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Impacts of infrastructure and climate changes on reindeer herding in the Yamal, west Siberia.

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The traditional landuse in the Yamal is reindeer herding practiced by nomadic Nenets herders. The hydrocarbon industry is presently the source of most ecological changes in the Yamal peninsula and socio-economic impacts experienced by migratory Nenets herders who move annually between winter pastures at treeline and the coastal summer pastures by the Kara Sea.

In central Yamal peninsula which is permafrost area both natural and anthropogenic changes have occurred during the past 40 years. Mega size Bovanenkovo Gas Field was discovered in 1972 and it was opened in production and in 2012. We have studied gas field development and natural changes like increases in shrub growth, cryogenic landslides, drying lakes in the region and these impacts to Nenets reindeer herding.

Nenets managing collective and privately owned herds of reindeer have proven adapt in responding to a broad range of intensifying industrial impacts at the same time as they have been dealing with symptoms of a warming climate and thawing permafrost phenomena.

The results of climate change together with the industrial development of the Yamal Peninsula have a serious impact to the Nenets nomadic reindeer husbandry. Their consequences make Nenets reindeer herders to change their migration routes and the way of working with reindeer. During several years, we were making interviews with Nenets reindeer herders about the influence of climate change and industrialization of the tundra on the quality of Nenets nomads' life and their work with reindeer. Reindeer herders said that impacts of industrial development have reduced their migration opportunities, as well as the quality of pastures for grazing, which has fatal the effects during icing on the tundra in the winter. At the same time, in the summer reindeer have more food because increasing of the green vegetation.

Here we detail both the climate change impacts and spatial extent of gas field growth, landslides drying lakes, shrub increase and the dynamic relationship between Nenets nomads and their rapidly evolving social-ecological system.