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

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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

