

# **Asian Vision on Transdisciplinary Sustainability Development and Environmental Research**

**Planet under Pressure: New Knowledge towards Solutions**

**26-29 March 2012**

**London International Convention Center (ICC, ExCel)**

**London, United Kingdom**

## **SESSION PROGRAM**

**Session Number:** 146

**Day 2:** Options and Opportunities

**Theme B:** Transforming our way of living: development pathways under global environmental change

**Date and Time:** 27 March (Tuesday), 10:30-12:00

**Venue:** Room 8 (ICC, Excel)

### **Abstract**

Asia has a strong potential for environmental change research with its existing issues from urbanization to resilience. These experiences can devise best practices through active science-policy-industry interaction. This session aims to identify changing aspects of sustainability development that are unique to Asia and discuss opportunities that will lead to formation of an Asia vision with global perspectives and regional dynamism.

### **Conveners:**

Prof. Makoto Taniguchi, Research Institute for Humanity and Nature (RIHN)

Prof. Klaus Töpfer, Institute for Advanced Sustainability Studies (IASS)

Prof. Tetsuzo Yasunari, JSPS-GEC Japanese Chapter, Nagoya University

Prof. Charles L. Redman, Arizona State University

Prof. Akio Takemoto, Asia-Pacific Network for Global Change Research (APN)

## **CONTENT**

Discussing sustainability development with environmental change has become an increasingly important challenge for the earth system science communities and policy initiators, and observing recent practices of these interactions between humanity and nature reveals clear examples and opportunities at the regional level.

Asia as a region has the potential to deal with issues of sustainability at regional level; focusing on integrated environmental research and policy implications that will allow for innovative channels to be pursued by the global community for future socio-ecological systems. With its existing issues from urbanization and resilience to natural disasters to accessing water and dealing with the impacts of global climate change, Asia has a strong potential for environmental change research and sustainability development. Hence, these experiences can devise best-practice scenarios for humanity-nature co-habitation through active science-policy-industry consultation and interaction with other regional and global stakeholders.

With this background, this session calls for paper and poster presentations that share transdisciplinary approaches and best practical experiences in Asia, and particularly in developing countries, that have strong potential to support the Asian vision of sustainability development with environmental change research and education. As the conference is looking for transdisciplinary and applicable pathways of sustainability, our session aims to identify changing aspects of sustainability development that are unique to Asia by bringing together researchers from natural, social and humanitarian sciences, policy initiators and policy-makers interacting at national and regional levels and discuss opportunities that will lead to the formation of an Asian vision with global perspectives and regional dynamism.

## **FORMAT**

The proposed session will be held in a panel format with five presentations followed by a panel discussion. There will also be posters encouraging researchers to present examples of sustainability development and integrated environmental research on science-policy practices in Asian developing countries. The posters will be set in Poster Session 2 and also copies will be distributed in order to stimulate a lively discussion.

## **GOAL and CONTRIBUTION**

The proposed session aims at presenting the vision of sustainability development and environmental change research in Asia for future education, research and policy implications, so the targeted audience is expected to consist of a wide group of experienced and young scientists, local, national and regional-level decision-makers, NGO representatives and practitioners that are focusing on the development of a sustainable Asia with integrated environmental research approaches and perspectives. Hence, we focus on *Theme B (Transforming our way of living)* and *Day 2 (Options and Opportunities)*.

## SESSION PROGRAM

146-2-B, 27 March (Tuesday), 10:30-12:00 (90 min), Room 8

Session Chair (Uyar)

10:30~10:40

**Keynote Speech**

**Prof. Dr. Klaus Töpfer**

10:40~11:20

**Oral Presentations**

**What can India contribute to an Asian vision of sustainable development? Values, identities and inspiration**

**Dr. M. Padmanabhan<sup>1</sup>; Dr. A. Kumar<sup>1</sup>**

<sup>1</sup>Leibniz University Hannover, Germany <sup>2</sup>M.S. Swamianthan Research Foundation, Chennai, India

**BRIDGING Social and Ecological Systems: Thermodynamic Perspectives**

**Prof. J. Kim<sup>1</sup>; Prof. T. Oki<sup>2</sup>**

<sup>1</sup>Seoul National University, Republic of Korea <sup>2</sup>The University of Tokyo, Japan

**Disaster Risk Reduction, a key to transform society from unsustainable to sustainable**

**Prof. K. Takeuchi<sup>1</sup>; Dr. S. Tanaka<sup>1</sup>**

<sup>1</sup>ICHARM, Japan

**Towards building from regional sustainability in monsoon Asia and its implication to global sustainability**

**Prof. T. Yasunari<sup>1</sup>**

<sup>1</sup>Nagoya University, Japan

**Global Environmental Change-Japan Initiative for Sustainability Development and Environmental Research in Asia**

**Dr. A. Uyar<sup>1</sup>; Prof. M. Taniguchi<sup>1</sup>; Prof. T. Yasunari<sup>2</sup>; Prof. T. Nakashizuka<sup>3</sup>; Prof. Y. Himiyama<sup>4</sup>**

<sup>1</sup>Research Institute for Humanity and Nature, Japan <sup>2</sup>Nagoya University Global COE Program, Japan <sup>3</sup>Tohoku University Global COE Program, Japan <sup>4</sup>Hokkaido University of Education, Japan

11:20~12:00

**General Discussion**

Chair (Taniguchi)

Prof. Töpfer, Prof. Yasunari, Prof. Takemoto and poster presenters

**Poster Presentations**

**Poster Session 2 (27 March, Tuesday, 17:30-19:30, ICC Capital Hall and N11)**

\* All poster presenters are invited to join our session and take active part in general discussion.

## SESSION GUIDELINES

- \* Our time is limited to 90 minutes, so we kindly ask our presenters to be strict with the presentation limit of 8 minutes.
- \* All poster presenters are invited to join our session and take active part in our general discussions. In order to include your poster to our session, please bring an A4-size copy (about 40 copies) of your poster to the session so that we can distribute your poster copies together with this program on the session day.
- \* We plan to compile the discussions and possible results of our session in a briefing or digest paper to be published for the international science or other stakeholders' communities. If you have suggestions or would like to get involved with this process, you are most welcome.

## PRESENTATION ABSTRACTS

### **What can India contribute to an Asian vision of sustainable development? Values, identities and inspiration**

M. Padmanabhan<sup>1</sup>, A. Kumar<sup>1</sup>

<sup>1</sup>Leibniz University Hannover, Germany, <sup>2</sup>M.S. Swamianthan Research Foundation, Chennai, India

We present a transdisciplinary dialogue towards a sustainable and equitable vision in the field of biodiversity, focusing on the economic, ecological and social aspects of land use change in India. As an Indo-German joint project within the framework of social-ecological research we want to support the building of an Asian vision of sustainability. Our German-Indian dialogue aims to identify specific aspects of sustainability development that are unique to Asia, respectively India. For this end natural and social scientists meet with policy makers to engage in a dialogue what sustainability could mean in the context rapid modernisation with an outspoken gap between urban and rural areas at the case of agrobiodiveristy.

The paper rests on a sequence of methods. Building on local scenario-workshops with policy makers, we take the created vision of a sustainable future to higher levels of jurisdiction; the state and the national level. The vision as an attractive image of a desired future brings scientist, policy maker and citizens together to expresses who they are and what they want their region to become (Dhamotharan 2009). A vision is needed to derive inspiring objectives for sustainable development. We want to show that a vision has to be personal, passionate, holistic to be the foundation for environmental and societal change. It shall express the deepest values of a region and its members to be able to influence subconsciously what people do or not.

The current debate on sustainable transition (Smith, A. & Stirling, A. 2010) and transformation knowledge (Hirsch Hadorn et al. 2005) within sustainability sciences serves as a background to identify commonalities and distinctions between an Indian vision of sustainable development and European influenced concepts. We discuss, how social-ecological research in India can aid the creation of a Asian vision and derive concrete steps forward.

### **BRIDGING Social and Ecological Systems: Thermodynamic Perspectives**

J. Kim<sup>1</sup>, T. Oki<sup>2</sup>

<sup>1</sup>Seoul National University, Republic of Korea, <sup>2</sup>The University of Tokyo, Japan

Human societies and natural ecosystems bear severe consequences of accelerating entropic juggernaut in the form of climate change and global capitalism. The juggernaut metaphor implies the sacrifice we must pay for dissipating energy not only by the unstoppable consumptive use of energy resources but also by living systems for the maintenance of their organization. Non-equilibrium thermodynamics of an open, complex system best characterizes such resources flowing in (system entropy decreasing locally) and wastes flowing out (environmental entropy increasing globally).

Systems that exchange mass or energy with their surroundings and temporarily maintain themselves in a state away from thermodynamic equilibrium and at a locally reduced level of entropy are called nonequilibrium systems. Biological systems and socio-economic systems fall into this category. All living systems, including social-ecological systems (SES), are inherently dissipative structure; therefore, they are subject to the second law of thermodynamics. Social-ecological system is a combined system of social and ecological components and drivers that interact and give rise to results, which cannot be understood on the basis of social or ecological considerations alone. The framework of nonequilibrium thermodynamics could provide a pivotal hinge to connect these two different systems in dimensionality and complexity. In this presentation, theoretical background is reviewed along with an example regarding complex ecohydrologic systems in monsoon East Asia.

### **Disaster Risk Reduction, a key to transform society from unsustainable to sustainable**

K. Takeuchi, S. Tanaka

ICHARM, Japan

Disasters are an evidence of unsustainability, which is a result of high disaster risk. It forms a vicious cycle of high disaster risk unsustainable society. In order to shift a society to a low risk sustainable society, it is necessary to analyze the root causes of disaster risk and identify the keys to make a paradigm shift possible. Disaster risk is one of many risks preventing sustainability of society. The key occasion to make a shift

possible is the time when the risk structure becomes known through integrated research on disaster risk (IRDR). The IRDR initiated by ICSU and co-sponsored by ISSC and UNISDR is a global platform to promote such integrated research involving scientists, engineers, policy makers and administrators.

The ultimate engine of sustainable society is a combination of science and technology and human empowerment through good governance. Disaster risk reduction, a necessary condition of sustainable society is no exception. Classical Asian concepts for risk management and sustainable society need revisited and revised to contemporary practice. The presentation will try to show the way to make risk an opportunity.

### **Towards building from regional sustainability in monsoon Asia and its implication to global sustainability**

T. Yasunari

*Nagoya University, Japan*

About 60% of the global population is concentrated in Monsoon Asia, and the total GDP of Asian countries is equal to about one-third of the global GDP. The region as a whole is characterized by rapid population and economic growth and urbanization, great disparities of wealth both within and between countries, and social and ecological vulnerability to the potential impacts of climate change. At the same time, however, the region offers many examples of long-term social and ecological sustainability in the midst of great ecological diversity, including many traditional systems of agriculture and livelihood that have supported large numbers of people through time. Some contemporary sustainability challenges in Asia will require wholly new approaches in science, technology and governance; "innovation" will also entail more active recognition of the wisdom already embedded in traditional thought and patterns of livelihood. In either case, designing sustainable interactions between humanity and nature in Asia is a global challenge, for there can be no global sustainability without it.

In September 2011 in Kyoto, the international conference on **"Building from regional to global sustainability: Visions from Asia"** was held to discuss various issues related to the regional sustainability of the human-nature system in monsoon Asia, including water resources/ management, biodiversity and ecosystem services, land use change, urbanization and mega cities. This paper overviews some critically important results, and tries to identify and discuss these results, and discuss implication of these results, in adopting the action items and recommendation of the ICSU report(2010) on the " Earth System Science for Global Sustainability: The Grand Challenges" as well as in the "The Belmont Challenge" in the Asian context. The paper, then, describes their potential contribution to solutions to the key sustainability challenges in monsoon Asia.

## **Global Environmental Change-Japan Initiative for Sustainability Development and Environmental Research in Asia**

A. Uyar<sup>1</sup>, M. Taniguchi<sup>1</sup>, T. Yasunari<sup>2</sup>, T. Nakashizuka<sup>3</sup>, Y. Himiyama<sup>4</sup>

*<sup>1</sup>Research Institute for Humanity and Nature, Japan, <sup>2</sup>Nagoya University Global COE Program, Japan, <sup>3</sup>Tohoku University Global COE Program, Japan, <sup>4</sup>Hokkaido University of Education, Japan*

Global change and sustainability development within socio-ecological systems are main issues targeted within the process of earth system visioning and following earth system sustainability initiatives. Stretching from human dimensions of global environmental change to climate change, geosphere-biosphere and biodiversity, Global Environmental Change programs (IHDP, WCRP, IGBP and DIVERSITAS) provide main research collaboration and communication platforms for already agreed-upon grand challenges and solutions. The recent 10-year Initiative on Earth System Research for Global Sustainability of ICSU, ISSC and Belmont Forum alliance on global system change and sustainability challenges underlines the importance of regional nodes with structural frameworks connecting researchers, service users and policy-initiators on regional basis.

Realizing this necessity for regional consciousness and accumulative dialogue for better acknowledgment of common challenges and opportunities shared at regional level, the Research Institute for Humanity and Nature (RIHN) has initiated GEC-Japan (Global Environmental Change-Japan) platform in order to facilitate and promote institutional and research collaboration among Japan representatives of the Global Environmental Change Programs. Having its emphasis and starting point in Japan, the initiative endeavours to focus on establishment of sound and innovative research community to be the channel for Asia Vision on global change and sustainability development. This presentation will introduce the GEC-Japan initiative and discuss its mid-term and long-term projection for advancement of Asia vision interacting local experiences with global perspectives.

## POSTER PRESENTATIONS

(12 posters in alphabetical order of the first author)

### **Asia: proving ground for global sustainability**

**K. Abe (1), D. Niles (1), S. McCauley (1,2), D. Sinha (1,3)**

Research Institute for Humanity and Nature, Japan (1), G. P. Marsh Institute, Clark University, USA (2), Ciudad Territorio y Ambiente, Peru (3)

### **Ecological Sanitation: An Option for Sustainable Human Waste Management and Rural Food Security In Bangladesh**

**M. Chowdhury (1)**

Bangladesh Academy for Rural Development (BARD), Bangladesh (1)

### **Where Do the Farmers Live? The Case of 'Productive Green Lands' in the Mega-Urban Regions in Japan**

**A. Guseva (1)**

Research Institute for Humanity and Nature, Japan (1)

### **Humanity Boundaries as humanity-oriented regional counterparts to Planetary Boundaries**

**I.C. Handoh (1), T. Onishi (2)**

The Futurability Initiatives, Research Institute for Humanity and Nature, Japan (1), Faculty of Applied Biological Science, Gifu University, Japan (2)

### **A quantitative prediction for ecological and economical sustainability under different scenarios in Mongolian mobile pastoral systems**

**S. Kato (1), N. Fujita (1), N. Yamamura (1)**

Research Institute for Humanity and Nature, Japan (1)

### **Soil alkalization by overgrazing can delay the recovery of pastureland in Mongolia**

**R. Koda (1), N. Amartuvshin (2), S. Amartuvshin (3), N. Fujita (1)**

Research Institute for Humanity and Nature, Japan (1), Institute of Botany, Mongolian Academy of Science, Mongolia (2), Institute of Geoecology, Mongolian Academy of Science, Mongolia (3)

### **Tibetan Ethnobotany of Climate Change in the Eastern Himalaya**

**J. Salick (1)**

Missouri Botanical Garden, USA (1)

### **Changes in land use, biodiversity, ecosystem services and local livelihoods in tropical forests of Malaysian Borneo**

**K.T. Takano (1), M. Nakagawa (2), T. Itioka (3), K. Kishimoto-Yamada (4), S.**

**Yamashita (5), H.O. Tanaka (6), Y. Tokumoto (2), D. Fukuda (7), H. Nagamasu (8), M.**



**Ichikawa (9), K. Momose (10), S. Sakai (1), T. Nakashizuka (11)**

RIHN, Japan (1), Nagoya University, Japan (2), Kyoto University, Japan (3), The University of Tokyo, Japan (4), FFPRI, Japan (5), Okayama University, Japan (6), Kyoto University, Japan (7), The Kyoto University Museum, Japan (8), Kochi University, Japan (9), Ehime University, Japan (10), Tohoku University, Japan (11)

**“Environmental regionalism” within global change and sustainability development of Asia**

**A. Uyar (1)**

Research Institute for Humanity and Nature, Japan (1)

**SME-friendly policies and the contribution of local SMEs to community resilience**

**T. Yamamoto (1)**

Takushoku University, Japan (1)

**Features of ecological resources and their sustainable use: implication from case studies in Mongolia and Malaysia**

**N. Yamamura (1), R. Ishii (2), S. Sakai (1), N. Fujita (1)**

Research Institute for Humanity and Nature, Japan (1), JAMSTEC, Japan (2)

**Managing Adaptation to Environmental Change in Tourist Hot Spots in the Gulf of Thailand through a Coral Reef Management and Restoration Project**

**T. Yeemin (1), S. Pengsakun (1), K. Sangmanee (1), M. Yucharoen (1), M. Sutthacheep (1)**

Marine Biodiversity Research Group, Ramkhamhaeng University, Thailand (1)

**Contacts:**

**Convener, Prof. Makoto Taniguchi**

Research Institute for Humanity and Nature, Japan

E-mail: makoto@chikyu.ac.jp

Tel/Fax: +81-(0)-75-707-2255 / +81-(0)-75-707-2510

**Coordinator, Dr. Aysun Uyar**

Research Institute for Humanity and Nature, Japan

E-mail: auyar@chikyu.ac.jp

Tel/Fax: +81-(0)-75-707-2503 / +81-(0)-75-707-2510

**Technical assistant, Ms. Kiriko Yoshida**

Research Institute for Humanity and Nature, Japan

E-mail: kiriko@chikyu.ac.jp

Tel/Fax: +81-(0)-75-707-2261 / +81-(0)-75-707-2510

# **Asian Vision on Transdisciplinary Sustainability Development and Environmental Research**

**Planet under Pressure: New Knowledge towards Solutions  
26-29 March 2012  
London International Convention Center (ICC, ExCel)  
London, United Kingdom**

*Day 2, Options and Opportunities*

*Theme B, Transforming our way of living: development pathways under global  
environmental change*

*27 March (Tuesday), 10:30-12:00, Room 8*

## **Conveners**

Prof. Makoto Taniguchi, Research Institute for Humanity and Nature (RIHN)  
Prof. Klaus Töpfer, Institute for Advanced Sustainability Studies (IASS)  
Prof. Tetsuzo Yasunari, JSPS-GEC Japanese Chapter, Nagoya University  
Prof. Charles L. Redman, Arizona State University  
Prof. Akio Takemoto, Asia-Pacific Network for Global Change Research (APN)

## Session Abstract

Asia has a **strong potential for environmental change research** with its existing issues from urbanization to resilience. These experiences can devise **best practices through active science-policy-industry interaction**. This session aims to identify **changing aspects of sustainability development** that are **unique to Asia** and **discuss opportunities** that will lead to formation of an Asia vision with global perspectives and regional dynamism.

## Program

- **10:30~10:40 Keynote Speech**  
Prof. Dr. Klaus Töpfer
- **10:40~11:20 Presentations**
- *What can India contribute to an Asian vision of sustainable development? Values, identities and inspiration*  
Padmanabhan and Kumar
- *BRIDGING Social and Ecological Systems: Thermodynamic Perspectives*  
Kim and Oki
- **Disaster Risk Reduction, a key to transform society from unsustainable to sustainable**  
Takeuchi and Tanaka
- **Towards building from regional sustainability in monsoon Asia and its implication to global sustainability**  
Yasunari
- **Global Environmental Change-Japan Initiative for Sustainability Development and Environmental Research in Asia**  
Uyar and Taniguchi (Yasunari, Nakashizuka, Himiyama)
- **11:20~12:00 General Discussion**

## Session Posters

- **Asia Vision**
- Asia: proving ground for **global sustainability** (*Abe, Niles, McCauley, Sinha*)
- **Humanity Boundaries** as humanity-oriented regional counterparts to Planetary Boundaries (*Handoh, Onishi*)
- “**Environmental regionalism**” within global change and sustainability development of Asia (*Uyar*)
- **Cases of Sustainability Development in Asia**
- **Ecological Sanitation**: An Option for Sustainable Human Waste Management and Rural Food Security In Bangladesh (*Chowdhury*)
- Features of **ecological resources** and their sustainable use: implication from case studies in **Mongolia and Malaysia** (*Yamamura, Ishii, Sakai, Fujita*)
- A quantitative prediction for **ecological and economical sustainability** under different scenarios in **Mongolian mobile pastoral systems** (*Kato, Fujita, Yamamura*)
- Soil alkalization by overgrazing can delay the recovery of **pastureland** in **Mongolia** (*Koda, Amartuvshin, Amartuvshin, Fujita*)
- Changes in land use, **biodiversity, ecosystem services** and local livelihoods in tropical forests of **Malaysian Borneo** (*Takano et.al.*)
- Where Do the Farmers Live? The Case of 'Productive Green Lands' in the Mega-Urban Regions in **Japan** (*Guseva*)
- **Tibetan Ethnobotany of Climate Change** in the Eastern Himalaya (*Salick*)
- Managing **Adaptation to Environmental Change** in Tourist Hot Spots in the Gulf of **Thailand** through a Coral Reef Management and Restoration Project (*Yeemin, Pengsakun, Sangmanee, Yucharoen, Sutthacheep*)
- **SME-friendly policies** and the contribution of local SMEs to **community resilience** (*Yamamoto*)

# Discussion

- **Asia vision**
  - \* Global – regional – local
  - \* from Asia for global concerns
  - \* Time scale
  - \* Which issues we should focus on first
- **Transdisciplinarity**
  - \* Natural sci. / Social sci. / Humanity
  - \* Science and/in Society
  - \* Meta data sharing
  - \* Issues of transdisciplinary we should focus on first
- **Interdisciplinary research (Collaborative Research Actions)**
  - \* Funding opportunities and guidance
  - \* Issues: Mixture of developing and shrinking societies
  - \* Nature (Monsoon Asia/ Disaster) and Humanity (cultural diversity) interaction
  - \* Joint publications
  - \* Focus on collaborative platforms