

# Final Session



## Moderator

### **Toshiaki Ikoma**

Chair, GIES2007 Organizing Committee  
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## Speakers

### **Masaru Yarime**

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### **Yuko Harayama**

Professor, the Management of Science and Technology  
Department, the Graduate School of Engineering of  
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### **Eiichi Yamaguchi**

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

### **Masahiro Kuroda**

President, Economic and Social Research Institute,  
Cabinet Office, Government of Japan

## Summary

### **Toshiaki Ikoma:**

Open discussion

### **Eiichi Yamaguchi:**

In Session 3, we discussed the feasibility of a global

alliance to remove air pollution from East Asia. We  
had a very deep, provocative, political discussion. Our  
tentative conclusions, however, are bit trivial. The first is  
to set up a goal for removing the world's air pollution,  
including SOx and NOx as well as particulate matter and  
enhance the value of air resources by 20-times. We need  
to coordinate goals between Japan and China. There is  
a problem between the relationship between incentives  
and risks. There are risks for both countries. Our second  
conclusion is to create a sustainable alliance against air  
pollution between Japan and China and have it serve as an  
example for the world. It should be about one generation  
or 50 years. Third, Under this alliance, we should build an  
international innovation engine to deal with air pollution  
issues. Fourth, we need a sustainable system to make  
long-term evaluations of these action plans.

### **Toshiaki Ikoma:**

This is very concrete and should be treated by the GIES as  
a good example.

### **Masahiro Kuroda:**

I will summarize the results of Session 4. Our session  
was a sort of technical session on how to measure  
the outcomes of innovation. Internationally, the

measurement of the outcome of innovation is very much under discussion in OECD, United Nations and other organizations. Measurement of innovation is part of the system of national accounts, and both tangible and intangible assets must be evaluated. Our session title was "Establishing a Benchmark for the Global Innovation Ecosystem." The question is what the measure is for the outcome of innovation and how to evaluate the effect of policy instruments. Unfortunately, the discussion had a very difficult time moving to the last topic, the policy instrument issue. We focused on the measurement itself. There are two sides to the outcome of innovation: the demand side and the supply side. On the demand or welfare side, innovation itself might have impact on the value of the commodity. How to measure this impact on society is one of the big issues. On the supply side, we examine the impact of innovation on productivity and the supply for individual industries and commodities. There are still big problems in evaluating social values as welfare measures, but economics has some tools that might be useful in this context. Everything is linked and ultimately impacted: the price side, income side, and so on. In the future we need to give further consideration into how to measure such impact on the society through the general equilibrium framework. The second issue is the measurement of productivity. In the morning, we heard about the new economy, where we have to evaluate productivity changes by innovation or technical progress. The last decade or two, productivity changes occurred rapidly because of innovation in every country, but especially the United States. By contrast, Europe and Japan did not see such a large impact from productivity changes compared to the size of their investments. One of the reasons comes from the delay of productivity growth in Japan and Europe—productivity in the IT-using sectors, not IT-producing sectors. Productivity in IT-producing sectors was encouraged by innovation and technical progress, but unfortunately, the productivity growth of the IT-using sector—including service like retail trade, wholesale trade,

finance and insurance—experienced delays in productivity growth. That was the second conclusion we reached. The third one concerned the measurement of intangible assets. Investment has a large impact on productivity growth in industry, but intangible assets are also very important to promote innovation. Intangible assets include the amount of software, R&D and economic competencies, including organizations and human resources. How to measure such intangible assets? That has received a lot of discussion within the system of the framework of national accounts. We heard about the discussion of the OECD on measurement of intangible assets, but there are still many issues to be addressed. International comparisons are also difficult because there are no international standards for measurement. We also discussed about the innovation through the different stages of the economic development in Japan. Innovation might have a different role in different stages. We talked about how the structure of the economy and R&D investment are related. We were unable to reach a result, but at this moment we recommend the establishment of an international network to discuss these problems, and hopefully expect to make a network for discussion among countries including the developing countries under the movement of the globalization. The impact of innovation will be felt by the global economy as well as national economies.

**Yuko Harayama:**

Session 2 concerned human resources. GIES without human resources is nothing. This is a very important topic, but we are unable to finalize recommendations. Within the context of globalization, our session was most interested in people. There are preconditions for the movement of people. There is some openness, but also regulation and restriction. How do we overcome this? We usually talk about things in a bilateral context, but our discussion was focused more on multilateral movements of people, multidirectional movements of people. We are more and more interdependent. What are people? They are a source of knowledge creation and

also absorbers of the body of knowledge. They are vectors of knowledge transfer and also guardians of knowledge systems. There may be some interaction, some organized and some spontaneous. Then maybe some channeling reactions or some true serendipity. We may create some “ba” like we proposed this morning. They may be driving forces behind this. What is the rationale for the individual to do this? What is important is to have valuable global experiences in your career. You need to have global skills development. There are also market forces at work because we are competing for skills and resources, including human resources. We are also competing for training. But there is room for cooperation. We discussed political processes and different policy domains. Sometimes they support more dynamics, sometimes more restrictions. There are several technological changes supporting this. For example, ICT technology and transport systems facilitate movement from one point to another. Even virtually, you may exchange ideas. Given that, our discussion focused on higher education and university systems. What is higher education? Teaching and training activities are becoming globalized. We are searching for students, faculty members and administrators on a global market. To make a global market work, we need to have cooperation and competition at the same time. But along with this, we need to overcome these two contradictory forces. We discussed how to create entrepreneurial universities and the need to guarantee some standard of quality. Where do we go from here? We have more accessibility to knowledge and human resources, which is creating a global competition. There may be homogeneity within the directions that we are going. There is the US model that people try to emulate. But there may be diversified models as well and for that the European experience is very important. We may also create new models from the Asian point of view. One of our conclusions was that we have to work in partnership. Our first resolution was to have more emphasis on transforming education systems. We are based on global competition, but we must find some way to have cooperation and

more specifically we want to exploit new cross-cultural programs. We propose to be more practical on topics like how to solve specific global problems, doing research in foreign countries, and creating entrepreneurial universities. A second point is creating framework research projects instituted on the basis of international cooperation. On this point, we need to expand funding for international research collaboration. These are basic things, but we must continue to do them. The third and most important is to support career plans for researchers. It is important to have broad experience, but for example, Japanese researchers once they have established themselves in the US, have a difficult time coming back to Japan unless they have maintained ties with their professors. There must be a way to come back. Most importantly, we need to create networks. We said for this topic, the EU has some experience but if you look at Eastern Asia and India, we have to construct a network right now. This conference could be the first step to do that. We will need to experiment and try things. We must also provide incentive for the mobility of human resources and technology. We should not just capture them for own sakes, but share some parts and compete to get more dynamics for the full system. On the role of Japanese government and industry, of course we need financing structures and we need support from the government, the universities and industry in order to achieve such a system.

**Masaru Yarime:**

Session 1 was about how to establish and utilize information and knowledge infrastructure for collaboration and innovation. The basic background is that we observe the increased intensity of scientific data and information and the increased diversification of the knowledge base required for innovation. At the same time, we have seen the intensification of intellectual property rights regimes and the expansion of private spheres of data and knowledge. We need to consider the characteristics of data and information in comparison to the characteristics of physical input, that is, public goods characters including non-rivalry and non-excludability, cumulativeness, additivity,

and expandability. The purpose of this workshop was to provide an international and interdisciplinary forum to understand the economic, technical, legal and institutional frameworks for establishing and maintaining information and knowledge infrastructure and to discuss how to utilize it for simulating collaboration in a way that contributes to sustainability. We discussed economic, organizational and legal aspects, but at the same time we also examined the technical aspects with the presentations of the actual cases of open source software and the Scientists without Borders initiative which is working on poverty reduction in Africa. We could not agree on explicit resolutions for concrete action, but we would like to emphasize that it is very important to keep an appropriate balance between open and private spheres of information and knowledge. An information commons is emerging in different fields such as molecular biology, open-source software, and public health. And also the Scientists without Borders initiative is effectively an information commons for sharing data and knowledge for reducing poverty and improving public health in Africa. We need to identify and closely as well as critically examine the characteristics of information commons in different areas and fields. For example, we could identify characteristics like fragmentation of knowledge, speed of information and knowledge creation, and scope and opportunities for combination of information and knowledge. These are among the factors which could influence the conditions for establishing and maintaining information commons. I think that we need to establish sectoral systems for information commons. Different sectors have different conditions and circumstances, and it is necessary to have delicate understanding of them. I think we need to tailor policies depending upon these different conditions. This is a very important issue for discussion in the next conference.

**Toshiaki Ikoma:**

We will publish the proceedings of this workshop and I assume you have been contacted asking you to write something. When we receive your answers, we will

judge whether it is publishable or not. We also have made recordings and taken minutes, and will have very complete records of the conversations. If they are worthy of publishing, we will try to publish them. There is a publisher in mind. This is not definitive, but if we try to publish the proceedings, we will contact you and secure agreement. Second, we want to start preparations for the next conference on the occasion of the G-8. For that purpose, Japan will be forming a team to set up some more concrete topics and platforms for GIES study: how to construct GIES, how to collaborate with other countries, how to start networks. We may contact you on those aspects.