RIHN 11th International Symposium

Asia's Transformations to Sustainability:

Past, Present and Future of the Anthropocene

March 10-11, 2017
Kyoto, Japan

Organized by
The Research Institute for Humanity and Nature (RIHN)
National Institutes for the Humanities (NIHU)
Inter-University Research Institute Corporation

PREAMBLE

During the last fifty years Asia has gone through a remarkable transformation from a largely rural, agricultural and protoindustrial region underpinned by Monsoon Asia's resource and ecosystem characteristics, to the global center of economic growth driven by massive imports of fossil fuels and the policy directives of the developmental states. Beginning from Japan, South Korea and Taiwan, and diffusing to Southeast Asia, China and to some extent even to South Asia, a series of industrial clusters were created along the coasts of Pacific and Indian Oceans. Political and economic forces reorganized Asia's resource base by combining locally available endowments of labour, land, water and eco-system services with imported capital, oil, natural gas and mineral resources. Manufacturing labour productivity rapidly rose, and urbanization was accelerated. A 1983 World Bank Survey *The Energy Transition in Developing Countries* spoke confidently of the transition from biosphere-based to fossil-fuel-based energy as a global trend.

Today the energy transition refers to a transition from fossil-fuels to cleaner and renewable energy. The term Anthropocene is used to express deep concerns for human impact on the planet. The Sustainable Development Goals (SDGs), a UN initiative, include a number of indicators relating to sustainability and resilience to disasters, along with socio-economic ones such as poverty reduction and inequality. Thus the entire 'economic miracle' projects, which dominated Asia and were underpinned by growth ideology, are under serious scrutiny. Yet how to absorb the legacy of such a history back into the more natural and sustainable resource base of Monsoon Asia is not in sight.

In 2016 the Research Institute of Humanity and Nature (RIHN) started its third term research program (2016-2023) with a new organizational design under three programs of social transformations under climate change, resource management and the creation of the 'lifeworlds' beyond the 'economic miracle' perspective. In this symposium, we present frontier knowledge directing these programs, to discuss the future of Asia's transformations to sustainability.

SESSION PROGRAM

Session 1 Impact of Climate Change, Water and Energy on Long-term Socio-economic Changes

This session discusses the impact of environmental changes on socio-economic development in comparative historical perspective. Data on temperature and other indicators of climate change are now becoming available over a long period of time, and new findings are being communicated to socio-economic changes. In Monsoon Asia temperature changes and the availability of water and local biomass energy were important determinants of population growth, economic development and sustainability. They induced labour-intensive and energy-saving technology in East Asia and water-intensive agriculture in South Asia. We report recent findings on these topics, and suggest their relevance to the understanding of the present.

Session 2 Wise Governance of Diverse Resources

This session will discuss on research perspectives towards wise and fair resource management systems considering inter-linkage of multiple resources by various stakeholders in different special scales. Recently, nexus structure among energy, water and food became a hot issue, though we need more comprehensive understandings and governance including other issues such as ecological resources which provide ecosystem services and local culture.

Session 3 Building Lifeworlds of Sustainability and Wellbeing

Our "lifeworlds" are composed of the physical spaces and socio-cultural spheres of our everyday lives. They are continually reproduced, reimagined, and evolving through an interactive and reflexive relationship with society, culture, and nature. Session 3 focuses on research aimed at illuminating reciprocal linkages between diverse rural and urban lifeworlds and contributing to the solution of sustainability problems by working with various societal partners such as governments, companies, and citizen groups. Special emphasis is placed on envisioning sustainable futures that improve wellbeing and gauging their feasibility.

PROGRAM

Friday March 10, 2017

Plenary Session

Chair: KUBOTA Jumpei (Deputy Director-General, RIHN)

09:30-09:35 Welcome and Introduction to Plenary Session
KUBOTA Jumpei

09:35-09:45 Opening Remarks
YASUNARI Tetsuzo (Director-General, RIHN)

09:45-10:50 Keynote Address 1

Anthropocene and Transhumanism
– or the ecumene as an anthroposcene –

Augustin BERQUE (École des hautes études en sciences sociales (EHESS), France)

10:50-12:00 Keynote Address 2

Does Chinese History Suggest a Sustainable Growth Trajectory?
Kenneth POMERANZ (University of Chicago, USA)

12:00-13:00 Lunch

Session 1 Impact of Climate Change, Water and Energy on Long-term Socio-economic Changes

Chair: NISHI Makoto (RIHN)

13:00-13:05	Introduction to Session 1 SUGIHARA Kaoru (RIHN)
13:05-13:35	Impact of Climate Change on Social Transformations in Japan and Beyond NAKATSUKA Takeshi (RIHN)
13:35-14:00	On Climate, Demography and Social Change in the Japanese Archipelago SAITO Osamu (Hitotsubashi University)
14:00-14:35	Monsoon Asia, Industrialization and Urbanization: The Making and Unmaking of the Regional Nexus SUGIHARA Kaoru (RIHN)
14:35-15:10	Carbon Forests and Rivers of Conflict: Writing South Asian Environmental History in the Epoch of the Anthropocene Rohan D'SOUZA (Kyoto University)
15:10-15:25	Coffee Break
15:25-16:00	Land Tenure and Degradation of Peatlands in Sumatra, Indonesia MIZUNO Kosuke (RIHN and Kyoto University)
16:00-17:20	Roundtable Discussion The above speakers, Mark METZLER (University of Texas at Austin, USA), SATO Takahiro (Kyoto University), WAKIMURA Kohei (Osaka City University), and Roy Bin WONG (University of California, Los Angeles, USA)
18:30-	Reception

Saturday March 11, 2017

Session 2 Wise Governance of Diverse Resources

Chair: NAKASHIZUKA Tohru (RIHN and Tohoku University)

09:00-09:05	Introduction to Session 2 NAKASHIZUKA Tohru
09:05-09:35	Concept of Wise Governance of Resources and Ecosystem Services in Asian context NAKASHIZUKA Tohru
09:35-10:05	Participatory Approaches for Co-design and Co-production on Water-Energy-Food Nexus Issues BABA Kenshi (Tokyo City University)
10:05-10:35	Considering Ecosystem Service Tradeoffs including Biodiversity and Culture in the Water-Energy-Food Nexus Kimberly BURNETT (University of Hawaii, USA)
10:35-10:50	Coffee Break
10:50-11:20	The Adaptive Watershed Governance: Biodiversity, Nutrient Cycling and Human Well-being OKUDA Noboru (RIHN)
11:20-11:50	Valuing Forest Ecosystem Services and Disservices - Case Study of a Protected Area in India Karachepone N. NINAN (Centre for Economics, Environment and Society, India)
11:50-12:50	Roundtable Discussion The above speakers
12:50-13:50	Lunch

Session 3 Building Lifeworlds of Sustainability and Wellbeing

Chair: KOBAYASHI Mai (RIHN)

13:50-13:55	Introduction to Session 3 SAIJO Tatsuyoshi (RIHN and Kochi University of Technology)
13:55-14:25	Future Design SAIJO Tatsuyoshi
14:25-14:55	Seeking Sustainability and Well-being through Asian Cultures and Values Rakesh KAPOOR (Alternative Futures, India)
14:55-15:25	Lifeworlds as Pedagogy for Socio-cultural Change: Sensuous Food Futures, Practices, and Meaning in Everyday Experience Steven R. MCGREEVY (RIHN)
15:25-15:40	Coffee Break
15:40-16:10	Sanitation Value Chain: Its Concept and Element Technologies FUNAMIZU Naoyuki (RIHN and Hokkaido University)
16:10-17:20	Roundtable Discussion The above speakers, TANAKA Ueru (RIHN) and ISHIKAWA Satoshi (RIHN)

General Discussion

Chair: TANIGUCHI Makoto (Deputy Director-General, RIHN)

17:25-18:25	Session Summaries and Discussion across All Sessions
18:25-18:30	Closing Remarks TANIGUCHI Makoto

Keynote Address

Anthropocene and Transhumanism – or the ecumene as an anthroposcene –

Augustin BERQUE
École des hautes études en sciences sociales (EHESS), Paris, France

Augustin BERQUE, born in 1942 in Morocco, is a French geographer, orientalist and philosopher. He is a professor of mesology at the École des hautes études en sciences sociales (EHESS, Paris). A member of the Academia europaea, he was in 2009 the first Westerner to receive the Fukuoka Grand Prize for Asian cultures, and admitted in 2017 in the Earth Hall of Fame, Kyoto. His numerous books have been translated into several languages, about ten of which into Japanese and three in English, including *Thinking through landscape* (Routledge, 2013).

Abstract

Watsuji's concept of *fûdosei* 風土性 may be rendered in two ways. As it is generally understood in Japan, it could be translated with *countryness*: the fact of being proper to a given region or country. In that sense, it seems to concern essentially premodern societies; but as Watsuji himself defined it ("the structural moment of human existence", *ningen sonzai no kôzô keiki* 人間存在の構造契機), and as, accordingly, I translated it with *mediance*, in other words the dynamic coupling of Being and its milieu (*fûdo* 風土 or *kansekai* 間世界, not to be confused with the environment, *kankyô* 環境), this concept is not only homologous to the pairing (*Gegengefüge*) revealed by Uexküll between the animal and its milieu (*Umwelt*), but its validity appears to be universal and transhistorical. Now, this structural moment of human existence has been foreclosed (locked out) by the modern ontological paradigm in the process of abstraction and dualisation, negating any mediance at all, which at the same time gave rise to the two antithetic poles of the modern subject and the modern object, and correlatively reduced the environment to an objectified mechanism. It is this process which entailed the Anthropocene: altering the environment to a degree which, by now, attains a geological scale. This is not all. Through the same process of objectification, the modern subject has begun to change profoundly its own animal body; this is what we call nowadays trans- or posthumanism. I question here that strange logic, in which foreclosing abstractly mediance leads to illustrating it concretely, and the ontology of that which, anew, manifests itself in the dynamic coupling of Anthropocene and transhumanism[1].

[1] A former, shorter version of this paper was published under the title « Anthropocene and transhumanism » in 5 *Designing Media Ecology*, vol. VI, Winter 2016, p. 56-63.

Keynote Address

"Does Chinese History Suggest a Sustainable Growth Trajectory?"

Kenneth POMERANZ
University of Chicago, USA

Kenneth POMERANZ is University Professor in History and the College and Professor of East Asian Languages and Civilizations at the University of Chicago, and was President of the American Historical Association in 2013-14. His publications include *The Great Divergence: China, Europe, and the Making of the Modern World Economy, The Making of a Hinterland: State, Society and Economy in Inland North China, 1853-1937*, and several co-authored, edited, and co-edited volumes. He is a Fellow of the American Academy of Arts and Sciences, and has received fellowships from the Guggenheim Foundation, the American Philosophical Society, American Council of Learned Societies, Institute for Advanced Studies, National Endowment for the Humanities, and other sources.

Abstract

In 1993, Mark Elvin published an article on Chinese environmental history called "Three Thousand Years of Unsustainable Growth." Elvin was not suggesting that nothing had changed over three millennia, but he was highlighting some basic recurring themes. These included a steady intensification of land use, driven both by resource-hungry states and by private households seeking increased income; a gradual expansion of markets, allowing people in China's the most densely-populated regions to buffer local environmental pressures through exchange with other regions; and (c) a resulting trend of overall environmental degradation, but one sufficiently gradual that expanding trade and labor-absorbing technological change could avert catastrophe, and even allow for modest improvements in human welfare (i.e. "development). Other scholars, including myself, have modified this picture, but also confirmed much of it, often suggesting that it retained some relevance even amidst today's much more rapid economic and environmental change. That 19th century China witnessed spectacular failures of sustainability seems less a matter of inevitable environmental pressures – though those pressures were certainly worsening – than of political and administrative failure, which made it difficult to act upon a growing awareness of environmental crises in anything but a limited, patchwork manner. Causation was thus dialectical rather than following a uni-directional causal chain originating in demographic and environmental pressure.

Today, of course, China again has an effective state: one which is determined to continue rapid (though decelerating) growth until at least 2030, but also keenly aware of mounting environmental problems. The further expansion of the division of labor – both within and beyond China's borders – remains central to its strategies for managing this contradiction, particularly in the crucial cases of water (and "virtual water) and energy; the relevant transfers involve both market and command mechanisms (e.g. the South North Water Diversion), and they extend well beyond China's political borders. In some cases, they complement familiar strategies for achieving other development goals: e.g. relocating particularly dirty industries towards western China, and trying to hasten a transition to a service economy.

Yet at least two problems seem unlikely to be solved by continued movement along existing trajectories. First, while the state is paying considerable attention to improving environmental governance, the challenges of doing this through the existing political structure – which severely limits citizen groups and the press, as well as judicial independence -- are enormous, and current trends (which emphasize top-down assaults on entrenched problems) are not encouraging. Second, even optimistic scenarios for improving the economic efficiency of energy and water use seem inadequate to reconcile current Chinese growth targets with sustainable levels of water use and GHG emissions. Barring an acceptance of slower growth, hope for sustainability would seem to rest on very rapid transitions to green energy technologies and major breakthroughs in water supply (e.g. far less energy intensive desalination techniques). Such institutional and technological breakthroughs are possible, but cannot be counted on: and they would represent a different way of making growth sustainable after all from those that have been most relevant to China's historical development.

Impact of Climate Change on Social Transformations in Japan and Beyond

NAKATSUKA Takeshi

Research Institute for Humanity and Nature, Kyoto, Japan

NAKATSUKA Takeshi is a professor in Research Institute for Humanity and Nature. Since his early career as a graduate student, he has been using nitrogen isotopes to study long-term variations of climate and its impacts on oceanic biogeochemical cycles. Recently, he changed his main research area from oceans to land and focused on using tree-ring oxygen isotopes to examine the relationship between climate change and human history. Investigating periodicity of climate during the last two millennia in Japan and the world, he now hypothesizes that past human societies were often damaged by multi-decadal climate variations as they were caught in a cycle of over-adaptation and subsequent failure of adaptation. *nakatsuka[at]chikyu.ac.jp*

Abstract

If abrupt degradation occurs for important environment or resource on which we have been relying for a long time, how can we adapt to it? Recent rapid global changes on natural and social environment urgently request us to seek new strategies for overcoming such difficulties and making our society sustainable. In Research Institute for Humanity and Nature, I have been conducting an inter-disciplinary research project among paleoclimatologists, climatologists, historians and archaeologists to elucidate human adaptations to abrupt climate changes ever occurred in Japanese long history. In pre-modern agricultural societies of Japan since introduction of rice paddy cultivation about 3000 years ago, changes in summer temperature and precipitation have been always influencing the rice yield and inevitably controlling the population and living standard for the people. Because the human adaptation or failure of adaptation to the changing climate in the past have structures similar to the human responses to on-going global environmental changes, precise reconstruction of climate variations and human responses in the past and comparison of the numerous examples beyond time and place must make us enable to find strategies of human adaptation to abrupt global environmental changes.

So far, we have found a common relationship between multi-decadal large summer temperature variation and occurrence of serious famine, based on paleotemperature proxies of tree rings and historical documents from 9th to 19th centuries in Japan, suggesting that rice cultivating people who are used to the warm productive climate for a long time, more than 10 years, could not adapted easily to the subsequent cold climate. We have also found that multi-decadal large summer precipitation variation, reconstructed by tree-ring oxygen isotope ratio, had often underlain large societal upheavals, characterized by active migration of people and increase of local conflicts probably induced by heterogeneous destructions of people's livelihood due to unprecedented numbers of flood and drought occurrences.

The enhancements of multi-decadal summer precipitation variability happened at about 400 year intervals since Early Yayoi era, and it is surprising that they were all followed by the periods of major societal regime shifts both in Japanese and Chinese history since 2500 years ago, possibly reflecting changes in East Asia summer monsoon activity as the common driving factor. However, contents of resultant social transformation were completely different among many cases, such that in some cases, the social transformation after the difficult climate period brought long lasting prosperity, but in other cases, it resulted in further upheavals of the society. The many historical examples are telling us the importance of adequate adaptation strategies which we should select.

On Climate, Demography and Social Change in the Japanese Archipelago

SAITO Osamu
Hitotsubashi University, Tokyo, Japan

SAITO Osamu, Professor Emeritus, Hitotsubashi University, is an economic and population historian who has been writing on various subjects in the fields of economic history, historical demography and environmental history. His recent publications include 'Forest history and the Great Divergence', *Journal of Global History*, vol. 4 (2009), 'Growth and inequality in the great and little divergence debate', *Economic History Review*, vol. 68 (2015), and 'Climate, famine, and population in Japanese history', in B. L. Batten and P. C. Brown, eds., *Environment and Society in the Japanese Islands* (Corvallis: Oregon State University Press, 2015).

Abstract

In the climate-famine-population paper I contributed for an environmental history book published in 2015, I discussed my findings about long-run changes in famine frequency in relation to climatic change as well as agrarian and socio-political transformations that took place over several centuries on the Japanese Archipelago. When I wrote that paper, however, I did not know anything about what was going on at RIHN. By taking in the findings by Takeshi Nakatsuka and his associates on summer temperatures, therefore, this short paper sets out a revised version of a table showing phases of climate change and famine frequencies from the fourteenth to the nineteenth century, in order to re-assess the significance of a sudden decline in the frequency of famine in the middle of the so-called warring states (*sengoku*) period of the sixteenth century.

Monsoon Asia, Industrialization and Urbanization: The Making and Unmaking of the Regional Nexus

SUGIHARA Kaoru
Research Institute for Humanity and Nature, Kyoto, Japan

SUGIHARA Kaoru is Program Director and Professor at the Research Institute for Humanity and Nature in Kyoto. Trained as an economic historian, he worked for Osaka City University (1978-1985), the School of Oriental and African Studies, University of London (1985-1996), Osaka University (1996-2006), Kyoto University (2006-2012), the University of Tokyo (2012-2013) and the National Graduate Institute for Policy Studies (2013-2016). He has written widely on Japanese, Asian and global economic history, including *Patterns and Development of Intra-Asian Trade* (1996 in Japanese), *Local Agrarian Societies in Colonial India* (co-ed., Curzon, 1996; Manohar, 1997), *Japan, China and the Growth of the Asian International Economy, 1850-1949* (ed., Oxford University Press, 2005) and *Labour-intensive Industrialization in Global History* (co-ed., Routledge, 2013). From 2007 to 2012 he acted as convener of a large-scale project on environmental sustainability in tropical Asia and Africa at Kyoto University. Most recently he has been writing on environmental and economic history, including 'Monsoon Asia, Intra-regional Trade and Fossil-fuel-driven Industrialization', in Gareth Austin ed., *Economic Development and Environmental History in the Anthropocene: Perspectives on Asia and Africa* (London: Bloomsbury Academic, forthcoming). He is a member of the Science Council of Japan and is vice-chair of its Committee for Future Earth. *sugihara[at]chikyu.ac.jp*

Abstract

This paper explores the historical significance of resource endowments for Asia's long-term economic development. Asia's capacity to hold a very large population over the last few centuries has been associated with the socio-environmental characteristics of Monsoon Asia. Its unique air and water circulation enabled its fertile lands, often at the month of the river, to become a site of intensive rice farming, dense population and the development of labour-intensive technology and labour-absorbing institutions. Availability of water, food and biomass energy there was essential to the 'carrying capacity' of the population.

Rapid industrialization after World War II, beginning in Japan, shifted the gravity of Asia's economy from China and India to 'maritime Monsoon Asia' where the growth of trade eased resource constraints, and imports of fossil fuels and raw materials were combined with local natural and human resources to develop an industrial complex along the Pacific coast. Urban development provided the growing population with water, food and energy, while the industrial complex combined technology, capital and labour with fossil fuels. The concurrent growth of cities and the industrial complex created a local nexus. Their networking formed a regional nexus.

Since c.1980 the entry of China, and later India, to the Asia-Pacific economy urged the regional nexus along the Pacific coast to embrace the environmentally less well-endowed parts of Monsoon Asia and other inland areas. The economic gravity shifted back to China (and India), by further developing the network of maritime nexus. But attempts to expand it into the Eurasian landmass, vividly expressed in China's 'One Belt, One Road' policy, are proving difficult, reaffirming the significance of environmental conditions for economic growth.

Carbon Forests and Rivers of Conflict: Writing South Asian Environmental History in the Epoch of the Anthropocene

Rohan D'SOUZA
Graduate School of Asian and African Area Studies, Kyoto University, Kyoto, Japan

Rohan D'SOUZA is associate professor at the Graduate School of Asian and African Area Studies, Kyoto University and is also affiliated as Senior Research Associate with the Centre for World Environmental History (Sussex University). His major research interests are in environmental history, technology studies and sustainable development. He is the author of *Drowned and Dammed: Colonial Capitalism and Flood Control in Eastern India* (Oxford University Press, 2006) and has published articles in peer reviewed journals and popular pieces in newspapers as well. His current research interests are aimed at exploring how environmental politics is being framed by the twin contemporary challenges of climate change and the 'epoch of the anthropocene'.

Abstract

South Asian environmental history has largely occupied itself with trying to explain the complicated and troubled relationships between dramatic ecological change and British colonial rule. The first framework — widely referred to as the '*colonial-watershed thesis* — claimed that British colonialism profoundly undermined the previous ecological harmony that characterized social organization in South Asia. In contrast, the '*continuities-with-change*' advocates argue that while the 'pace of change' was undoubtedly 'rapid and epochal', radical environmental transitions were not entirely new to the Indian sub-continent. In effect, rather than treating British colonial impacts as the only and most decisive ecological encounter, the 'continuities-with-change' view underlined the need for long term histories about human-nature relationships in the subcontinent. Whilst these two frameworks have over the years dueled, debated and generated a rich and productive scholarship, recent concerns about global warming and anxieties about climate change urge us to reconsider anew environmental history scholarship on South Asia.

In particular, this presentation/paper will explore how ideas about the 'Anthropocene' have begun to define and determine afresh direction for South Asian environmental history writings. Notably, with concepts such as the 'Great Acceleration' and notions about the environment brought on by recent ideas generated in the Earth Systems Sciences, the orientation and effort now has been to stretch periodization to thousand of years and to emphasize on the role of carbon production and global environmental change. One of the first attempts, in fact, to foreground the significance of the above mentioned conceptual shifts is through the 2005 Dalem (Germany) meeting which inspired the formulation of the Integrated History and Future of People on Earth (IHOPE) project. Put differently, what kinds of narratives will South Asian environmental histories craft to debate the global push for carbon forests (through REDD and REDD+) and to negotiate the increasing explosive possibilities for river conflict in South Asia?

Land Tenure and Degradation of Peatlands in Sumatra, Indonesia

MIZUNO Kosuke[1 2]

1. Research Institute for Humanity and Nature, Kyoto, Japan

2. Center for Southeast Asian Studies (CSEAS), Kyoto University, Japan

MIZUNO Kosuke is a professor of Research Institute for Humanity and Nature and also professor of development studies at Center for Southeast Asian Studies (CSEAS), Kyoto University. He has done studies on rural economy in Indonesia, especially in West Java from the analytical points of view on the institution, organization and collective action through the study focusing on land, capital and labor.
Since the start of democratization and decentralization in Indonesia, He has done research on the role of people's organizations/labor organizations (trade unions) on resource management, and institutional change in the economic development in Indonesia. Now he is a project leader of Research Project on Toward the Regeneration of Tropical Peatland Societies: Building International Research Network on Integrated Peatland Management at Research Institute for Humanity and Nature, especially focusing on the peatland restoration in Riau Province. His publication includes Mizuno, Kosuke, et. al. ed, 2016, *Catastrophe and Regeneration in Indonesia's Peatlands: Ecology, Economy and Society*, Kyoto-CSEAS Series on Asian Studies 15, Singapore: National University of Singapore Press Kyoto; Kyoto University Press, 466p., Mizuno, Kosuke, et. al. ed. 2016, *Sustainability and Crisis at the Village: Agroforestry in West Java, Indonesia. (the Talun-Huma system and rural social economy)* Yogyakarta: Gadjah Mada University Press, 320p, and Mizuno Kosuke, Pasuk Phongpaichit, ed., 2009, *Populism in Asia*, Kyoto CSEAS Series on Asian Studies Volume 2, Singapore; National University of Singapore Press, Kyoto; Kyoto University Press, 2009, 228p. *Direktori Serikat Pekerja/ Serikat Buruh Indonesia. Bandung, Indonesia: (Directory of Trade Unions in Indonesia)*, (Akatiga Pusat Analisis Sosial, Bandung), 2007, and *Rural Industrialization in Indonesia, a Study on Community-based Weaving Industry in West Java* (Institute of Developing Economies) in 1996. *mizuno[at]chikyu.ac.jp*

Abstract

In developing countries, forest tenure conditions tend to be contested, overlapping, and insecure These challenging conditions result from state appropriation of forests centuries ago. Lack of local control over forest use and management decisions is a lasting legacy of state appropriation. Peatland forests in Sumatra may be no exception to these trends. Most of peatland in Sumatra is the state land (*tanah negara*) from the ownership point of view, and the government controlled forest zone (*kawasan hutan*) from the forestry policy point of view. The principle of the state forest formed in 19th century in Indonesia. The forest that does not have special stipulation belonged to state. This principle was formed in Java first, and enlarged to all Indonesia with the 1865 Forest Act, and 1870 domain declaration. Nowadays 70 % of Indonesian land is state forest.

Peatlands in Sumatra, Indonesia are one of Southeast Asia's last resource frontiers and they are currently being exploited on a large scale, leading to massive fires and carbon emissions. Despite the global implications of this problem, few studies have investigated the social aspects of peatland degradation, limiting our understanding of potential sustainable management regimes for peatland resources. This study focuses on the factors causing land abandonment and fire, key precursors to peatland degradation. Village formation and land history in a village in Riau province were investigated by detailed household questionnaires, paying particular attention to how land is acquired and the land titling process. It was made clear how peatlands have been abandoned, or not. In case of not-abandoned peatland, people have a customary land rights such as inheritance and clearing, and also have land certificated with customary land right documents.

In case of abandoned peatland, peatland forests belong to the state forest area, and therefore people tend not to have any documents certifying land rights, of which peatlands were vulnerable to peat fire, then was abandoned. Those peat forest belongs to the state forest were logged and distributed among villagers, especially after 1995, have since been seriously burned and abandoned. State designated forest area were making large areas of peatlands vulnerable to abandonment and fire.

Concept of Wise Governance of Resources and Ecosystem Services in Asian Context

NAKASHIZUKA Tohru[1 2]

1. Research Institute for Humanity and Nature, Kyoto, Japan

2. Tohoku University, Sendai, Japan

NAKASHIZUKA Tohru is program director, and professor of Research Institute for Humanity and Nature, and professor of Graduate School of Life Sciences, Tohoku University, Japan. His major interests are biodiversity and ecosystem services of forest ecosystems. He is (co)author of numerous papers in peer-reviewed journals, chapters in edited books, including "Diversity and Interaction in a Temperate Forest Community. Ogawa Forest Reserve of Japan" (Springer-Verlag), and "The Biodiversity Observation Network in the Asia-Pacific Region" (Springer-Verlag). *toron[at]chikyu.ac.jp*

Abstract

Global environmental problems are related each other. Studies concentrating on single issue are not effective, and those consideration on inter-linkage of multiple resources involving stakeholders are essential to approach the problems. Recently, nexus structure among energy, water and food became a hot issue, though we need more comprehensive understandings taking into account other issues such as ecological resources which provide ecosystem services and cultural resources to attain sustainable society. In addition, there are also difference in beneficial spatial scales and linkages among ecosystem services. Thus, production, circulation and consumption of resources should be discussed in wide range of spatial scales with involvement of various stakeholders and/or actors. Sustainable use of resources require fair and wise systems and proper indices to manage these processes.

Asian systems are experiencing rapid change in economics, urbanization and populations, though partly keep traditions to manage resources in sustainable way, which associated with relatively rich cultural background in this region. Thus, the studies on such Asian experience of resource use may give important suggestions on future sustainability in the world.

We should try to explore wise and fair management system to cope with multiple-resource, by multiple-stakeholders, in multi-spatial scales by encouraging to raise new projects including such new and lacking aspects with innovative ideas by young scientists. In particular we need to develop the criteria for wise and fair resource use, and metrics to evaluate according to the criteria, such as efficiency, sustainability and fairness. I would like to present a tentative idea how we can synthesize the results of RIHN projects in the context of wise and fair resource use.

Participatory Approaches for Co-design and Co-production on Water-Energy-Food Nexus Issues

BABA Kenshi
Tokyo City University, Yokohama, Japan

BABA Kenshi is professor of the faculty of environmental studies at the Tokyo City University, Yokohama, Japan. He has research interests include consensus building, risk communication, and policy process within energy and environmental issues in local community. He is now involved in the human environmental security in water-food-energy NEXUS project of the RIHN (Research Institute for Humanity and Nature), and also in the government-funded (the Ministry of Education, Culture, Sports, Science and Technology) research project on climate change adaptation policy. He has contributed to the IEA Wind Task 28 committee and served as a contributing author of IPCC AR5 WGII. He has published numerous articles in the journal regarding environmental sciences, disaster research, civil engineering, and public policy. *kbaba[at]tcu.ac.jp*

Abstract

Building a consensus among relevant actors over trade-offs of NEXUS issues of water-energy-food is needed to realize sustainable and resilient society. To this end, Co-design and Co-product of science and society is required and formulating a system of social decision making at not only a local scale but also multiple scales such as international and region are indispensable. This lecture will introduce various participatory approaches for Co-design and Co-production on water-energy-food Nexus issues and other issues we have taken so far.

As one of the participatory approaches, the stakeholder analysis which collects local knowledge will be introduced. In case of Beppu, which has the top resources of hot spring in Japan, it identifies the stakeholders and their interests and clarifies the potential disputes and its prevention measure to realize a harmonious coexistence of geothermal resource between small power generation and hot spring utilization. Based on the above, a comprehensive arena of dialogue on geothermal resource are required to examine sustainable use of the resource.

As an approach to collect expert knowledge, the narrative scenario development via Delphi method will be also introduced. In this approach, quantitative expert knowledge which is especially the stakeholders are concerned about clarified with stakeholder analysis is transformed to qualitative stories via Delphi method in terms of confidence and significance. The tentative scenarios developed in this way will be examined at the arena of dialogue with the experts, the stakeholders and the general public in a form of scenario workshop.

Through these participatory approaches, integration of local knowledge and expert knowledge which can be called Co-design and Co-product will be accomplished, and it is also expected to realize sustainable and resilient society when many actors recognize the scientific evidence based risks and benefits for the future with an understandable form.

Finally, the lecture will propose an approach to verify how the issues identified in the local community scale are recognized in nationwide scale via online deliberation participated by nationwide stakeholders. With the verification, we can formulate a system of social decision making at multiple scales which provides insights of diversified perspectives for solve NEXUS issues.

Considering Ecosystem Tradeoffs Including Biodiversity and Culture in the Water-Energy-Food Nexus

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Abstract

Resource managers and conservation professionals are increasingly faced with land use and restoration choices that will result in various ecological, environmental, and cultural consequences. Economics can help to identify these tradeoffs by quantifying the benefits and costs of water, energy, and food-related projects over long planning horizons, as well as by optimizing allocations of these resources over multiple uses. In the following we illustrate frameworks for ecosystem tradeoff analysis using examples from Hawaii and Japan: land use decisions in Kaupulehu, Hawaii; forest restoration choices in Haena, Hawaii; water allocation over multiple uses in Obama, Japan; and renewable energy production options in Beppu, Japan. Each of these case studies involves choices that will affect inherent linkages between water, energy, and food in each system.

We begin with a case study from Kaupulehu, Hawaii as a model system to illustrate the importance of including cultural values alongside other ecosystem services. We consider landowner-informed future land-use (pasture, agroforestry, forest restoration, and coffee) and climate scenarios in the context of the cultural, ecological, and economic values. In the Haena, Hawaii case study we consider a number of current and proposed forest restoration scenarios and assess outcomes in terms of groundwater recharge, sediment, cultural value, and various ecological measures including native species' ability to persist, number of native species, ability to support wildlife, and functional diversity.

In the Obama, Japan case study, groundwater is an important resource for a variety of uses including domestic use, melting snow, and fishery production (via submarine groundwater discharge). Over-pumping groundwater has ecological implications on the important fishery resource near shore. We present a management model for determining groundwater utilization paths over time that maximizes net benefits across uses, including ecological and cultural benefits. Finally, in the Beppu, Japan case we consider tradeoffs between onsen, an important economic and cultural resource, and small-scale renewable energy production. Two primary types of onsen hatsuden (energy production using hot water and steam from the onsen) are under consideration: binary systems which are more productive but generate larger social and ecological damages, and smaller scale yukemuri hatsuden which have a much lower production capacity but are less harmful to the surrounding ecosystem and society. Failing to recognize these tradeoffs can result in sub-optimal allocation of resources with respect to the economy, the ecology, society and culture.

The Adaptive Watershed Governance: Biodiversity, Nutrient Cycling and Human Well-being

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Abstract

Technological innovations in the use of nutrients for food production, in particular nitrogen and phosphorus, have allowed the global increases in population growth and economic prosperity in the Anthropocene. Overexploitation of nutrient resources, however, can lead to nutrient imbalances that result from anthropogenic disturbance of natural biogeochemical cycles and result in cultural eutrophication and biodiversity loss. It is now recognized that nutrient imbalances and biodiversity loss are prevalent in the watersheds around the world, and pose a risk to sustainable human development.

In spite of such a risk, most citizens are not so interested in the global and regional environmental issues but are rather concerned about local issues related to their life and livelihood. Considering this dissonance in environmental consciousness, the ongoing project research aims to develop a framework for the adaptive watershed governance of sustainable watershed systems, leading to the solution of nutrient imbalances and biodiversity loss.

Stakeholder engagement in multi-level and multi-scale governance is facilitated to enhance biodiversity, nutrient cycling and human well-being, according to a working hypothesis that these are the three primary components for sustainability of social-ecological system and, like gears, also interdependently linked in community activities. Action research is implemented to empower members of each community within a watershed for conservation of indigenous environmental icon, defined as indigenous nature with special significance to local life and livelihood. This icon is essential to community-based well-being, which is not simply a collective measure of subjective well-being for the community members but a qualitative measure of how they alter their positive affect, happiness and life satisfaction with changing social and environmental properties through practice of conservation activities. As the value of engaging in such conservation efforts is shared among community members, the community-based well-being is reinforced through bonding social capitals in a positive feedback to biodiversity conservation and then biodiversity-driven nutrient cycling.

If such community activities enhance nutrient cycling at the watershed scale, they can stimulate strong collective public interest in ecosystem services. In disseminating scientific knowledge on the community dimensions of nutrient cycling in the watershed-based society, the ongoing project research will facilitate social engagement in community activities as well as "green consumption" of local products by non-community members who appreciate the public interests. Such links accumulate bridging social capital and increase economic incentives. Owing to increased public interests in the conservation activities, local communities may also gain institutional support from local governments. Such integration of local and scientific knowledge further enhances community-based well-being, and leads to empowerment of community activities. Both of such top-down and bottom-up approaches are adaptively taken to solve social as well as environmental issues at multi-scale.

To test this hypothesis, the adaptive watershed governance is applied to two extreme systems in Asia, the Lake Biwa Watershed in Japan and the Laguna de Bay Watershed in Philippines: the former is an infrastructure-oriented developed society and the latter a high nutrient-loading society.

Valuing Forest Ecosystem Services and Disservices-Case Study of a Protected Area in India

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Abstract

This study estimates the value of forest ecosystem services provided by a protected area in a biodiversity hotspot in India. It also addresses some of the shortcomings identified in existing literature by estimating the value of several intangible benefits, and disservices of forests ignored in most valuation studies, as well as the added value from intact forests as compared to from alternative landscapes. Using primary and secondary data, and economic valuation techniques the study shows that the total net benefits provided by the Nagarhole national park in Karnataka, India are considerable. The added value of benefits from the park is also higher as compared to from alternative landscapes considering just three ecosystem services. If these are factored in decision making it could strengthen the economic case for conserving forests in tropical countries such as India where there is immense pressure to divert forests for meeting development needs.

Future Design

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Abstract

One obvious, but important fact is that people to be born in the future are not present today. Although this fact is clear to the point of being redundant, it is of critical importance when considering its implications for the sustainability of communities, nations, and the world as a whole. Individuals in future generations are excluded from those discussions. This is problematic when agreements struck by individuals in the present are biased to present circumstances; this represents one of the fundamental problems facing issues related to sustainability.

To make a path towards sustainability, it is important to understand the global, social, and human systems that support it, as well as the linkages between them. Experimental studies are useful for gathering data on issues that influence the three systems across generations, as collection of reliable data over a long period is difficult due to changes in the social, political, and economic environments.

In the paper, we institute new mechanisms that allow members of the current generation to virtually communicate and negotiate with members of future generations. In communicative mechanisms, an individual from the present generation interacts and negotiates with others as if he/she were doing so on behalf of a future generation. This approach has some practical grounding; it has gained traction for local policy-making processes in Japan (Hara 2016). In this paper, we examine this framework through a laboratory setting to determine how well it reconciles the conflict of interest between present and future generations. More specifically, we examine how the forced salience of an imaginary future generation during negotiations improves benefits for that generation through an intergenerational sustainability dilemma game (ISDG) that describes a tension between one generation and those that follow it. In the ISDG, players adopt one of two sides. On one side, participants advocate positions that are beneficial to the present generation, exclusively maximizing the benefits of the current generation. On the other side, players advocate positions that are beneficial to future generations, supporting the principle of utilitarianism (providing the greatest happiness of the greatest number of people), the maximin principle (providing the greatest benefit of the least-advantaged members of society), and the notion of sustainable development (World Commission on Environment and Development, 1987). Each generation faces the tension between outcomes that maximize profits versus those that adhere to sound ethical standards.

Seeking Sustainability and Well-being through Asian Cultures and Values

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Abstract

Population, consumption and lifestyles are the three central elements leading to the crisis of sustainability and the disruption resulting from climate change in the late 20th century and the 21st century.

The path of advanced industrialization, urbanization and consumption shown by western developed nations (largely within a capitalist economic framework), and now rapidly being adopted in most parts of the world, including Asia, has led to the crisis of sustainability and well-being. The western trajectory of development has been demonstratively harmful to the environment.

Asia is not only nearly 60 per cent of the global population but also home to some of the largest and most dynamic economies in the world today. Many of these are still at low to middle income levels, and are expected to grow economically in a significant way in the next few decades. But the implications of this growth on the environment, resources consumption, climate change and sustainability could be nightmarish.

In this context, Asian countries need to not only adopt modern energy-efficient and renewable energy technologies, they also need to draw upon their cultural resources to see how traditional values and cultures can support the quest for sustainability and well-being. Asian cultures offer a possibility – a latent and, in many instances, a vanishing possibility – of providing an alternative mode of organization and living that could be more benign to the environment. Thus the extent to which Asian cultures can show an alternative path leading to greater sustainability is an open question.

This paper will examine and suggest values, ideas and practices drawn from Asian cultures, and particularly from India, that can support the quest for ecological sustainability. The struggle for adopting these values, ideas and practices will remain an ongoing effort, but it is extremely important to identify those ideas and practices in each country in Asia which could contribute to a more ecologically sustainable future for these countries, for Asia as a whole and for the world.

Lifeworlds as Pedagogy for Socio-cultural Change: Sensuous Food Futures, Practices, and Meaning in Everyday Experience

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Abstract

We are bombarded daily with messages of increasing socio-economic precarity, ecological catastrophe, and diminishing quality of life for future generations. To the best of its ability, science has offered a clear picture of what lays in store and how we might avert the looming Anthropocene crises, but such knowledge is largely ignored. For most of us dealing with the particularities of our everyday lives—raising families, working, relaxing, sleeping, eating—, detachment from the implications of these higher-order phenomena is not intentional, but simply a product of being and operating in the immediacy of our situations to meet our needs. We're so immersed and entangled in the soup of our everyday lives that *breaking out* of that attentiveness is very difficult. Yet, if we are to realize a sustainable society, we must not only question that which is "taken for granted," but also attune ourselves to ways of acting and being in the world that align with alternative sustainable cultural forms. At the same time, the material environments we inhabit need to be re-designed for minimal ecological impact. This paper invokes the concept of *lifeworlds* as a theoretical frame to make sense of the richness of experience in daily life and explore ways in which deep socio-cultural elements can be made more tangible and available to experimentation toward sustainability. Building on previous understandings of the term lifeworlds, I set out to delineate a conceptual space between Bourdieu's habitus, Habermas's theory of communicative action, and Karen Barad's intra-action. I also argue for the potential of lifeworlds as a pedagogical medium for motivating socio-cultural change able to reach a more intimate, more receptive channel that traditional environmental education does not. Examples related to sustainable food consumption and future visioning are used to highlight the ways in which lifeworlds of sustainability and wellbeing might be designed in practice.

Sanitation Value Chain: Its Concept and Element Technologies

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Abstract

The world's population is estimated to be approximately 10 billion in 2050, and this population growth will happen mostly in developing countries. UN Millennium Development Goals Report 2015 reported that 2.4 billion people are still using unimproved sanitation facilities, including 946 million people who are still practicing open defecation in 2015. And the developing world has still high under 5 mortality and poverty issues. On the other hand, depopulation and aging are progressing especially in rural area of developed world, and the financial capability of local government which is a management agency of sanitation system is becoming weaker and weaker. Sanitation systems are essential for promoting public health, preventing environmental pollution, conserving ecosystem functions, and recycling resources. The question of how to handle the waste of 10 billion people is therefore highly relevant to the global environment.

We are proposing new concept, Sanitation Value Chain, which has the following basic policies: 1) Put values of people and community in the centre of discussion, and prepare sanitation system to drive this value chain; 2) Design the sanitation system by focusing on direct incentive for individual users and community; 3) Recognize a sanitation system as an integrated system with social and technical units; 4) Design the sanitation system by making a good matching between social characteristics and prerequisites of technologies. We are also proposing the following new policy for sanitation technology: 1) Recognize Human excreta, used water as personal property, not waste; 2) Treat black and gray water to improve their value; Recognize the Sanitation Unit as an "asset" which provides income to users.

The above new policy for technology has led the following two important key words: "Don't Mix" and "Don't Collect" wastewater. And based on these key words, several new sanitation technologies have been developed which includes composting toilet; urine concentration unit; gray water treatment and reclamation unit; and agricultural technologies for recovered resources from sanitation.

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