

Towards a Mature and Sustainable Society
International Symposium on Sustainability Science
7 January 2013
United Nations University

Introduction

As the title of the symposium suggests, the aim of this symposium was to explore ways in which industry and academia could work together to promote sustainable and mature societies. The notion of a mature society goes beyond the idea of an ageing population and the economic and social implications of that demographic fact to include the idea of a society that has reached a peak in economic growth, has achieved robust democratic institutions, and is concerned about the well-being and quality of life of all its citizens, including seniors and the disadvantaged.¹ Today, Japan leads the OECD countries in the rate of ageing (more than 40% of its population is expected to be over 65 years of age by 2050 – up from less than 20percent of its population in 2005). However, other advanced developed countries are not far behind and will soon face the same challenges. At the same time, these countries also must grapple with the deeply complex issues that threaten sustainability not only in their own societies but globally as well. In other words, how Japan deals with these twin challenges may serve as a beacon or warning to others in the years and decades to come. One thing is clear: however these issues are met, government alone cannot solve them. Industry is going to play a significant role and in that context, the symposium wisely brought industry, government and academia together to consider jointly their individual and collective roles.

In light of these concerns the nation-wide Sustainability Science Consortium (SSC) joined forces with programs in sustainability at The University of Tokyo and the United Nations University to sponsor this international symposium and open it to the public in Tokyo. ² The tone of the symposium was set in a special lecture and keynote address by renowned international economist Sir Partha Dasgupta, who is

¹ For background on the concept of the “Mature Society”, see the work of Dennis Gabor, Nobel Prize in Physics, 1971 and in particular his work in social analysis, “The Mature Society: a view of the future” (1972)

² Symposium sponsors included the Sustainability Science Consortium (SSC), which is funded by Strategic Funds for the Promotion of Science and Technology of the Ministry of Education, Culture, Sports, Science and Technology-Japan (MEXT). This is a general incorporated association of research universities, institutes, businesses and municipalities whose aim is to raise awareness of sustainability science in Japan. Also supporting the symposium were The United Nations University, and The University of Tokyo’s Integrated Research Systems for Sustainability Science (IR3S), the Graduate Program in Sustainability Science – Global Leadership Initiative(GPSS-GLI), the Asian Program for Initiation of Environmental Leaders (APIEL), and the Graduate School of Frontier Science (GSFS).

one of the world's leading critics of the use of GDP to measure a nation's real economic wealth. He is the developer of an inclusive wealth index that has been put to the test by the United Nations International Human Dimensions Programme on Global Environmental Change (IHDP) and which was also considered by symposium participants.

Wide-ranging in its coverage of sustainability and issues concerning the "mature society" the symposium resulted in the following recommendations for universities in the **symposium declaration**:

The time has come for universities to:

- Replace common measures of progress (GDP and HDI) with the more robust means (such as IWI) that include natural capital and human health and that take account of inevitable trade-offs and substitutions
- Support a radical shift in defining progress and growth from simple economic quantitative measures to a basket of measures including more comprehensive quantitative indicators such as the Inclusive wealth index but also qualitative measures that provide measures of subjective wellbeing of individuals and communities.
- Recognize that change in attitudes, behavior and practice in all sectors is necessary and take steps to manage such change on individual and institutional levels
- Promote, support and sustain long-term industry/university collaborations
 - Encourage industry to be involved in curriculum development
 - Conduct joint research, especially long-term research, which is more beneficial to industry as well as to society in the long-run.
- Expand communication and outreach on sustainability science to promote understanding of its holistic approach in industry, government, and the public
 - Disseminate results of collaborations
 - Promote community awareness of sustainability science
- Engage with industry, government leaders and local communities – actively including seniors - to create networks for the development and promotion of sustainable societies. such as the symposium sponsor, the Consortium on Sustainability Science, and the "Platinum Society Network")

The following sections of this overview present brief summaries of the presentations and discussions, which led to the attached Symposium Declaration.

Welcome address

Dr. **Hiroshi Komiyama**, Chairman of the Mitsubishi Research Institute, Inc. and President emeritus of The University of Tokyo opened the Symposium. In his groundbreaking book, "Vision 2050", Professor Komiyama laid out a plan to reach global sustainability through the combination of comprehensive material recycling,

a three-fold increase in energy efficiency, and a doubling of renewable energy. (Komiya and Kraines, 2008) In his welcome address, he focused on the leadership role that Japan can play to inspire the transformations that are necessary for societies to overcome unsustainable practices and become what he calls, "Platinum Societies". These are societies that are ecologically sound, self-sustaining in terms of energy and materials, and that contribute to the material, physical, and spiritual well-being of its citizens, including its seniors. It is an optimistic vision for the future, but one that Professor Komiya illustrated is not only possible, but probable given Japan's history of overcoming past environmental and energy crises combined with the necessity to reduce significantly fossil fuel consumption and current technological trajectories and demand for innovation that will help businesses and individuals to dramatically reduce consumption without sacrificing quality of life. This "revitalization" of Japan will require commitment not only from government in the form of new regulations and investment, but also from the private sector and civil society, with all elements working together. In other words, it will require a large-scale social movement. This is underway in Japan today both through the consortium on sustainability science, which is helping to promote the application of sustainability science (the integration and structuring of knowledge for sustainability) to meet the needs and attain the sustainability goals of a mature society as well as through the Platinum Society Network, which Professor Komiya chairs. Today, 110 local governments, 72 private companies and 39 individuals are active in this network. The aim of the network is to promote the revitalization of Japan as a model for global sustainability through three main means:

1. good practices that promote energy conservation and material recycling with support from local authorities as well as through university/industry partnerships that will help to identify solution options
2. using advanced information technologies to structure knowledge for holistic understanding of problems and ways to address them coupled with wide dissemination of the lessons learned from good practices, and
3. government support in the form of robust institutions, laws and regulations that advance the goals of a mature and sustainable society, as well as initial investments where needed to promote well-being among all the citizens

Keynote address

The keynote address was delivered by **Sir Partha Dasgupta**, the acclaimed economist and Frank Ramsey Professor Emeritus of Economics at the University of Cambridge, England who is the intellectual force behind the development of an "inclusive wealth index" to measure the true wealth of nations beyond the conventional measure of economic progress, gross domestic product (GDP). GDP is the market value of all goods and services produced within a country during a certain period of time. Clearly this limited definition leaves out what Dasgupta

believes may be the most crucial components of true wealth including environmental resources, education, and human health and welfare. But until very recently despite its many limitations nothing has replaced GDP in measuring nations' economic progress. Even the Human Development Index (HDI), which added literacy and mortality rates to the equation of national wealth, could not fully indicate whether or not a country's policies were improving the well being of its citizens. Today, thanks to Professor Dasgupta there is an alternative way to gauge a country's economic progress. Taking account of the missing elements, particularly measuring the state of the environment in a given country can result in far different results than those revealed by GDP. Rapid GDP growth, he has shown for instance, often reveals a lack of sustainability.

In the address, Prof. Dasgupta noted that in contrast to the Brundtland Report definition of sustainable development, he and his colleagues adopt the view that by sustainable development we should mean that well being across the generations does not decline over time. GDP analyses cannot do this. However, a numerical index of an economy's capital assets that over time faithfully tracks movements in intergenerational well-being could be used in sustainability analysis.

In order to determine if intergenerational wealth increases over time (that is sustainable development) the productive base of an economy (whether national, personal, regional or global) is tracked. The productive base of the economy, according to Dasgupta, is made up of three kinds of capital: produced capital (e.g. roads, bridges, machinery and equipment); human capital (that is population, knowledge and skills, and importantly, health; as well as natural capital such as the health of eco-systems, which is something that is rarely taken into account in economic assessments. Dasgupta believes that our ignorance of the economic worth of natural capital remains the greatest barrier to an understanding of the history of economic development. As indicated in the formal paper accompanying his talk, "Until that ignorance is lifted policy analysis will remain crippled and sustainability will continue to be a notion we admire but cannot put into operation." (Dasgupta, 2012) He believes that in the future the formal wealth of nations is going to be measured less in economic wealth and more in terms of natural capital and human health.³ As noted in his presentation, wealth is the social value of an economy's stock of capital assets, comprising. produced capital (e.g. roads, bridges, machinery and equipment); human capital (i.e. the size and composition of population, education and health); and natural capital (e.g. ecosystems, subsoil resources). These comprise the productive base of an economy. There are other assets of course that Dasgupta calls enabling assets. These extend to institutions knowledge, culture, religion and even norms and practices which comprise the "social infrastructure" of an economy. These are important both as lubricants, if you will, of

³ For the paper on his talk at the symposium, see Dasgupta, 2012. See also Arrow, Dasgupta, et.al., 2012 a and b).

the capital assets, and for the role they play in helping to determine the “shadow prices” or social value of the capital assets. In Dasgupta’s view sustainability research for the next 25 years will be focused on estimating the shadow price of capital assets. To carry out these estimations, three types of information are required:

1. A descriptive model of the economy
2. The size and distribution of the economy’s capital assets, and
3. A conception of social well-being

Professor Dasgupta concluded his presentation on the development of an inclusive wealth index with an example of assessing the sustainability of Indian economic development over a five-year period which demonstrated that the country did experience growth in wealth per capita during that time, and that the dominant factor in that growth could be attributed to health.

Speakers

The formal opening of the symposium and keynote address set the tone for the symposium, which focused then on ways in which universities and industry working together could contribute to the attainment of social well being envisioned by the previous speakers. Seven invited speakers from government, industry and academia presented their views on the role that these institutions can play in attaining a mature and sustainable society.

Dr. Anantha Duraiappah, Executive Director of the International Human Dimensions Programme on Global Environmental Change (UNU-IHDP) presented the results of the first Inclusive Wealth Report carried out by the UNU-IHDP to measure the sustainability of countries. (UNEP and UNU-IHDP, 2012) As recommended by Professor Dasgupta, who acted as Science Advisor to the project, the report considers the productive base of economies over a sufficient period of time (19 years, from 1990 – 2008) in 20 carefully selected countries representing 72% of global GDP and 56% of the world’s population. The study represents the first time such an ambitious analysis of progress towards sustainability has been made. According to Duraiappah it is a significant step in moving away from looking at flows of income to measure a nation’s social progress to measuring progress in terms of the total stock of wealth. This initial study will be repeated every two years. The framework for the analysis, based on capital assets to assess the productive base, according to Dr. Duraiappah, provides a tangible measure for governments to use and track over time. And even more importantly, he noted, it provides critical information for policy-makers on which forms of capital investment should be made for ensuring the sustainability of the productive base of a society. For example, the study revealed that while all but one of the countries (Russia) was on a relatively sustainable track each had areas where investments in particular areas would

improve the welfare of its people. In Japan, which does show increasing natural capital and inclusive wealth the report led to recommendations to increase total factor productivity, increase investment in natural capital, and review the increase in capital investments.

Duraiappah emphasized that the report is an important first step in transforming the global economic paradigm and provides a valuable framework for tracking sustainability. It is, he noted, incomplete and illustrative, highlighting areas where more work is needed to plug existing data gaps. Four critical points to grapple with, he noted, in making new estimates of progress include:⁴

1. measure progress in terms of well-being
2. actions must be sustainable
3. equity and equitable distribution are becoming critical issues to consider as increasing and widening inequality has an important impact on natural systems, and
4. measurements of progress must take account of and reflect trade-offs and substitutions in the economic and social systems.

Kiyoshi Kurokawa, MD pointed to the central role that the internet and related increased connectivity has played in the rapid transformations that have occurred throughout the world in recent years from the collapse of the Soviet Union to the election of Barack Obama to President of the United States, to the Arab Spring, and many other events that would have been unthinkable a decade ago. Such connectivity and change in the world increased particularly in the 1990s with the advent of the World Wide Web and lap top computers. And it is Dr. Kurokawa's contention that the global conversation on concerns about the sustainability of the planet that began in 1992 in Rio de Janeiro and has expanded significantly since then would have been unthinkable before the end of the cold war. "How could the world's attention turn to these issues when the conversation until then was all about nuclear war?" he asked. Tracing remarkable change over the last 10 years especially, Dr. Kurokawa noted that this progress was unlikely to abate but, rather, will accelerate and open further boundaries that now define the world we live in and lead to more open dialogue on the issues we face in moving toward sustainability. As an example, he cited the Independent Commission on the Fukushima Nuclear Accident in Japan, which he chaired. Such an independent and open commission would not have been possible a decade ago. But with the opening of greater access to information and decision-making, we also enter an age of greater uncertainty. Greater and even vast amounts of knowledge do not necessarily mean we are wiser in the use and application of that knowledge. What we have learned in moving forward, he noted are a set of principles that are changing the way we think. For example, thinking in terms of "resilience" rather

⁴ For a more complete account of concerns, see Duraiappah and Munoz 2012

than strength, in terms of risk, rather than safety, and in terms of systems rather than objects or things. He emphasized the importance of having a vision, just as the previous speakers also called for a vision of the future, a conception of well-being. And in order to achieve it, Kurokawa challenged participants to think of pull instead of push, of practice rather than theory. In the future, he said we might also value disobedience over compliance crowds instead of experts, learning instead of education.

In concrete terms, **Dan Olsson**, CEO of Stena, AB, Sweden, provided participants with a vision of how companies can become bigger contributors to the inclusive wealth of sustainable societies in his talk on “Courage for Sustainable Industrial Innovations”. Citing the crucial factor of culture in terms of corporate practice, Mr. Olsson described the “Stena Care initiative, which is central to and drives the family company’s business in shipping, recycling, and energy. Care in the Stena context, he said, means that we contribute to creating multiple success not only, obviously, in terms of business success but also to the success of our partners, employees, customers and society. In each case, the company has developed measurable goals and key performance indicators. For example, with respect to its contribution of societal success, Stena includes sustainability, job creation, education, harmony and continuance (longevity of the company). And for each of these, there are measurable performance indicators, such as number of employees, environmental impact, the amount of recycled and reused materials, etc. The company continues to improve its environmental performance by setting a goal of 2.5% energy savings per year, sometimes in surprising ways. For example, they found that increasing the size of ships is very fuel-efficient. Today Stena ships are 26% better in energy efficiency than their best performers in the nineties and six percent better than any other contemporary ship. Looking ahead and taking the longer view than is typical for corporations, the company has invested in entering the wind energy field in light of what they believe will be a power supply shortage in Europe.

Mr. Olsson also described the Stena recycling program, which covers not only iron and metals but also paper, hazardous waste and electronics at around 250 locations in Europe. The recycling initiative eliminates about eight million tons of CO₂ emissions per year. Beyond this, however, Olsson believes thirty to forty percent of all waste could be converted for energy use. Thus the company is now a global player in recycling waste in collection, transportation, separation and processing. They continually work on neutralizing toxic materials and by separation techniques diminish the need for new mining and other extradition of materials. One goal of the company is to “mine” landfills to extract metals and plastic materials that are now considered waste. The company has also invested in vacuum waste collection systems.

The courage to innovate drives the company to become more sustainable itself and to contribute to a sustainable society. And, as Olsson indicated one of the ways in which the company maintains its capacity for innovation is to partner with universities. Stena created a professorship in industrial recycling at Chalmers

University, Sweden and supports 11 postgraduates as well as working with other universities in Sweden and internationally such as the Alliance for Global Sustainability (AGS) and The University of Tokyo's IR3S initiative.

Jan Eric Sundgren has held leadership positions in both academia and industry as the President of Chalmers University of Technology and today the Executive Vice President for public and environmental affairs at AB Volvo, Sweden. With deep understanding of the two cultures, Dr. Sundgren pointed to the importance to industry of cultivating and maintaining robust long-term relationships and collaborations with research universities. "We can't do everything ourselves", he said, "Working with universities creates value for the universities, and for us." Volvo has developed long-term relationships with selected universities "and this", he noted, emphasizing the importance of long-term "could take us on the road to sustainable transport systems." There are a number of challenges that the transport industry faces in trying to reach that goal including air quality issues, green house gases, congestion and casualties. Overcoming these problems while balancing mobility, accessibility and affordability while ensuring high safety and security levels will require innovative solutions. Dr. Sundgren pointed to the fact that such solutions will not stem from R&D alone, as important as that is but, require, interaction with all the stakeholders including politicians and mayors, NGOs and private citizens who use the transport.

An important point to emerge from the presentations by the industry representatives is the acknowledgement that by driving down emissions legislation has created value for societies and at the same time served as a driver for innovative technologies that create value for companies as well. Similarly, as the companies have strived to improve energy efficiency and waste reduction in their own facilities, they have found that the investments have proved profitable to the companies while creating a good environment for their employees. These environmental improvements can be expressed in ways that were brought out by previous speakers in which measures of success and progress in the corporate context, as with national economies, is gradually seen to shift from quantitative to qualitative measures.

Professor **Kazuhiro Ueta**, Dean of the Graduate School of Economics at Kyoto University reiterated the importance of the transition from quantitative to qualitative measures of "wealth" in measuring progress towards sustainable development. He noted a number of ways in which the inclusive wealth index can be applied to assessing progress toward sustainability citing in particular in assessing and evaluating the reconstruction and recovery process since the Great Tohoku earthquake and tsunami of 2011. The index he said is a robust tool for helping to evaluate not only physical and infrastructure damage but also damage to the determinants of quality of life or well being of the affected citizens.

Prof. Ueta went on to discuss the role of corporate responsibility or CSR in helping companies to develop strategies where inconsistencies arise between corporate

profits and social goals. The most important benefits of incorporating CSR in a company's strategy are two-fold, he noted:

CSR can help improve corporate profits while protecting a company's reputation, and

It is a program of actions that ultimately contribute to inclusive wealth and, hence, sustainability.

Panel discussion and conclusion

Following the presentations, Professor Kazuhiko Takeuchi, Senior Vice Rector of the United Nations University and Director of the IR3S at The University of Tokyo chaired an open panel discussion. He briefly outlined the history of initiatives that led to the present symposium, beginning with the creation of the Alliance for Global Sustainability (AGS) in 1997 together with the Swiss Federal Institutes of Technology (ETH), the Massachusetts Institute of Technology (MIT) and Chalmers University. Since then, these universities have gone on to work with others and create larger networks including, for example, the consortium on Sustainability Science that the IR3S has created to work with other universities as well as industry and local communities throughout Japan.

In the context of fostering university/industry partnerships, Prof. Takeuchi introduced Mr. Aiba, panelist representing Mitsubishi Estates who described initiatives the company has undertaken to design and build a new corporate headquarters in the Marunouchi district of Tokyo in front of the Tokyo Station. The plan is that the new complex will contribute to the sustainability of the city as well as to the company including energy savings, environmentally friendly building functions, and that it will be designed for disaster prevention. In this way, he noted, the corporation while adding to its value is also actively contributing to the creation of the most beautiful and sustainable city in the world.

Mr. Aiba, representing Mitsubishi, as well as the other industry speakers Olsson and Sundgren, spoke to the importance that creating value for and contributing to the sustainability of their employees and communities had for the profitability and competitiveness of their companies. In this context, Professor Ueta noted that corporate social responsibility might also be considered an "enabling asset" to the corporation, the way that enabling assets figured in measuring the sustainability of economies. In this sense, he noted, the Inclusive Wealth Index, is useful not only for policy, but it can be helpful in making an assessment of CSR as well. Aiba's presentation, for example, seemed to support the progression that management expert Michael Porter notes in his theories concerning the movement of corporations from corporate social responsibility to "creating shared value" (CSV). CSV, according to the Porter thesis, premises that the competitiveness of a company and the health of communities around it are mutually dependent, a lesson that all of the participating companies in the symposium apparently take to heart and embrace as part of their strategies. (See Porter and Kramer, 2011)

Panelists also discussed the importance of dealing with equity issues in the context of the inclusive wealth index noting that while intergenerational equity is fundamental to the definition of sustainability, north/south equity issues are equally important and urgently in need of re-dress.

The three corporations presenting at the conference were praised for their efforts to contribute to sustainability but at the same time others noted that their strong efforts were particularly enlightened and unusual. But as Dan Olsson noted, for family owned companies especially, like Stena, the company needs to be able to show and demonstrate its credibility. "If you have your values right", he said, "you get your strategy right."

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The symposium brought together academicians with representatives of industry and business to explore the value of and means to expand cooperative efforts to advance progress for sustainability. For while some steps have been taken in recent years to improve the quality of life for many of the world’s poor, humanity has failed to make significant progress toward safeguarding the world’s natural ecosystems or otherwise ensure its own long-term viability. (Dasgupta and Duraipah, 2012) As its title implies, the intent of the symposium was to explore through presentations and panel discussions insights into the ways in which collaborations between industry and academia could contribute to progress towards a “mature and sustainable society”. By “mature” is meant a society that has moved beyond thinking about what it can do to advance sustainable development to taking the necessary steps – action – to achieve sustainability. Barriers to making such progress are not insignificant. Among those identified during the symposium are:

- Our present economic paradigm focused on material wealth as the key ingredient for well-being and development ignores social, ecological, and human factors that may be the most essential constituents of well-being
- Traditional indicators to assess progress of nations today (GDP and the Human Development Index, HDI) do not take account of the state of the natural environment (natural capital assets), or indicate whether levels of well-being are sustainable
- The knowledge explosion of recent decades has not led to improvements in global well-being in part because it remains fragmented/unstructured
- Incentives to meet global ecological and social challenges through the development and application of innovative policies, technologies and practices are weak or lacking
- While sustainability issues require long-term solutions, both industry and government operate on the basis of short-term rewards

In order to overcome these barriers, the symposium produced the following action points. The time has come for universities to:

- Replace common measures of progress (GDP and HDI) with the more robust means (such as IWI) that include natural capital and human health and that take account of inevitable trade-offs and substitutions
- Support a radical shift in defining progress and growth from simple economic quantitative measures to a basket of measures including more

comprehensive quantitative indicators such as the Inclusive wealth index but also qualitative measures that provide measures of subjective wellbeing of individuals and communities.

- Support a radical shift in defining progress and growth from quantitative to qualitative measures
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