

## Collaboration for the study on environmental change in "Permafrost and Culture"

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Arctic and high-latitude in northern hemisphere is the most susceptible region to global warming. In Northeast Eurasia, multiple impacts of hydrological changes due mainly to precipitation increase are accelerated as well as air-permafrost temperature rising after 1990s. The Arctic climate change has threatened landscape degradation in boreal forest and grassland, corresponding with increasing difficulties for not only indigenous forms of natural resource use but also for social infrastructure in the urbanized area during the recent decades. It means that these unprecedented environmental changes could exceed mitigation and/or adaptation abilities based on their local knowledges.

The RIHN research project No.C-07 entitled "Global Warming and the Human - Nature Dimension in Siberia" (RIHN-Siberia Project) has been carried out from 2007 to 2013FY. The project based on collaboration between natural and social sciences discerned that permafrost-ecosystem-hydrological changes produced frequent occurrence of spring and summer flooding, causing a great deal of damage to hay harvest for animal husbandry using grasslands in alases (grassland landscape in thermokarst depression) in boreal forest and sandbanks along the Lena River and furthermore severe situation that forced people to relocate from their settlement damaged by the perennial floods.

Growing international interest in permafrost degradation in eastern Siberia which was contemporary with RIHN-Siberia Project motivated to organize the Action Group "permafrost and culture (Permafrost and Culture: PaC)" in the International Permafrost Association during 2014 through 2015FY. Multi-disciplinary experts in cooperation with local researchers and stakeholders have promoted stimulate discussion in terms of permafrost degradation and its influence on indigenous people there. The issues are summarized as follows: From the natural science, 1) How did the permafrost ecosystems initially form?, 2) What kind of current changes are there?, and 3) What are the major biological-physical processes currently at work? From a social science, 4) How did the people interact with the permafrost ecosystems?, 5) How do the people use them today?, and 6) Will they be able to continue using them into the future and if so how?

In this presentation, we would like to propose possibility for effective framework based on learning from theses research development to find proper objectives and methods for managing actual environmental change.

Keywords: Permafrost, wet climate, eastern Siberia