

# Panel Discussion and Wrap Up

**Atsushi Sunami**

Associate Professor and Director of the Science & Technology Policy Program, National Graduate Institute for Policy Studies (GRIPS)

The main overall task is to put together the outcomes of all of the sessions we have participated in to create a unified resolution. First, the representatives from each session will present the results of their discussions. Let us start with Session Five on Measuring Innovation.

**Masahiro Kuroda**

There are many types of innovation, and different disciplines take very different approaches to the topic. A common language is needed to express and discuss the topic of innovation. Topics discussed in Session 5 included evaluation of service output, intangible assets, including transfer of intellectual property, measurement of total factor productivity, measuring the potentiality of future innovation, and an innovation index used in the EU. The group also stated that it would like to have a workshop or conference on measurement of innovation.

**A. Sunami**

Is there was any difficulty in developing a common language for discussion for use among economies at different stages of development?

**M. Kuroda**

Yes, there are discontinuities in innovation, especially with regard to future projection. This will be a point of consideration going forward.

**Junichiro Fujino**

I agree that measurement of innovation is important from a policy and budget perspective, but it has to be clear what phase of innovation is being discussed, research, demonstration, development, or deployment. Excessively strict evaluation of researchers could make it difficult to achieve new innovation.

**M. Kuroda**

It is true that measurement of innovation cannot be uniform. I hope it will be possible to condense innovation and introduce some of the implications for policy.

**Richard B. Dasher**

I agree with Mr. Fujino that evaluating use of tax money is an important issue. Also interesting is the question of different stages of innovation and how they contribute to innovation. What is critical is some sort of meta-language.

**Yuko Harayama**

The GIES focuses on the science base and sustainable development, which looks at the economic, social and environment with indicator focus on social impact development and environment.

A. Sunami

I agree. I would like to draw attention to the presentation on service sector innovation and the importance of the demand side on determining what is innovative. It is in the spirit of the GIES to bring not just the innovator side, but also the demand side, as this presentation described.

**N. Nishizawa**

I will introduce Session 4 on behalf of Prof. Hayashi. The session topic was Sustainable Supply of the Consumer-Satisfied Safe and High-Value Added Food, and there were five presentations: "Breeding Crops for Better Nutrition," "Mineral Nutrient Transporters: Their Potentials for Crop Improvement," "Molecular Breeding for Doubly Green Revolution: The Jasmine Rice Model," "Molecular Breeding for Enhancing Tolerance to Low Iron Availability in Calcareous Soil," and "Agricultural Problems of Pakistan."

The discussion concluded that high value-added food targets not only people in advanced countries but also in the developing countries, and that the following R&D should be promoted: breeding micronutrient dense staple crops pro-vitamin A, iron, zinc and boron, nutrient stress tolerant plants to improve its growth and fertility against global warming, technology-integrated sciences for clinical crops projects. Effective support from industry and finance are also needed, as are international joint research projects integrating agriculture and engineering.

**A. Sunami**

NGOs are often filling the gaps financially in the R&D and research expenditure system.

**R. Dasher**

Is there was a dialogue about the benefits of molecular breeding versus genetic modification (GMO)? To what extent does GIES needed to consider intellectual property issues regarding these new plant varieties, recommending a multi-sector government and industry forum under an international umbrella?

**N. Nishizawa**

That is a difficult question, but both approaches have merit.

**R. Dasher**

Public acceptance is the real challenge.

**N. Nishizawa**

We have designed non pollinating plants to help reassure the public that GMO crops will not spread uncontrolled. At the moment, there is no international umbrella for discussing public acceptance and innovation-friendly patent policies in this field.

**J. Fujino**

In Japan, genetically modified food is already widespread, and eaten on a passive basis, without consumers realizing.

**Thomas B. Johansson**

Professor, the International Institute for Industrial Environmental Economics at Lund University, Sweden

How helpful can IPR be in this field, which exercises so much influence over people's lives and quality of life?

**R. Dasher**

I am not necessarily pro-patent, but that the issue needs to be discussed in order to work out an arrangement for the public good.

**Howarth E. Bouis**

Director, HarvestPlus, International Food Policy Research Institute

HarvestPlus is developing both conventionally bred crops and transgenic crops, but mostly conventionally bred crops, because transgenic ones were likely to be discarded and go to waste due to public acceptance issues. Conventionally bred crops released by HarvestPlus are public goods because they can be replanted year after year after their release.

**Apichart Vanavichit**

Director, Rice Gene Discovery and Rice Science Center, Kasetsart University, Thailand

There is already enough genetic diversity in rice not to need to make genetic modifications. IPR is likely to become a burden rather than a boon in this situation.

**A. Sunami**

IPR should be the subject of debate in the GIES. It was the producers, the actual farmers, who are important actors in the picture. At the Swaminathan Institute in India, there is a model village with farmers actually trying out the crops being developed, an interactive model with many potential benefits.

**Shinichiro Ohgaki**

Professor, Department of Urban Engineering, School of Engineering, the University of Tokyo

Session 3, on the topic of safe water supply, concluded that, while resolving the global problems that we are facing, it will be necessary to promote activities for sustainable development or sustainability development. The session confirmed the importance of water and its relevance to every sector and society, and proposed a demonstration project under the international collaboration of the GIES demonstrating the integration of water-related science and technologies; implementation of integrated water resources management with perspectives of industrial, agricultural and domestic water sectors in cooperation with private sectors, taking into consideration affordability, applicability and climate change; capacity development for global, regional, national and local water securities; and development of scientific-based decision support systems on water and global environmental management policies.

“Decision support systems” means offering governments and decision-makers solid scientific support to back their choices in the water sector.

**R. Dasher**

Often jurisdictions around a single watershed do not cooperate and coordinate. I agree that GIES was the right kind of approach to address the problem, but it will be very difficult.

**S. Ohgaki**

What we proposed in Session 3 was only a support system, not actual decision-making.

**R. Dasher**

Even so, significant political support will be needed in order to allow GIES to make suggestions to decision-makers.

**T. Johansson**

Water availability will be a much more difficult question in the not too distant future. What would an adequate response be?

**S. Ohgaki**

IPCC is doing current analysis, so GIES can make a platform to add new innovations and technologies or look for new technologies for the purpose of water security.

**Monthip S. Tabucanon**

Director General, Department of Environmental Quality Motion, Ministry Of Natural Resources and Environment , Thailand

Water issues could be raised at the international level, such as the United Nations Commission of Sustainable Development (UNCSD). Thailand has national and local level organizations and working groups on water. Water is a public utility not owned by anyone, so there is a challenge to come up with a demonstration project and North-North South-South technological cooperation.

**Masataka Watanabe**

In Asia, a simple supply-demand analysis does not satisfy the needs of the society. Therefore the eco-system approach should be extended to water issues.

**Yuko Harayama**

There is already an existing framework to discuss the international point of view, but conceptually, it would be nice to use GIES as a platform to resolve the problem. However, to make concrete actions, funding must be secured. Was this discussed?

**S. Ohgaki**

We have not yet reached that stage of the discussion.

**A. Sunami**

When demonstration projects are actually being designed, they should link local and global activities, which currently have a disconnect.

**M. Watanabe**

Professor, Faculty of Environment and Information Studies, Keio University

The linkages are not clear; GIES proposes a scope for linking these global issues to local problems.

**Eiichi Yamaguchi**

Deputy Director of Institute for Technology, Enterprise and Competitiveness (ITEC), Doshisha University

Session 2, Low Environmental Impact Transportation System, discussed three key technologies: liquid nitrogen cars or compressed air car which never consume oil, completely different from the current automobile paradigm, are possible. There can even be automobiles that purify the atmosphere by hybridizing this liquid air car system with the electric car system. Next, automobiles run by lithium ion batteries are highly feasible, but creativity is needed, and currently in Japan engineers cannot be so creative. Third, it is quite feasible to make electric cars which can run for 400 km by just one charge, dramatically reducing the electric power consumption in the cars.

In addition to these automotive technologies, vehicle-to-vehicle communication systems are a key technology for realizing a ubiquitous society with a wireless neural network system. Also, to realize a well-mobilized society, it is necessary to encourage urban design innovation in order to smooth the traffic flow as well as the quality of life of the residents. The session resolved on the need to discuss the Low Environmental Impact Transportation Systems (LEITS) because of that removing the CO2 emissions and oil will be vanished within at the latest 20 years.

**R. Dasher**

For GIES to be effective, it must not become a platform for people to bring their existing solutions and market them. One of the issues that has to be discussed in regard to low-impact transportation systems is how the capital costs will be paid, as it is significantly more expensive to use hybrid technology, for example. Engaging other points of view that have to do with kind of economic concerns or consumer concerns is not going to be critical for GIES to proceed.

**Eiichi Yamaguchi**

I agree that international alliances are needed.

**R. Dasher**

In addition, it is necessary for all stakeholders to feel that they are contributing to developing the solution.

**Hisashi Ishitani**

Was there any discussion about reconsidering the city structure to reduce the overall traffic? What about raw materials, especially for motors and batteries?

**E. Yamaguchi**

We discussed city structures, but not raw materials.

**T. Johansson**

It is not simply lack of technology that keeps innovations in electric cars from happening, but political and social factors as well. We must go beyond technology to policy.

**E. Yamaguchi**

The session did not have time to discuss these socioeconomic issues, but next time they should be discussed.

**J. Fujino**

What is the true value of mobility? Does the ability to move around truly outweigh the costs incurred by traffic accidents?

**E. Yamaguchi**

Elimination of traffic accidents is important, and maturity of societies plays a role in reducing accidents.

**A. Sunami**

Perhaps there could be a discussion on experimental economics to see how much behavior would be affected in terms of the city design and regulations, and then discuss about the alternative radical technology.

**H. Ishitani**

Session 1: Effective Use of Natural Renewable Energy featured five presentations: "An Overview of Renewable Energy Program in Europe," "Present Status and Future Prospects for Photovoltaics towards 2050," "Photovoltaic Activities in Thailand," "Sustainable Biomass Utilization Scenarios and in Asian Biomass Strategy" and "Hydrogen Production from Water with Solar Energy." It takes a long time for the energy system to change, so it is necessary think about the current status of technology as well as long-term innovation. Photovoltaic technology exists, and is being used in Europe, but in Japan subsidies were stopped, and diffusion has halted as well. Photovoltaics are expensive, but is this framework correct? We need to promote or accelerate the transition to sustainable electricity. There needs to be taxation of externality about CO2 emissions. At the same time, it is important to involve developed countries to prevent unfair competition.

The session proposed an international task force for discussing technology systems. However, this task force must take into account regional differences for renewable energy, especially biomass or photovoltaics, which are quite different according to the temperature or weather or climate. Another proposal was to establish a Japanese natural renewable energy laboratory for establishing a research alliance integration mechanism with a view to focus investment and development and so on. Finally, the session proposed the designation of eco-cities in each country's unique local cultures and lifestyles, and operation of a network of such cities.

**T. Johansson**

There is a value created if you reduce externalities, for example emissions of greenhouse gases. If these are not reflected in the marketplace, the marketplace will not pick them up. It must be done through public decision-making systems. Europe has shown that it is possible to create instruments that deliver quickly. The most effective and efficient ones are the feed-in tariffs, that is you pay generously for renewable electricity and renewables and then it actually happens and it happens fast. This is the point where it has to go from discussion to actually come to action, and the action must be taken by the public sector, even against private opposition.

**J. Fujino**

The situation is different from country to country. Feed-in tariffs have been less successful in Norway than in Germany,

because the tariffs were too low, so the situation differed. In some developing countries, there is no electricity grid at all for a substantial proportion of the population.

#### **Y. Harayama**

Innovation is concerned not only with technological progress, but also technological transfer and diffusion process.

Technology could be diffused by training for women, using those who are in need of electricity in rural areas. This could also become a business and help contribute to economic development.

#### **H. Ishitani**

Such a program would be cost effective, as there has been talk of a niche market for renewable energy in rural areas because of the enormous cost of connecting to central distribution systems.

#### **M. Watanabe**

Innovation related to technology has to have a strong link with political understanding. The findings of the GIES should be submitted to the Ministry of Environment of Japan to put on the table at the Eco-Asian Ministerial Meeting to make all the ministers from Asia and the Pacific fully aware of the innovation.

#### **A. Sunami**

There is clearly demand for the GIES concept. There will probably be another GIES meeting in the coming year, with topics to be decided, but possibly including public goods and IPR. There has been much talk of science feeding into policy-based decisions. There have been suggestions of demonstration programs, and possibly a model eco-city. For this to happen, there will need to be a research hub, whether in Japan or elsewhere.

#### **J. Fujino**

Can someone give a concrete definition of “ecosystem?”

#### **A. Sunami**

There is a team working on the concept of GIES. Many things are taking place globally of which we are not yet aware, and the idea here was to be general and broad enough to accommodate the many realities. A concrete definition of ecosystem might alienate some.

#### **R. Dasher**

GIES is different from other organizations, and should be. GIES should encourage people to see beyond the horizon, for scientists to think about policy implications, and people in implementation to look at North-South issues, and for the producers to understand consumers better. GIES should bring together points of view that do not usually synergize with each other, and avoid duplicating efforts. To this end it is necessary not only to think about topics, but also the people thinking about the topics. GIES must seek out the disconnects and take actions that others are not taking, staying focused on a global perspective with a view into ecosystems that academic conferences and think tanks do not provide.

#### **M. Tabucanon**

The next Expo in Shanghai will be titled “Better City, Better Life,” inviting cities all over the world to display how they come up with the eco-city concept. If GIES would like to handle the network of the eco-city it would be good to propose the concept to the Minister of Eco-Asia to endorse the GIES concept, so that GIES will select the city that they would like to work as a demonstration site. This would create a partnership between the government and GIES.

## **Closing**

#### **Tateo Arimoto**

Director-General, Research Institute of Science and Technology for Society (RISTEX), Japan Science and Technology Agency (JST)

We now invite general remarks from the floor.

#### **C. Evans**

I would like to thank the host committee. Innovation should be the lens through which all of our work should be focused. In addition to these workshops, there are other innovative ways to stay engaged throughout the year, through websites, blogging, and so on, and there is an opportunity to create a much closer community. The Council on Competitiveness agrees to commit to ongoing discussion.

#### **Kimikazu Iwase**

I have been impressed by the technology and science presented by the speakers, but also by their visions for action. I have high expectations for the future of the GIES.

#### **Toshiaki Ikoma**

Thank you to all the participants and speakers for your opinions.

The GIES concept originally began as a national innovation ecosystem for Japan, much like the Council on Competitiveness in the United States. We then realized that we could not distinguish between national and global innovation, and that innovation holds the keys for achieving the targets of Cool Earth 50. We then selected topics such as food and water, trying to avoid confusion and reduplication of existing international frameworks. Distinguishing GIES from these other organizations will help us to keep a clear view of our mission.

We would welcome another country to take over from Japan as the host country, but in the meantime Japan would like to continue the discussions in small groups in order to generate concrete proposals.

#### **T. Arimoto**

Thank you. Today’s conference is now over, and we can expand this movement to a global scale.