Challenges to achieve transdisciplinary studies

*Akihiko Kondoh[1]

1. Center for Environmental Remote Sensing, Chiba University

The author discusses on the subjects to achieve transdisciplinary studies.

Keywords: Transdisciplinarity, Standards of Sympathy, idea(principle), rationality, World of Urban and Rural, Scientist's well being and social contribution

科学観

民主主義観	View of science	
	Linear model	Stakeholder model
Madison	①純粋な科学者 Pure Scientist 政策には関与せず 研究の成果を提示	③論点主義者 Issue Advocate 研究成果をもとに特定の 政策を提言、主張
Schattschneider	②科学の仲介者 Science Arbiter 研究成果を政策に提言	④複数の政策の 誠実な仲介者 Honest Broker of Policy Alternative 研究に基づき可能な複数 の政策を提言

Practical techniques for desertification control and livelihood improvement made with local people

*Ueru TANAKA[1]

1. Research Institute for Humanity and Nature

Due to rapid expansion of population and human activities, the use pressure on soils and ecosystems is increasing. It goes to marginal areas or vulnerable areas such as dryland, mountainous and slope land and wetland. Semi-arid Africa, an interest area in this presentation, is the typical area and the frontline of desertification inseparably associated with land degradation and poverty.
Desertification is one of the problems/issues of international community, as found in the ratification of UNCCD (1994).
Sahel region of West Africa is characterized by vast distribution of sandy soils, which is fragile to human activity, and fluctuating rainfall. Land degradation is appeared as soil erosion (both by wind and water), fertility depletion and disappearance of vegetation, mainly caused by human activities, such as collection of fuel wood, crop cultivation and animal husbandry, to support the daily subsistence. This fact poses difficulty to the efforts of desertification control.
Together with local people, we developed some practical techniques for agro-ecosystems management especially relevant to the fragile environment semi-arid Africa that enable both livelihood improvement and control of desertification. Some innovations are ‘fallow-band system’ and ‘contour-lines of Andropogon’. It may shift a concept of agro-ecosystems management from ‘human vs nature’ to ‘human with nature’.

Keywords: Desertification, Livelihood improvement, Desertification control, Beyond dichotomy of 'Human vs Nature', Participation of local people

Landscape change induced due to permafrost degradation in eastern Siberia: For knowledge-action with local communities

*Yoshihiro Iijima[1], Hitoshi SAITO[2], Yuichiro FUJIOKA[3], Masanori Goto[4], Atsushi Nakada[5], Hiroki Takakura[6]

1. Graduate School of Bioresources, Mie University, 2. College of Economics, Kanto Gakuin University, 3. Frontier Research Institute for Interdisciplinary Sciences, Tohoku University, 4. Slavic-Eurasian Research Center, Hokkaido University, 5. Hokkaido Museum of Northern Peoples, 6. Center for Northeast Asian Studies

In the recent decades, many kinds of climate-driven landscape changes have taken place in Central Yakutia (CY) of Sakha Republic, Russia. Development of thermokarst landscape is one of the important geomorphological evidences of permafrost degradation along with climate change in continuous permafrost region in CY. Increases in active layer thickness have caused rapid thermokarst subsidence since 1990s, which has negatively impacted boreal ecosystem and social environments. The rapid warming after 1990s and perennially wet climate causing extensive waterlogged surfaces during 2000s enhanced the warming and deepening active layer extensively. The changes in interannual trends of thermokarst subsidence and subsequent channeling and ponding provide us further understandings on current status of permafrost instability against climate change and its impacts on livelihood of people in CY.

The present study examined the relationship between permafrost degradation and eco-hydro-climatological changes in Churapcha in CY where the apparent environmental changes have been observed due to the unexpected climate–driven damages of permafrost-related landscape by transdisciplinary research project under “People and Community in the Arctic: Possibility of Sustainable Development” in the ArCS (Arctic Challenge for Sustainability) project funded by Japan. We carried out initial collaborative excursion and field research in September 2016 based on co-design of field research with local researchers at degraded dry grasslands and agricultural fields. We have attempted to extract current environmental issues and future perspectives of natural and social systems under activating permafrost environmental changes.

Keywords: Permafrost, Thermokarst, Alaas, eastern Siberia

Transdisciplinarity Approach toward Solution of Environmental Issues in Watersheds
- Process of Co-production of "Environmental Icons" in a Rural village in Shiga pref.

*Satoshi Asano[1], Kenichi Wakita[2], Noboru Okuda[1]

1. Research Institute for Humanity and Nature, 2. Ryukoku University

In watershed scales, environmental issues and the solutions vare aomng maro, metho, and micro scales. Therefore residennts can participate the environmental conservation activities by not global goals but local achievements which are based on their life and livelihood. Then we proporsed "Environmental icons" which residents can understand and measure the effects of environmental conservation activities by theirselves.In a rural village, Shiga Pref., candidates of environmental icons were chosen through dialogues among rice farmers and researchers.

In this presentation, we will report process of Co-production of "Environmental Icons" and progress.

Keywords: Rice cultivation, Transdisciplinarity science

Trans-disciplinary Approach of Marine Protected Area Designation in Tsushima

*Satoquo SEINO[1], Mitsuhiro AIZU[1]

1. Kyushu University

Marine Protected Areas (MPA) are attracting attention not only for protecting biological diversity and conserving the natural environment, but also for promoting sustainable fisheries and tourism on the local level. Bottom-up style decision-making that respects each stakeholder’ s independence is needed to manage a protected area in a busy part of the sea subject to a host of various uses; it also promotes harmony among stakeholders.
Information about various weather phenomena known for generations by local fishers and coastal residents (e.g. traditions, experience, wisdom, historical documents, local history) fused with scientific knowledge and the lastest technology can result in marine management methods well adapted to local conditions.
Surveys were conducted in Tsushima City (Nagasaki prefecture) and its adjoining seas, where marine protected area policy has been ongoing since 2010. As part of our consideration of “Collaborative oceanographic monitoring grounded in local knowledge,” We checked for correspondance between good fishing grounds (marine area known to be ecologically important by fishers) and physical oceanographic findings.
Transdisciplinary approach as 1)collaborative oceanography, 2)Fish ecology assisted by environmental DNA meta-barcoding, 3) Ocean GIS mapping of local knowledge and status of sea weed bed, 4)Meteorological disaster risk reduction of fishery. activities. Trans-disciplinary research is essential to link latent oceanogrhpic, ecological local knowledge to utilize in the process of MPA in changing climate situations.

Keywords: Marine Protected Area, Tsushima, oceanography

Combination Participatory Backcasting and Sustainability Transitions Study - A Case Study of "Future Fortunate Dining" Workshop

*KAZUHIKO OTA[1], Motoki Akitsu[2], Yoshimitsu Taniguchi[3], Mari Nakamura[4], Steven Robert McGreevy[1], Hiraku Kumagai[2]

1. Research Institute for Humanity and Nature, 2. Kyoto University, 3. Akita Prefectural University, 4. Nagoya Bunri University

The following may be mentioned as typical problems arising in deepening the involvement of local governments in policy aspects of sustainable development: setting short-term goals and not fulfilling their objectives sufficiently (Bulkeley and Broto, 2012). Factors such as division of policies and projects (eg, sectionismism) and discontinuous commitment (eg election) (Maas et al., 2012). For solve these problems, attention is focused on participatory governance, that is, transform from a top-down model to a bottom-up model through exchanging views of society's diverse stakeholders and forming consensus (Aylett , 2011). Among them, Transdisciplinary (TD) has been proposed as an effective approach to cope with sustainability issues in cooperation with society (Lang 2012, Scholz and Steiner, 2015).
As a success factor of TD research in Japan, common understanding of identifying stakeholders and continuing problems and financial problems after the project is pointed out (Mori 2014b). This report focuses on the effectiveness of participatory backcasting as a method for sharing and developing problem consciousness and outcomes between researchers and stakeholders. At the same time, we clarify the necessity of participatory backcasting and research on "Transformation to sustainable social system" in science and technology sociology. In addition, as a concrete example of participatory backcasting, a practical case of workshop for transition of agrifood system on the theme of "Future Fortunate Dining in 30 years from now" in Noshiro city, Akita prefecture will be introduced.
Participatory backcasting has been used in the Dutch government program since the early 1990s, due to the need for a wide range of stakeholders to participate to achieve the long-term goal of sustainability (Vergragt et al. 1993, Quist et al. 2001). The purpose of the implementation is to (1) analyze the adequacy and feasibility of the desired future goals and (2) encourage practice and policy making for that. Researchers and stakeholders participate in two stages of creation and evaluation of this future image (Carlsson-Kanayama et al. 2008). Participatory backcasting requires not only problem consciousness and sharing of predicted images, but also images that can be accepted by researchers and stakeholders (Veargragt, 1993). Also, it is important to mutually confirm the manageable / inmanageable aspects in realizing the image in the future. It is pointed out that mutual confirmation is necessary among researchers in different fields, too(Mori 2014a).
Measures promoted through participatory backcasting will focus on the aspects that can be managed at the present time (or by constructing mechanisms). However, with respect to the aspect considered as management impossible, sharing of knowledge about future ways of change and related factors becomes important in promoting common recognition about continuation after finishing the program and fiscal. Consequently, confirmation of STS research accumulation (Geels & Schot 2007, Wiek et al. 2011) is expected to bring much contribution to TD by concurrent with participatory backcasting practice. As a concrete example based on the above viewpoint, we introduce three workshop practices for transition of the agrifood system on the theme of "Future Fortunate Dining in 30 years from now" held in Noshiro city, Akita prefecture in 2016. The theme of the workshop are "What kind of dining table surrounded by Noshiro in thirty years?" and "What must we do now to realize that?" Eleven participants had the sketch of "Future Fortunate Dining" respectively, and exchanged views for realization. Regarding the accumulation of research on STS related to "Sustainability Transition", it is planned to supplement it by consecutive

contributions in local newspapers.
Participating backcasting with local governments is particularly important in the context of Japan where a strong civil society that affects national policies like the EU does not yet exist .

Keywords: Transdisciplinary, Participatory backcasting, Sustainability Transitions, Sustainable Food Consumption and Production

