we would not be able to do everything by ourselves, and so we have collaborations with NARO, as Dr. Imbe has mentioned, and we have support from other researchers in order to provide international cooperation.

So we consider not only JIRCAS but also Japan overall on what kind of initiative should be taken in the future. In the past day-and-a-half there has been so much information provided and I have not been able to sort out everything yet, and I've not been able to announce what kind of initiatives JIRCAS is going to take forward. However, our aim was to make this international symposium something different from the previous years.

In the past we considered what kind of support can be provided to overseas or what kind of collaboration we can have with foreign countries, but this time around, not only that, but we wanted to consider the position of Japan, I mean in regards to how strong we can make our country's position.

The Japanese government is aiming for the creation of aggressive agriculture, forestry, and fisheries, and with that perspective in mind we wanted to think about the position of Japan. So that was the objective of this symposium.

There were so many insightful presentations given in the symposium.

Well, it's been 20 years since we started to using the name JIRCAS. We used to be TARC before, and our organization, including our preceding organization, it's been 40 years since we have been working in Japan. Our role was to support developing countries and that was the axis or the very platform of our existence, and we have been having collaborative work with local people by going out to overseas countries and we found out there were many challenges in the agricultural area. And what we have found is that it is not just a problem of developing countries but it's issues of global magnitude, like climate change, pollution in the sea; it's a global agenda.

We are living in Japan but what's happening in other countries will be directly impacting us in Japan. So going forward we have to have this mindset of not working for just supporting the overseas countries, but we are working with the people of other countries to benefit everyone globally. And in the past we were focused more on ODA, but now we are having the mindset of working together; it's a joint research approach. By capitalizing on the strength on either side, we are walking towards a path of providing a solution to worldwide problems.

Another point was mentioned in the keynote lecture yesterday, that Japan, in terms of food, is a big importer. The calorie-based self-sufficiency rate is not just one index that would look at the capacity of their country, but we only have a 39 percent calorific self-sufficiency rate. If we bring the self-sufficiency rate up to say 50 percent from 39 percent, we still have the question of what do we do with the remaining 50 percent? So we have to think of global food security in order to secure food security in Japan.

With this in mind, how do we live our lives and how can we play our role as a global citizen are questions that we have to answer. We are an organization of researchers so we have to tackle these issues in a most efficient manner.

I think yesterday and today were important occasions where we would be able to consider these issues. In the opening remarks I utilized the term globalization. Some people say that it is Americanization, globalization equals Americanization, and this term globalization sometimes is interpreted negatively; however, the world is

becoming flat rather than round, so we have to collaborate with each other, and rather than protecting each country through building walls, this is not viable any more, and rather than thinking about building walls in between, we have to think of going beyond the wall and we have to consider how we can create a win-win situation around the world.

More specifically speaking, as it was mentioned in today's discussion, Morinaga Institute is having a joint venture in Thailand, so we have to have a standard, a standard for food allergens in Asia. So in the technological development, we have to create safety standards, safety technical standards, within Asia so that we can create a world where consumers can feel safe eating food, and with that, we would be able to have safe mobility around the world.

What interested me the most is the population issue. The population is increasing and food production increase is stagnating, but it's not only the issue. Urbanization and an aging society like you see in Japan, are also big issues. There will be a big change in agriculture and food security. Japan is the most advanced country in experiencing that, and there are many reflections that we have to make, but on the other hand, I think that the learning that Japan had in the past can be utilized in various countries around the world.

This discussion is related to the demographics but these days agriculture is becoming a lackluster industry and there are not many people who pursue a career in agriculture. That's one problem. And another point is that the people who enroll in department of agriculture don't know about the field of agriculture. It's not only the students but also the professors – they don't know what's going on in the farmers' field. Even if they look at wheat or barley, they would not be able to tell the difference. Not only the students but the professors in departments of agriculture, probably half of them would not be able to tell the difference. And the department or school of agriculture is becoming very similar to the department of biology.

So the academia-industry collaboration must be worked on more aggressively and it will not come naturally, so we have to work hard on it. And as Dr. Shoji mentioned about the progress in Thailand and JIRCAS was able to play a role in that, so we would like to do more.

I would like to work not only with the private sector but with other research organizations such as NARO, and the government sectors. I would like to provide as JIRCAS more support to play the role of bridge between Japan and the world both in the private and public sectors. We don't want to do just research. We want to play a role in the creation of frameworks. That's what I was thinking about while attending yesterday's session and today's sessions. Thank you very much. I talked too long. Sorry.

Chair Yamaoka: Thank you very much. So we have heard from various speakers, from various perspectives, and I believe that for the most part the objectives of the panel discussion have been fulfilled already. But I do have a question to the panelists at this time. You can answer by yes or no, so raise your hand accordingly, and if you are no, don't raise your hand.

The theme of the panel discussion here was “Strengthening Japanese Agricultural Competitiveness through Collaboration with Asia.” This is a rare topic that we have taken up. It's a very aggressive theme that we are tackling. So we would like to realize the contribution to Asia as well as enhance the competitiveness of Japanese agriculture at the same time. So we need to have the agriculture, forestry, and fisheries technological development which will realize this. Does this exist in the first place? Can we have both objectives achieved, contributing to Asia as well as enhancing the competitiveness of Japan? Do you think it's necessary to find such a direction and should we pursue that?

So please respond by yes or no. Please don't look at others. Those of you who agree, raise your hand if your response is yes. Thank you very much. Prof. Scholten, what is your view? Now for the Japanese panelists, they

all responded by saying yes. In fact I have other questions that I wanted to pose to the panelists but we have taken significant time already, so let's avail ourselves of this opportunity by having a Q&A period to make use of the time.

Now audiences in the floor can address the panelists now at this time. I'm sure the panelists have different perspectives. Do they really think that we can have such a win-win relationship? But apart from that, there is a necessity to do so. I'm sure that is a prevailing view. So inclusive of these comments, please raise your hand if you have any comments or questions. And please also state to whom the question is addressed. Please raise your hand. Go ahead. I see a hand up from someone sitting in the third row. Could you state your name and affiliation?

Question: I am from "Beautiful 21st Century," it's an NGO organization. Dr. Scholten, you did not raise your hand towards the last question, so are you for yes or are you for no? And when it comes to improvement of the competitiveness of the Netherlands, what are you doing in order to enhance the level of competitiveness in the Netherlands?

The question is we, our research in the future, should go two ways at the same time? One is to contribute to Asian countries and the other one is to contribute to strengthening our Japanese agriculture, forestry, and fisheries. Do you think it is needed or not? That's the question.

Dr. Scholten: Yes, thank you for the question and I didn't raise my hand because I was not fully aware of what was the question but everybody raised their hand so it should be there. But also listening to the other panelists, I'm thinking of the position of Japan. It has been said that Japan is an importer, a main importer of foods, so it's important to know about what's going on in the world. Globalization leads to very rapid changes in these positions. And Japan is in the middle of Asia and Asia is a growing agro-food business economy. So how do you position yourself as a country importing with a lot of exporters in the future around you?

Probably when you look after the Netherlands, it's the other way around. We are living in Europe which is importing and in thinking, the European policy is thinking about, yes, the problems that may arise from the fact that we are now importing but food is necessary elsewhere in the world, and the Netherlands is within Europe an exporter. So probably we can share there something.

One, I think you, as Japan, have to take part in the agro-food development in Asia. You cannot be isolated from that and you have to share the experience and you have to work together with the agro-food business development in Asia.

When we are active in Asia as Netherlands research, it's always along with the business because there is business in Asia, there is a lot of business in Asia, and that business requires support from science and it requires support from research.

So, yes, I really recommend that Japan takes up that position. And Japan has a position. When I'm looking for my experience in the global network, the agricultural science in Japan, the agro-food science in Japan, is of a high level, and that means that you have a duty to share that high level of knowledge with the developing economies and that you can contribute to sustainable development in those developing economies. And it was already said in the panel, yes, that's important because Japan is dependent, as all we on planet Earth are dependent, how the agro-food development in the upcoming economies is being organized. So I think that's my main message.

And there are differences between Japan and the Netherlands, so don't copy the Netherlands' approach, but you can be inspired and you can inspire, and I think that's, and as long as you respect that there are differences in the world, cultural differences, ecological differences in the world, and there is no one-size-fits-all, there is no green revolution where the American system is the best. I don't think that is the globalization that we had in the last

century. As long as we do that, then it's good. Science follows the sector and science enabled the sector to develop in the right direction.

One thing, one remark I have regarding your point, when I look in the Netherlands, the Ministry of Agriculture is now part of the Ministry of Economic Affairs. When I look in other European countries it's part of the Ministry of Rural Affairs or the Ministry of Environment, and that makes the difference. Wageningen University is not belonging or not covered by the Ministry of Sciences; it is covered by the Ministry of Economic Affairs. We have to take account that food production is *the* big economy in the future because we have to feed the world, and agro-food is business, is an economy, and that agro-food science should be business supported and therefore should be close to the hearts of the ministers that understand how important the economics of agro-food are in the world of economics.

Chair Yamaoka: Thank you very much. So it means that we have to take care of our own house. Twenty years ago in the Netherlands, I think the Dutch people have very good rationale, so several times my Dutch friends and colleagues would tell me that I have to be more business-oriented. While you might feel that it is survival of the fittest in the case of business, I think that business which is being aimed for by the Dutch is a win-win relationship, so you have to come up with the wisdom and good ideas. You have to approach it from a business perspective or else you would be bound by the conventional approach. You have to first make the investment, and if you put up the money you have to go through with it. I think that is the approach that the Dutch people have in general.

So could I get the response from the panelists? Dr. Iwanaga, please.

Dr. Iwanaga: I should not be monopolizing the floor, but the Japanese, say, in terms of export and import, as the moderator has said, the United States might be the largest exporter but it is also the largest importer in terms of agricultural and food products, so it's on a net basis that US exports are above US imports, so I think we are living in a world of interdependence. So what I wish to emphasize as the message, of course I raised my hand, yes, to the question by the moderator, but recently I am frequently considering this question.

When you talk about prawns or shrimp, lobster might come to mind, but you might often hear whiteleg shrimps. Up until three years ago you might not have been aware of the existence of whiteleg shrimp. Japan is almost totally dependent on imports of shrimp. Ordinary citizens could not eat shrimp years ago but now ordinary Japanese can enjoy shrimp.

The whiteleg shrimp was reported for the first time about three or four years ago. In Vietnam and Thailand, this aquaculture farm of shrimp, whiteleg shrimp, and the import price for the Japanese market was raised by 50 percent and I also received a phone call at my research institute. They did not know what whiteleg shrimp looked like so they wanted a photograph.

But how many Japanese researchers exist who are studying shrimp diseases? We have none actually in JIRCAS, but in terms of breeding we have a few experts who are aware of their reproduction. We have been highly dependent on shrimp but we are not aware of the disease which is being spread among shrimp. We have no experts who have expertise on shrimp disease.

And another matter that I wish to allude to is of course the most dependent crop for Japan is rice, 59 kilograms per capita per year, which is on an annual basis, so such a high volume. But I think we are importing 13 million tons of corn but most is being used for feed and not for human consumption, but corn is considered to be an important crop, but in terms of crop experts, how many Japanese researchers have degrees specializing in corn?

So actually a publisher or mass media asked me the question of how many Japanese scientists have expertise on corn, we have one researcher who obtained a degree in the United States, but he converted to another crop.

I think the Japanese younger generation is inward-looking, and not only that, but if we look around the world, even the researchers who must have a global perspective seem to have a low level of interest in terms of anything that falls outside the domestic scope of Japan, so we have to make efforts in terms of human resources development.

Chair Yamaoka: Prof. Noguchi, please.

Dr. Noguchi: So what I'm going to mention may be a little bit different from what Dr. Iwanaga mentioned.

The characteristic of the food industry in Japan – well, correct me if I'm wrong – I think most of the companies, 97 percent, are SMEs. And I think Morinaga would be 1 to 2 percent. At the SMEs, if you think about the opportunity of employment that they provide, it's 8 million, and they are the core of the local industry and they play an important role in providing employment. However, with the reduction of the population in Japan and the shrinkage of the market, the SMEs are dwindling, and when that happens the agricultural industry may receive a negative impact from the shrinkage in the market.

The technology as well as industry which has high potential must go out to the overseas market in order to have collaborations overseas in order for Japanese company survival, and when this is accomplished, a win-win situation can be seen. The local resources overseas can be utilized and the channel to bring in the local resources overseas to Japan would be opened. The good quality goods can be brought to overseas and competitiveness can be secured, and the win-win structure can be built through this initiative.

So what do we need? Dr. Shoji talked about the food industry partnership and how a country and the research institute would be able to work together in the private sectors would be critical. I think what Wageningen University is doing is exactly what is being pursued. And there is a gap there at this moment. Aggressive agriculture is talked about but the private sector is left out. The private sector is not receiving enough support from the government, so I wanted to mention that.

Chair Yamaoka: Mr. Watanabe from the government side, do you have anything to add?

Mr. Watanabe: Well, thank you for the question. As Noguchi-san has mentioned, I understand where he is coming from very well. In terms of economics, there is an industry linkage table that is used. We have looked at the GDP share, it could be 1 percent or below, and in terms of forward as well as backward linkage we have to take into consideration the impact from the local area. In regional areas agriculture has a significant ratio. But we can be surprised about the size and so the industry linkage table can be useful in this regard.

As Noguchi-san has mentioned, in terms of the SMEs and the regional area, it is playing an important role in terms of securing employment. Therefore, it is very significant in that regard. We have to be fully understanding this point.

In terms of national support, this is an area where I cannot talk to you in a personal manner, but as I mentioned at the outset, the roles of the public sector and private sector, in the case of agriculture as well as the food industry, compared to other industries, such as automobiles or the steel industry, the relationship is significantly different. That is my view.

In this regard, it is likely that in the development stage of agriculture at the moment or the current situation surrounding agriculture, as well as Japan's position, as well as the Asian position, depending on the situation, the place, the support that can be rendered by the government can undergo significant change. It will be different. And the ratio to be played, the role to be played is becoming smaller for the public sector. There is the advent of neo-liberalism. However, in this regard, there are changing views. In the 1980s and 1990s the neo-liberalism

view was prevalent, was dominant, but now is the time for reconsideration.

As already mentioned, at the global level, global environmental problems as well as market principles will not resolve all the problems before us. And therefore, between the public sector and private sector, the roles as well as the introduction of market mechanisms are facing a very important turning point. That is my impression. I hope that will suffice. Thank you.

Chair Yamaoka: Dr. Shoji.

Dr. Shoji: Dr. Scholten has spoken about Japanese food manufacturing technology, and thank you very much indeed for your compliment. We boast ourselves on this. We take pride the advanced Japanese technology in this area, and have to think how Japan is able to leverage the Japanese technology from a strategic viewpoint, there might still be room for question on that note.

We are temporarily transferring Morinaga technology to Kasetsart University in Thailand, and by doing so, we believe that not only the technology itself, but also our basic philosophy and concept to approach toward the technology would be transferred to our Thai counterpart simultaneously.

We are establishing an alliance with Kasetsart University. With Dr. Warunee, who is here with us today, we have worked on food allergen management technology. In the discussions for technology transfer, we introduced and referred how the technology is being applied in Japanese industry, so we can reach deeper mutual understanding level, and this might be so to say the transfer of Japanese technology to Thailand.

Then, Kasetsart University, which is quite effective in Thailand, has become our close partner of food allergens in Thailand. In the course of my presentation, I have not mentioned that the survey data obtained by our research works with Kasetsart University and Chulalongkorn University were extended to Thai FDA through Kasetsart University and Chulalongkorn University providing as fundamental database of Thai government. And Thai FDA is under revising Food law, which will incorporate Food allergen labeling. Two members of the food allergen labeling regulation committee of Thai FDA were chosen from our research partners. Through these partners we, Japan, can provide our philosophy and concept to Thailand. And Thailand is the major country of ASEAN, accordingly Thailand can spread Japanese philosophy and concept to ASEAN and further Asian countries. Those will be the countries understanding Japanese philosophy and concept hopefully, and the candidate of the alliance of Japan.

On the international standard front, Europe and the United States are the major initiatives, but none from Asia, although food standard should be taken account of physical characteristics and local food habits. Here in the Asian region, Japan is able to propose fundamental ideas of Asian standard, but if Japan tries to go ahead directly, perhaps there are difficulties in terms of our relationship with China or Korea.

Accordingly, we might propose the Japanese standard to Thailand, for instance, because Thailand is close to Japan and Japan is importing lots of agricultural and food products from Thailand. Then Thai manufacturers will get used to Japanese standard when they export to Japan. Additionally, many Japanese food manufacturers who know about Japanese standard, have already operated in Thailand exporting back their products to the Japanese market. These would be the supporters of philosophy and concepts of Japanese standard. Then these manufacturers will influence to Thai government, and then Thailand will influence to surrounding countries.

We believe that the increase of food technology level in Thailand and other Asian countries shall finally reach to a win-win relationship with Japan.

Chair Yamaoka: Thank you very much. Dr. Imbe, please.

Dr. Imbe: I would like to briefly talk about the win-win situation. Iwanaga-san mentioned about this. The collaborative research is changing. We are now conducting a joint research and the level of the research is being upgraded.

Many, many years ago when I went to Malaysia, it was more about transferring technology to local people, but the initiative now is to work together to come up with a solution together to the problem that we are both facing, and that's a win-win situation. For example, at NARO we have the Institute of Animal Health, and the institute has a joint research project with people in Thailand. The avian flu has become a huge issue and a solution to the problem would be considered together by the researchers of both countries, and this kind of collaborative research would create a win-win situation in the future. There are many areas that we can work together on, like food, and working on these areas would be very important.

So win-win is one keyword.

Chair Yamaoka: Now I'd like to show you the last slide. Yesterday we started with Konuma-san's keynote speech and we have also received presentations from various speakers. And I have hit upon an idea, since this is difficult to explain, I have come up with this diagram. This is entitled, "Dynamic win-win promotion through a helical approach." I borrowed this term of "helical" from Prof. Scholten.

Now it is following a helical approach, starting with the development of markets for developing needs in Asian markets. Researchers will go there to investigate the new needs of the consumers in Asian countries which will necessitate the development of new technologies. As Shoji-san mentioned, it could be from the point of view of allergens. Functional drinks and foods are other possibilities. For processing those products high levels of technology, quality control and marketing are required in the agro-food industry and Japan can be brought to bear here.

And providing high quality raw materials will be required as well. In this way, Japanese agricultural production can be promoted further.

Thereafter, based on investigation we have to identify the markets where the product can sell. And it will be in one Asian country at first, but we should not remain complacent. We must do our best to expand the market to other Asian countries. On the other hand, as mentioned in Thailand, it is also an exporting country, so Thailand can become a provider of raw materials.

Japanese agriculture will be the primary provider and can develop thereafter, but as markets expand, the materials can be supplied not only from Japan but also from Thailand as well as Malaysia, and all the other nations as well. Therefore the agriculture, forestry, and fisheries industries can be promoted in those Asian countries as well.

The market will be expanded all over Asia subsequently, and we move the base of raw material production to Asian countries, so this will complete the cycle, and since it is a helical approach we have to find new needs in terms of investigation. And once again, the agriculture, forestry, and fisheries in Japan will benefit first, and by expanding the market we will accompany other Asian nations. And this can be continued in a helical approach. I'm not saying that this is going to resolve all the problems, but this is one idea that could be considered.

By so doing, we can reevaluate Japanese agriculture. It is very sophisticated and high value can be added. Ninety-seven percent could be SMEs (Small and Medium-sized Enterprises), but it doesn't mean that they don't have outstanding technologies. They can be specialized and there are many SMEs with outstanding technology in their given area. And we should not just be focused on selling products in Japan; that is not the age we live in at the moment now. We have to develop products which can be sold in overseas markets through the SMEs. Research will require collaboration. This is what I am imagining the future to be.

From yesterday we have been tackling this major topic, and in terms of solutions, this is one idea that I am providing, but based on this type of idea we have not been doing enough in terms of nurturing younger researchers, and this is the issue we have to resolve, the academic issues. And also we have to pursue international agricultural research for the future. This is something that we would like to continue to promote into the future. That is my solution, my conclusion rather.

Thank you very much for the long hours of cooperation. Thank you very much to the panelists.

Thank you very much for the cooperation from the audience as well. With this we would like to bring this panel discussion to a close. Thank you very much indeed.