

## PANEL DISCUSSION

### Ohto

Let me introduce the panelists. Starting from the left side is Dr. Machi F. Dilworth, Head of the NSF Tokyo Regional Office. She is originally from Japan. She graduated from the International Christian University, went to the US on a Fulbright scholarship and entered UCLA. There she has received her MA and Ph.D in Plant Biology. She worked for the Directorate for Biological Sciences at NSF, and has served in her present position since 2007. Next to Dr. Dilworth is Dr. Jaeyong Hur, Counsellor of the Embassy of the Republic of Korea to Japan. Counsellor Hur received a Ph.D in Chemical Engineering from the Tokyo Institute of Technology, and is fluent in Japanese. At the Korean Embassy, he is in charge of coordinating and promoting bilateral cooperation between Japan and Korea in science and technology. Next is Dr. Visweswaran Navaratnam, Asian Representative for DNDi, an NGO founded by Medicins sans Frontieres that develops medical treatments for tropical infectious diseases. He is a senior professor of Clinical Pharmacology at the University of Science in Malaysia. Next to Dr. Navaratnam is Dr. Barbara Rhode, Head of the Science and Technology Section of the EU Delegation to Japan. She received her Ph.D in Political Science from Catholic University in Nijmegen, NL, joined the Headquarters of the EU, and served as Advisor for International Relations to the FP7's "People's Program" (Marie Curie Grant), and "Small and Medium Sized Enterprise" Actions under the Directorate General for Research of the European Commission. The next panelist is Dr. Xiangping Ruan, Counsellor of the Embassy of the People's Republic of China in Japan. He graduated from the Department of Materials Science of Tohoku University in 1984. He was Consulate-General for China in Fukuoka, and Director of the Division of Asia and Africa at the China Science and Technology Exchange Center. He has been Minister Counsellor of the Chinese Embassy in Tokyo since this January.

The next panelist is Mr. Saito from the Agency for Natural Resources and Energy at METI. He is Director General of the Energy Conservation and Renewable Energy Department of that Agency. He graduated from the Department of Aeronautics and Astronautics of the University of Tokyo in 1983. He joined the Ministry of Trade and Industry, and served as Assistant Director of the General Affairs Office of the Agency for Industrial Science and Technology and the Economic and Industrial Policy Bureau, and as Director of the Budget and Accounts Division of the Ministerial Secretariat, Industrial Revitalization Division of the Economic and Industrial Policy Bureau. He has held his present position since 2009.

The last panelist is Dr. Noppawan Tanpipat from Thailand. She is Assistant to the

President of the National Science and Technology Development Agency (NSTDA) of Thailand. After graduating from Prince of Songkla University, she moved to the US, and studied Quantum Chemistry at the University of Tennessee where she received her Ph.D. After that, she worked for several companies including several venture companies and IBM for more than 20 years. In 2006, she returned to Thailand to become Deputy Executive Director at the National Nanotechnology Center. She was appointed Assistant to the President of NSTDA in 2008. Finally, I will introduce the moderator for the panel discussion, Mr. Atsushi Sunami, from GRIPS. He graduated from Georgetown University in 1983, and received his Ph.D in Political Science from Columbia University in 2001. He returned to Japan, worked for Nomura Research Institute, joined GRIPS, where he became Assistant Professor in 2003, and Associate Professor in 2007. Professor Sunami, please.

Moderator (Mr. Sunami):

Thank you for the introduction. I have been studying public policies in science and technology and innovation at GRIPS. I am also a member of the committee for strategies for international collaboration in science and technology organized by the Takeda Foundation. During the first half of the symposium, members of the committee explained the structure and systems for an Asian Research Area based on discussions held within the committee. However, as pointed out by Dr. Shiraishi, former Vice President of GRIPS, in his keynote speech, those discussions were limited to Japanese, even though the committee members have certain knowledge and experience with the rest of Asia. During this panel discussion we hope to hear the frank opinions and feelings of representatives of the foreign science and technology communities concerning the concept of an Asian Research Area. We hope that the panelists will take into consideration the concept of open regionalism when they discuss the Asian Research Area. It is essential to integrate opinions and thoughts from Asia, Europe and the US in the process of constructing the Asian Research Area, so we would like to hear the frank opinions and feelings of the panelists today. First of all, I would like each panelist to comment briefly on the concept of an Asian Research Area, indicating what they consider to be important points that can be addressed through regional collaboration in science and technology. After that, I hope for an interactive discussion among the panelists that I will also join. Finally, I would like to hear comments and opinions from the audience, and expand the panel discussion into a floor-wide exchange. After the panel discussion, Mr. Arimoto will summarize the major points raised during the panel discussion, and provide an overview, which I predict will not be

easy.

Today, we have panelists representing foreign embassies, and I would like to hear their opinions from either an official or personal point of view. First, I would like to hear from Mr. Saito. When we started discussing the concepts for an Asian Research Area, the very first thing that came to my mind was the Human Frontier Science Program that was started through a Japanese initiative to promote international collaborative research during the Nakasone administration. It was Mr. Saito and Mr. Arimoto who struggled to bring the Program into reality as the persons in charge at METI and MEXT. Mr. Saito must have many things to say about the hurdles that must be overcome in developing a framework for international collaboration in science and technology based on his experience during the launch of the Human Frontier Science Program. After Mr. Saito, I would like to hear from Counsellor Ruan of the Chinese Embassy, and then from Counsellor Hur of the Korean Embassy. I must admit that this sounds like a Japan-China-Korea collaboration, but I chose this order because Vice Minister Nakagawa of MEXT, who will be at the get-together party following the symposium, is a strong promoter of the Asian Research Area, and traveled in Asia this past May to discuss our proposal. I accompanied him, and we traveled from Japan to China, and then to Korea. Therefore, I would like to hear from Mr. Saito from Japan, Counsellor Ruan from China, and Counsellor Hur from Korea. After that, then I would like to hear from Dr. Navaratnam from Malaysia, Dr. Tanpipat from Thailand, Dr. Dilworth from the US, and Dr. Rhode from Europe. Mr. Saito, please.

#### Mr. Saito

Thank you for the introduction and for inviting me to the symposium. As Mr. Sunami said, I was involved in the creation of the Human Frontier Science Program. We were hoping to create an international organization resembling EMBO (European Molecular Biology Organization) to promote collaborative research. If the headquarters were located in Japan, we thought it would be difficult to obtain the cooperation of other countries, so we planned to locate the headquarters in France. As I listened to the discussions about an Asian Research Area, I thought that this would involve the creation of a funding agency to provide research grants, scholarships for researcher exchange, and funds for workshops. I also thought that it would be useful to build a platform in Asia where researchers from Asian countries can exchange ideas and perform cooperative research. I wouldn't know how to react if someone asked me to guarantee a financial commitment from METI on this, but a panel discussion is not the place for budget requests. So without committing, I can say that the idea of a regional

platform is very attractive.

METI has a similar program called the “Asian Human Resource Fund” that supports foreign students studying in Japan, and then to help these students find jobs at Japanese companies after they graduate. The Asian Human Resource Fund will end this year. METI also founded a think tank called “ERIA (Economic Research Institute for ASEAN and East Asia)” in Indonesia that acts as an Asian OECD. Perhaps the Asian Research Area can collaborate with these systems. In addition, the goal of developing useful devices at very low cost is similar to the grass-root programs of ODA. The development of Asian standards for goods and services should be considered, and the cooperation of Europe, the US, and other countries should be sought to help in formulating these standards. Also, an Asian graduate school where students from different countries can meet, study, and continue to communicate with one another even after graduation would be a possible feature of an ARA. This last is my private wish. These are the points I would like to discuss during the question and answer time.

Moderator (Mr. Sunami):

Thank you for your comment. Now, I would like to ask Counsellor Ruan for his comments.

Mr. Ruan:

I am Xiangping Ruan from the Chinese Embassy. Thank you very much for giving me this opportunity to speak. After reading the proposal for the ARA by Mr. Arimoto, Mr. Sunami, and the other committee members and listening to today’s presentations, I think that the general concepts are very good. However, from a practical point of view, the creation of a regional research area that covers the whole of Asia, and in which all Asian countries can participate, is very challenging because of the large number of countries, the huge populations, and the wide differences in economic prosperity from developed countries to developing countries. Different parts of Asia face diverse problems depending on the size, population, and level of development. Some of these problems are common to many countries while others are limited to a single or only a few countries. During the realization process it will be important that the Asian Research Area develop its own measures and roles for addressing the problems faced by many Asian countries. Furthermore, there are already many cooperative mechanisms in Asia including ASEAN + 3, the Japan-China-Korea circle, ALF, EAS, LCD, and APEC. We should consider how an Asian Research Area should fit in with the many existing cooperative mechanisms. In this context, I think the word “research” is bit too narrow to

represent the activities of regional collaboration in science and technology, and so I propose the “Asian Science and Innovation Area” as the name for the regional collaboration being discussed today. This name is clearer and covers high-technology areas as well as grass-roots innovation. It can also cover industrial technologies including the new energy and energy conservation technologies that Mr. Saito addresses at METI. Under the name of “Asian Science and Innovation Area”, many countries can participate based on their own interests, and act to address their own problems. This is the first point I would like to emphasize. Another point is that it will be difficult to create a regional platform for collaboration in which all Asian countries can participate from the beginning. I propose using the existing cooperation frameworks, such as ASEAN + 3. ASEAN + 3 has been playing a leading role in regional cooperation in Asia. Once the new platform based on ASEAN + 3 is established, then it would be possible for other countries to join at a later date. Mr. Sunami mentioned that the Asian Research Area should not be limited to a Japan-China-Korea circle, but I think that these three countries should take the lead in creating the regional collaboration mechanism because these three countries have higher levels of research infrastructure, larger numbers of researchers, and higher amounts of R & D investment than other Asian countries.

Moderator (Mr. Sunami):

Thank you very much, Mr. Ruan. Next, I would like to hear from Counsellor Hur from the Korean Embassy.

Mr. Hur:

Thank you very much. I was really impressed with the previous sessions announcing the concepts of the Asian Research Area and describing its horizons. Japan already has a lot of experience in leading these kinds of international programs, the Human Frontier Science Program being one successful example. I personally welcome this kind of initiative by Japan, but we have to think about the short-term and long-term goals. First I want to talk about the situation in Japan. Japan is ranked number two in the world in terms of S & T investment, but Japan is not an open society, including in its S & T and innovation areas. One of the problems with the closed nature of Japanese society is that the stakes are high for domestic issues rather than foreign pursuits. Some of the speakers in the previous session mentioned that Japan can not maintain its economic prosperity without international cooperation, which, at first, would probably involve Asian countries. In this regard, I want to raise the question of public opinion concerning this

kind of open strategy in S&T areas. I know that it is the experts that must lead this kind of discussion, but some consensus on S&T must be achieved, and I don't think that the average man in the street understands such trends or directions, the changes in S&T policy, or what international cooperation in S&T would entail. Let me discuss a smaller scale cooperation, not a big regional cooperation that includes all of Asia, but one that involves only Japan, China and Korea. Last year, the second S&T ministerial meeting was held here in Tokyo, and we agreed to launch a tri-lateral cooperative program. That program is now on the horizon, and by this May, I hope that an agreement will be reached on the investment fund for this tri-lateral R&D cooperation program. The Asian Research Area initiative has been initiated by some leading groups, but the momentum among Asian governments is not very strong. As mentioned by Minister Counsellor Ruan, we should utilize the existing momentum in the private or government sector such as at the STS Forum led by Mr. Koji Omi or some other university coalition in this area. In my opinion, further discussions of the Asian Research Area initiative are needed at the governmental level as well as the private level. The private sector is more active and shows a more positive response to this kind of initiative. As to the fields of cooperation to be addressed by the Asian Research Area, I fully agree that the environment, energy, infectious diseases, and disaster prevention should be priorities as they represent problems common to all Asian countries. Finally, I believe that some sort of balance is needed between short-term and long-term-goals. If we attempt to initiate an Asian Research Area, invest in an Asian Research Fund, establish a technology assessment center or technology incubation center all at once, then short-term successes will be very hard to come by. Therefore, some kind of corner stones that represent intermediate goals are needed. This is my humble opinion. Thank you.

Moderator (Mr. Sunami):

Thank you very much. Counsellor Hur has pointed out some very specific issues and proposed several options about how to promote the Asian Research Area. The committee members frequently discuss how to obtain the support or consensus of the general public for collaboration with Asian countries. Later, I would like to discuss this matter with the audience. We have now heard from Japan, China, and Korea. Next, I would like to invite Dr. Navaratnam from Malaysia to speak.

Dr. Navaratnam:

Thank you very much. The articulation of the idea is excellent, but getting it to work is

the hard part. I don't think there is going to be any dispute about idea of an Asian Research Area, but the problem is how we will make it a reality. My first question would be do we see the Asian Research Area as a funding body like the EU, or as a strategy driver to a regional research program? Very careful and systematic planning is needed because the expectations of the different countries involved are going to vary. What are the key performance indicators they are going to impose on you as the driver of this initiative? Another factor is that ASEAN is not homogeneous, but instead heterogeneous in terms of GDP and RND with Japan, Korea and Singapore at the top, then a drop where countries such as Malaysia fit in, then dropping further with Myanmar at the very bottom. So when a collaborative platform is developed, these realities need to be taken into account. We can acknowledge that there are common regional problems, but the resolutions of these problems have different priorities among the different countries. One approach would be a cluster approach in which those countries that see a certain problem as the main priority (e.g. food security) form a group to tackle that problem. This approach simplifies the process of determining the areas of research that need to be addressed, prioritizing them, and getting consensus on the prioritization. By the bottom of the pyramid concept are we thinking in terms of empowering the people, or are we talking about the affordability of the technologies developed to these people? The pump example represents empowerment, but it will be sold; therefore, it represents a cross between affordability and empowerment. The challenge is worthwhile, but it needs to be taken in small steps. Overall, the Asian Research Area is going to take research for teaching and knowledge transfer, which represents human capacity building, from both industry and society for the public good (the neglected bottom of the pyramid), but also for private profit, with the net goal of increasing the incomes of the countries concerned. The concept is excellent, but the question remains as to how these goals can be achieved. Thank you.

Moderator:

Thank you. Next, Dr. Tanpipat, would you care to comment.

Dr. Tanpipat

Thank you Mr. Chairman. As the representative from Thailand, which is one of the founding members of ASEAN, I understand the gaps within ASEAN. I heard many times today about "ASEAN + 3"; we also have "ASEAN + 6", and soon there will be "ASEAN + 8". We also have the GMS, that is, the Greater Mekong Sub-region. We have many forms of relationships within ASEAN, and although it's been more than forty years since

it was established, things have not gone very far. One reason for the slow pace is, of course, finance. But beyond that, for the first many years it was led by the Ministries of Foreign Affairs with no real public discussions or sharing with public stakeholders. Finally, in 2004, public NGOs got involved, and now things are getting better. We are now approaching our closest milestone in 2015, when all ten ASEAN countries, will be connected by road, rail, air, sea and ICT.

Two weeks ago, I spent two days in Brussels with the current and incoming presidents of NSTDA along with our colleagues from ASEAN, representatives from Malaysia, Indonesia, and Vietnam, to meet with the 7 representatives of the FP7 (the Seventh Framework Programme for research and technological development of the European Union) from among the 10 NCP (National Contact Points). This year I became the NCP coordinator for Thailand, which means my involvement with FP7, whose platform is exactly what you are trying to imitate with the ARA. I am also the person in charge of international cooperation for NSTDA. That means I am quite familiar with FP7. I've seen the similarities to FP7 on a small scale in our organization. So, in theory, I support the idea of the ARA. However, it will not be easy. It has taken a long time for FP7 to reach the point where it is now. What impressed me most in Brussels is that whatever you want to know about agriculture, food, health, energy, the environment, or anything else, there are materials to read, and all publications are in English in the European Commission building, and all documents are ICT based, that is, paperless. To get that far you have to build a critical mass. You have to build up the human resources, talents, and products that will be realized. For this, the EU has a cross-cutting scheme that is very brilliant. As an Asian person working in a European scheme, I wish to see that repeated in Asia. I know that Asia could go even further, and much faster, but it will not be easy. One country can not solve the problems that face Asia. We want to attack them as a region. For example, concerning the problems of climate change and energy transition, the European Union has declared an end to the use of fossil fuels by 2050. That's very aggressive. The problems of ageing populations or emerging infectious diseases are not things an individual country can face alone. You need expertise. Everyone knows that. With that in mind, I think we know where we are going. Thank you.

Moderator:

Thank you very much. That concludes the Asian panelists' comments. The concepts are good, but we need to take specific actions that are not easy. How to do this is the most difficult question. As Dr. Tanpipat pointed out, the EU uses English as a common

language, but I am still using Japanese while we are discussing the Asian Research Area. We are still far away from the development of a regional collaboration platform in terms of a common language. Now, I would like Dr. Dilworth to comment from the US perspective, although she is a Japanese and knows Japan very well.

Dr. Dilworth:

I was born in Japan, but had been away from the country for almost 40 years. I have now spent the last two and half years here, and one thing I have noticed is that Japan has become more open to international interactions. Even ten years ago, when I spent 9 months at Riken, I was struck by the fact that there were no rewards to researchers for participating in international collaboration either monetarily or in terms of professional recognition. But I think that is beginning to change. The role of the National Science Foundation is to support basic research in all areas of science and technology, and science education at all levels. So I will focus on one area of the ARA plan, which is supporting of research activities. The NSF has always been very proactive in promoting international cooperation. From the very beginning, since the US Congress established the NSF in 1950, one of its responsibilities has been to foster cooperation in international science and technology. Early on, the focus was on managing programs under bilateral agreements, such as the US-Japan Cooperative Agreement in Science and Technology, which was signed by President Kennedy and Prime Minister Ikeda in the early 1960's. But over the years, science has become increasingly global, and international cooperation has become part of the culture of the science and engineering research and education communities in the US. The current NSF Director, Dr. Arden L. Bement, Jr., has said that international cooperation in science is not a luxury, but rather a necessity and a foundation for the future, and that is how the NSF views international cooperation. Our support for international collaboration has two aims: to advance the frontiers of science and engineering, and to prepare a globally engaged next generation of the US science and technology workforce. From that perspective, we have great expectations about this concept of an Asian Research Area. We will be very happy to work with an organization such as the ARA for three main reasons. For one, two major objectives of the NSF in supporting international activities are to advance the frontiers of science and engineering, and to nurture the next generation of scientists and engineers, and these objectives will be enhanced by working with the ARA. Second, we have a new initiative called Science, Engineering, and Education for Sustainability (SEES). This includes research on climate change, energy, the environment, and biodiversity, and cooperation with the Asian scientific communities will be critical if we hope to make

any significant advances in these research areas. Third, science diplomacy is another high priority area for the NSF, and also for the Obama Administration. So the NSF has partnered with the US Agency for International Development, a JICA equivalent, and the Bill and Melinda Gates Foundation to support collaborative research with developing countries. And the Obama Administration has launched the US Science Envoy Program, which is designed to build partnerships with, initially, Moslem communities, and to seek common science-based solutions to global challenges. Many of the target countries for these programs are in Asia, and it makes sense to coordinate our activities with an organization such as the ARA. We will be watching with keen interest the development of the current concept of an ARA, and we will be very pleased to share our experiences gained in working with diverse partner organizations and programs at the global and regional levels.

Moderator:

Thank you very much. Now I would like to ask Dr. Rhode to comment. Recently I served on a task force for a science and technology meeting addressing educational issues. It was pointed out that it has taken the EU 50 years to become what it is today. So what about Asia? We are just now starting. How long will it take to catch up with Europe and what conditions will be necessary? Of course, there political will, political initiative, among other factors. Based on the European experience, I would appreciate your comment about this, and an optimistic comment would be especially welcome.

Dr. Rhode:

Of course. What else can be expected but a positive comment? First of all, we are very proud that Asia is looking to Europe, and that small Europe can serve as a model for big Asia. But perhaps first I could give a brief overview of the European Research Area, because the concept for it stems from only 2000, making it a very recent development. Importantly, it had the backing of big political organizations that wanted to work together, thus providing stability. There was the feeling of a crisis in Europe because of the new technologies arising in Asia and the US. Although Europe was good in engineering, materials, chemistry, and other traditional fields, it lagged in the new ITC. Now we have 27 countries, each with its own science and technology investment and patterns, and our philosophy is that we would like to establish a European landscape out of the national investments. Thus we are spending not more than 5% of our total expenditures to build the framework program. But with 27 countries, some of them quite powerful, over seven years we have had a sum of 6.6 trillion yen available for distribution. But

mechanisms are needed to accomplish this distribution, and the practicalities of these mechanisms are very important. So as mentioned earlier, transparency, independence, and excellence are important concepts for the procedures developed. Money previously owned by member states is now somewhere else, so there is a demand to see that the money is spent in the right way. I think the charm of the European Research Area lies in the diversity of its members; for example, we speak 23 different languages, although English has been established as the common language, at least for science. We have big countries and powerhouses in science and technology, and we have small countries. Malta, for example, has a population of only about 300,000, but it has a university that is 400 years old. So space research may not take place in Malta, or the full scale of biotechnology, but there is excellent aquaculture research there. However, if there were a group in Malta interested in space research, they could pursue it because there is this bigger European Research Area, and within this Area there are partners with whom to collaborate. Alone they could not succeed, but you are always bigger because there are partners everywhere. I have some example projects displayed in the hall. I have selected three programs that include Japan as a partner, and they are very different from one another. Two are at the level of 4 million Euros; all involve a number of international partners. One important project in which China is a major participant is a water management project. This project includes specialists from The Netherlands, because The Netherlands does a lot of research on water management. There are also specialists from Spain, who bring quite a different expertise, because the water management challenges of The Netherlands and Spain are quite different. So you get people with the same qualifications and backgrounds, but very diverse understanding and knowledge. Merging this type of diversity is a strength, not a weakness. We are sometimes accused of being too bureaucratic, but you have to have procedures whenever you are giving out money. Currently, about 20% of proposals are accepted meaning that 80% are rejected despite the enormous budget.

Moderator:

Thank you. That's a very encouraging story. We will have difficulties with many aspects of this idea. Now, coming back to the issues in Japan, I'd like to ask Mr. Saito to comment; also I would like to hear from the Committee members as well. So we will be asking for your comments later. Now, Mr. Saito, please.

Mr. Saito:

It's been quite a useful discussion. In order to achieve these goals, a budget needs to

be developed in each country. Therefore, people who can exert pressure to develop such budgets will have to participate and agree with the ARA concept. In that case I think it important to select appropriate research areas to be addressed in the ARA. When we developed the “Human Frontier Science Program”, we organized a meeting of so-called wise men by inviting intellectuals from participating countries, and asked them to promote the program with their governments. This is one effective approach toward developing new international programs. Researchers tend to focus on their research and it is difficult to have a fair discussion on science policy among actual researchers. Members of the wise men group should be representatives of the scientific community of each country. At first it is important for the proposer to decide what to do in the ARA, and then proceed step by step taking into consideration the existing cooperation schemes mentioned earlier by Mr. Ruana.

Moderator:

Now I would like to ask the committee members for their comments. Professor Kobayashi.

Professor Kobayashi:

The levels of development in science and technology among Asian countries are so different, and the sizes and populations of the science and technology communities also vary greatly, which makes the process of coordinating an Asian Research Area quite challenging. But the Asian Research Area should not be just for the science community; it should be for the people who live in the region. As there are many different stakeholders, the consensus reached should not be only among scientists. If a so-called people’s power emerges from Asian society, that will be the determining factor, although Japan might be the last country in Asia that develops a people’s power movement.

Dr. Watanabe:

I think that it will take two or more years just for negotiations if things are carried on among governments. So how can governments, NGOs, and private companies all collaborate? We need a citizen level perspective, especially for the concept of a sustainable society. If governments discuss officially the starting point, then I think it will take forever. Therefore, I am proposing that specific issues, for example, as food additives and agricultural chemicals, be tackled by calling for the participation of various actors including governments, private companies, and NGOs. If they voluntarily participate in addressing specific issues, this could trigger the start of regional

cooperation. As I was listening to the panel discussion, I came up with the idea of digging into a starting point in specific ways; then this would lead to the next step toward a regional collaboration in Asia.

Mr. Suemori (JICA):

I feel that partnership is very important. In the past, Japan has provided technological transfer to developing countries. But now we need to think of this Asian region as a partner, and it is very important to develop a win-win situation with Asian countries. To do so, we need to think about how to introduce investment into the regional cooperation. It is important to obtain the support for regional cooperation of the entire society including governmental and private sectors. Although we have to focus on the themes to be addressed, we need to realize that collecting funds from various sources is very important for developing regional cooperation, and the promotion of people exchange should be considered as human resource development in the region. My only concern is the treatment of intellectual property rights (IPR) in the development of the products of collaborative research. It will not be easy to handle IPR from international collaborative research.

Moderator:

I don't see any other committee members right now. So going back to the discussion we were having, as mentioned by the keynote speaker, until fairly recently, Japan was the primary power in science and technology in Asia. It is now questionable whether Japan will remain a big power in economics and science and technology in 2020. It is certain to say that Japan is not the only big power in Asia anymore now that China has advanced. If we look at economic history in early 1900s, we can see that China was one of the leading economic powers in the world at the time. In this respect, the situation that China has grown to be a big power is not new. What is different this time is that there are now two big powers, China and Japan, coexisting in the same region. Given this situation, I think that the perceptions of the Chinese people concerning the concepts of an ARA and their thoughts about it are quite important. So I would like to ask Mr. Ruan to comment on the perceptions of an ARA by China.

Mr. Ruan:

Thank you very much for the question. You refer to China and Japan being joint powers in Asia, and that has happened for the first time in history. But I would like some clarification about definition of big power. By a big country, do we mean the size of the

population? Well, population-wise, India may become bigger than China in the future. Or does “big” refer to the total GDP? Well, some people predict that China will surpass Japan in terms of GDP by the end of this year. Or are we referring to the overall well-being, or GDP per capita, or research funds per researcher, or the number of researchers per 10,000 population? Well, the total number of researchers in China may exceed that in Japan, but per 10,000 persons, perhaps China has fewer researchers than Japan. So everything is relative. I mentioned that the three countries, Japan, China, and Korea, should take the lead in creating a regional collaboration mechanism, if we use an existing cooperation framework such as an ASEAN + 3. I think that it is very important for these three countries to start regional collaboration in science and innovation for the future development of an Asian community. At the end of this month there will be a Japan-China-Korea summit held in Korea, and these three countries are preparing to issue a joint statement to promote cooperation in science and innovation among the three countries. China is very positive about this initiative, and if a joint fund is going to be established, the specific amounts to be contributed by the three countries have been proposed. So expanding this cooperation initiative may be a very positive way to go forward. Of course, China has its own challenges as well, and we may not be able to solve these problems single handedly. There are many problems that can be addressed in better, easier, and faster fashions by international cooperation. China has been experiencing some of the problems Japan experienced earlier, and some other Asian countries will experience the same problems in the future. The differences in developmental phase may cause difficulty in creating regional collaboration mechanisms, but at the same time one can learn from the experiences of other countries. If we create a regional collaboration platform, we can predict future problems and decide what to do to address them based on the past experiences of other countries. However, it is important to establish mechanisms to coordinate actions in the collaboration area. There have been a variety of ministerial meetings among China, Japan, and Korea. Last year, I participated in the second tri-lateral meeting of science ministers with Counsellor Hur, and next week, the 12<sup>th</sup> tri-lateral environment ministers meeting will be held in Hokkaido. There are many meetings among the three countries. Cooperation in science and technology is discussed at these meetings, and usually are set in the vertically structured administrative systems of each country. However, an international collaboration requires higher levels of coordination from the viewpoint of national priority setting in science and innovation. This kind of coordination mechanism will be needed when the ARA is created.

Moderator:

Thank you very much.

At the end of this month, there will be discussions and a joint declaration concerning science and technology made by Japan, China, and Korea. Korea has very actively proposed joint research, and calls for an infrastructure to be established in that regard. Domestic discussions in Korea have led to the proposal that collaboration should be strictly about state-of-the-art technologies. Is that correct?

Mr. Hur:

I think that green innovation is a global topic nowadays, and perhaps green innovation forums will be held at the upcoming tri-lateral meeting. Another thing is, as mentioned before, that human resource development, especially the exchange of young researchers, will be discussed as one of the topics of the tri-lateral cooperation. That can be the foundation for cooperation in the long run making it more robust. Another topic is the development of bottom up approaches in research. At this moment I think that green innovation and an exchange of young researchers program are hot topics among the three countries. Thank you.

Moderator:

Thank you very much. There has been some discussion, about cooperation among the three countries, but how is ASEAN going to participate in this kind of a proposed framework? ASEAN is not monolithic; there are differences among ASEAN countries. S&T levels are diverse among ASEAN countries. So let me ask you, Professor Navaratam. We are talking about the three countries as a starter, but what do you have to say about the possible involvement of ASEAN?

Dr. Navaratam:

Taking ASEAN as a generic group, there is an example of an operational model in Japan. That is the Pan-Asian Network for Natural Substances for Neglected Diseases, which included Japan, China, Thailand, Malaysia, Indonesia, as well as a number of other countries. This is a framework that I call a cluster because some countries, for example, Laos wanted to join, but could contribute only plants, not the S&T people, and Thailand played a leading role. So within the structure you could say that some part of the work will be done in Japan while some other part is done in Malaysia, thus giving an international framework for cooperation with five or six partners where the topic is accepted. In the case of neglected diseases there is a universal voice to help the poor

and neglected people whether they are in Bangladesh, The Philippines, Indonesia, or wherever. But there are some diseases for which there are no medications, or only inappropriate medications. So that could be a proposed target, and then one could ask how many countries would like to work on this problem and invest in it. That would be a multiple theme approach. I don't see a problem of ASEAN collaborating because there is prior experience. For example, in a collaboration concerning the treatment of tuberculosis, Thailand because of its prior experience in working on TB was the lead group. Another major player was Singapore where the Novartis Institute was established. The history of Novartis actually goes back to the coalition, but the institute was established in Singapore because Singapore agreed to co-share, making it cheaper for Novartis to build there. But if you look at the Novartis institute, there are Thai researchers, Malaysian researchers, Filipino researchers, and so forth. So my contention is that I see no problem with ASEAN linking with the bigger countries. But the targets need to be focused, and it needs to be recognized that one target may not include all ASEAN countries, but only those countries with the interest and/or technology to participate.

Moderator:

Thank you. Now I would like to invite Dr. Tanpipat to comment.

Dr. Tanpipat:

What came to my mind due to my long residence in the U.S. is the Silicon Valley. In my opinion, there were four factors that allowed the Silicon Valley to progress from a dot com to sustainability. The first was excellent education, with excellent universities (UCSF, Stanford, Berkeley, etc.) and excellent researchers in the area surrounding Silicon Valley. Second was the availability of venture capital. Third was the existence of a network of high caliber friends. The last was the existence of a risk-taking nature, which epitomizes the American culture. What I am leading toward is that S&T is borderless; S&T doesn't have culture. If there is an incentive to apply for funding, the various players will come, but there has to be mutual interest and mutual benefits to be gained. I believe that every nation has outstanding researchers. They might not have the opportunities that researchers in other nations have because of funding limitations or something, but if you make it equal opportunity, they will come. And coming back to the FP7, if you look at the statistics for 2009, the average project has six countries and 14 organizations involved. So if the system can be made fair, and have an impact on the local community in Asia, then I think the ARA will work. But the devil is in the details, and

these need to be worked out.

Moderator:

Thank you. Next I'd like to ask the NSF representative to comment, because the NSF has been quite active in international cooperation, including with Asia. In the U.S., global research and development are pursued in a more open way. It is probable that NSF cooperation will involve Asia more and more, and so from this perspective I'd like to invite the last comment from Dr. Dilworth.

Dr. Dilworth:

We have participated in collaborative activities with the EU, for example, so I think that NSF working with the ARA does not mean that we will stop working with individual countries within the region. I think that the more opportunities and different mechanisms there are for international cooperations, the more opportunities to benefit everybody. Another thing I wanted to mention is that successful collaborations we have had are those in which all the participants have something to offer, be it facility or talent or unique ecological environment, or even specific phenomenon to address certain questions so that everyone benefits. Another thing is that young researcher exchanges are essential if you want the overall collaboration to work.

Moderator:

Thank you. I think that the Asian Research Area can benefit from discussions about specific matters such as cluster approaches and networking. Based on the discussion of the Silicon Valley experience, global and cluster collaborations have already been established in research fields, and only politics and policies may have lagged behind. In Japan, we have a fund to promote science and technology research, and the fund has a program for collaborative research with Asia and Africa. I am involved in the project selection process of this program, and every year we evaluate more than 100 proposals. When I evaluate proposals, I feel that they tend to take a top down approach that does not satisfy bottom up research needs. There are a lot of collaborative research projects in Asia, and there are many researchers who want to pursue research on his or her own interests, but the present collaboration mechanisms do not support bottom up research. That's why I would like to create a regional research platform such as an ARA to support bottom up research. As mentioned by some of the panelists, clusters and other unconventional frameworks are coming into existence, and I think that the ARA can

construct a platform for bottom up research without spending a lot of money if it takes such various approaches and forms networks among a variety of Asian researchers. This could be a dynamism for the ARA. Now I would like to solicit comments or questions from the audience.

Audience 1:

I am a Japanese citizen. As Mr. Saito mentioned before, I think that it is important to think of the theme, and in that sense I'd like to propose that peace in Asia is critically important. Peace in the world is very important. No war and no terrorism are very important. For a peaceful world, food is very important. So I would like to propose that increasing food production would be a good theme for research in science and development in this ARA program.

Moderator:

Thank you. Mr. Saito, would you like to comment?

Mr. Saito:

No, I have no comment.

Moderator:

Are there any other questions or comments?

Audience 2:

I'd like to thank the panelists for their clear presentations pointing in a nice direction. I agree that selecting the theme for the ARA is very important. There is one thing that I haven't heard. When it comes to the technology platform and collaboration, there have been many efforts made in the private sector. So when it comes to state-of-the-art S&T with lots of potential social value, the big global corporations have been working on them, and, in many cases, collaborating. I am afraid that Japan has been closed, so that Japan is lagging behind, and Japanese corporations are dropping out of international competition. So we feel uneasy. We need friends in Asian countries. I am very worried about this atmosphere. We are about to lose, so we want Asian friends, and we want these friends to take care of us. Maybe the people in Southeast Asia and other places are seeing this situation and feeling skeptical. So why do we need this ARA? What is the spirit? I want you to revisit the basic thinking why we need ARA. Look at the U.S. and the EU. Rich countries cannot control the whole world. Think of the economic crisis

and other global issues. Individual countries are relatively powerless compared to big international corporations. We live in a capitalistic society, and governments can't stop capitalism. A small portion of rich people control the economy of the country, and politics can't perform its corrective power. I don't think we should stop capitalism; innovation needs to be pursued. However, I think that Asian countries should cooperate to help people who are left behind the present prosperity. Let's stop negative thinking such as that we should sell nuclear power plants because South Korea sold one to some country, or that Japan should be left behind in the natural resource war since China has already put her hands on them. We should think about what to do to help people lead a happy life in Japan, which will become poorer and poorer in the future. This way, we can build a common ground with developing Asian countries. I really wish you would to set themes in the ARA by considering how technology can work to help people lead a happy life.

Moderator:

Thank you very much. You really made a point! When Japan makes a proposal for an ARA, what is the Asian perception of that, and what is the hidden agenda of Japan? Well, we try to be careful in that regard. Perhaps Mr. Arimoto would like to comment, but for now, could I ask Mr. Saito to address this point?

Mr. Saito:

Well someone else mentioned the increase in food production and I think that that's a good theme. I'm sorry, but I have to talk about the money up front. If there is not enough money available, then we have to look for another way; for example, young person exchange programs can sometimes produce even bigger results than research grants. The Korean panelist pointed out the closed nature of Japan, and I think that this is a big problem for Japan. Even when funds for overseas research are available, the number of people who don't want to go and study overseas seems to be increasing. Even in my organization, there are many young people who do not want to work abroad, and that's a very fundamental problem that needs fixing.

Moderator:

Thank you very much. Well, I'd like to close this discussion after Dr. Rhode's final comment. Dr. Rhode, I'd like to have your encouraging, positive comment before we close.

Dr. Rhode:

I can only say again, of course a positive comment. I think that this has been a fascinating round, and I have learned a lot. I'd like to say that yes, at the moment the US is the best country of the framework program that is not a partner. There are traditional boundaries and exchanges, and also brain drain, but all this can all contribute in the end to building up something new. International property rights were mentioned, because that is always a big fear. But in the case of cooperation and competition, I would say don't be too afraid of the competition, and don't be too afraid of collaboration because both are necessary. Both are very important in order to get good research projects established. We have a mechanism in which we say we will pay, but you partners make an arrangement before you start. We don't want to see it, but you make an arrangement because we don't want to have conflicts afterwards. But we don't interfere. So rely on the partners to know what they want, what benefits they will receive, how they can stabilize the relationship, and what they will gain from it. Also, in the past I have worked on ethics because cooperation between countries with different values is not always easy. Today I heard the concept that perhaps something we can't do here perhaps we can do there. Be careful about this. We look very closely at our projects and ensure that the international aspects are on a firm legal basis. Each country can do within its own country what it wants to do, but this always has to be part of the thinking. The culture of cooperation is important, and perhaps Japan needs to encourage the idea of doing research elsewhere, and of being accepting of collaborations, because it is true that Japan today is not very open in its collaborations. We are trying, and we have a science and technology agreement, and many things are on the way. I hope that a sister ARA comes into force very soon. We would like to collaborate.

Moderator:

Thank you very much. This concludes the panel discussion. I'd like to express my appreciation to all of the panelists. Thank you.