

FULL TITLE OF THE PROJECT AND ITS ACRONYM

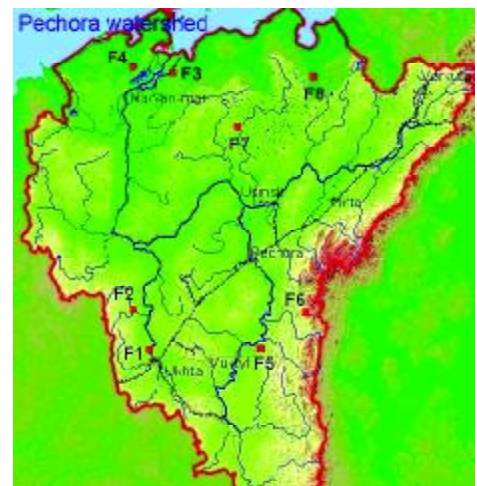
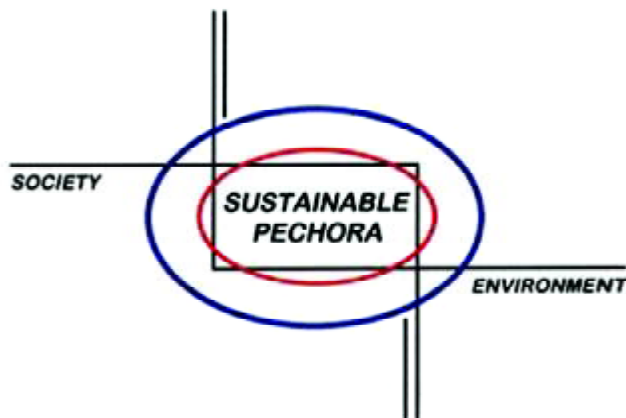
SUSTAINABLE DEVELOPMENT OF THE PECHORA REGION IN A CHANGING ENVIRONMENT AND SOCIETY (SPICE)

BRIEF PREHISTORY OF PROJECT

The Pechora region, which includes the North and East of the Komi Republic and a major part of the Nenets Autonomous Region, faces considerable challenges both in terms of socio-economic development and environmental conditions. The region has extraordinary natural resources, both renewable (e.g. forests) and non-renewable (e.g. coal, oil and gas). In addition, traditional livelihoods such as reindeer herding and fishing are important subsistence factors. In terms of the environment, the region is unique in continental Europe with extensive lowland tundra and permafrost in the North and the largest continuous old-growth taiga forest in the Ural mountains. The Pechora region has also a range of anthropogenic impacts, from almost uninhabited to relatively densely populated regions, from Indigenous economies to modern industries, and from pristine to heavily polluted areas.

Like the rest of Russia, the Pechora region faces economic difficulties related to the transition from a centralized system to a market economy. The conditions in the region are very special due to its rich renewable and non-renewable resources and its northern location. The oil and gas are of particular strategic importance to the region and to the European Union, and are expected to expand significantly. Some segments of the coal industry are in decline due to poor quality of the coal and expensive transport costs. Both the booming oil and gas sectors and the prospects of closing coal mines bring about significant risks of environmental pollution. The forestry sector has a high economic potential but management practices need to safeguard the high biodiversity. As a result of the present difficult economic times, an informal economy is prominent which if maintained could result in over-harvesting of wildlife and fish populations.

PROJECT LOGO & MAP OF THE PROJECT TERRITORY



DATES OF IMPLEMENTATION OF PROJECT

2000-2003

FUNDING ORGANIZATION

INCO-COPERNICUS 2 Programme of the European Commission

PROJECT CO-ORDINATORS

Dr P. Kuhry, Arctic Centre, University of Lapland, Rovaniemi, Finland
Dr V. Ponomarev, Institute of Biology, Syktyvkar, Russia

RESPONSIBLE SCIENTISTS

Dr V. Ponomarev
Dr O. Lavrinenko
Dr. C. Bobkova

GOAL AND TASKS

SPICE stands for sustainable development of the Pechora region in a changing environment and society. The overall aim of the SPICE project is to present strategies for sustainable development of the Pechora region (Northeast European Russian) formulated in consultation with stakeholders, to regional government. The project is interdisciplinary by its nature and involves economists, civil engineers, social anthropologists, geohydrologists, ecologists and experts in Arctic global change, pollution and biodiversity.



Specific objects of the project:

- to evaluate the present-day viability and employment of economic sectors in the Pechora region
- to understand public opinion about social and environmental conditions in urban and rural areas
- to investigate the distribution, transport and effects of pollutants in terrestrial, freshwater, deltaic and coastal environments
- to assess and contrast biodiversity in pristine, protected, managed, over-exploited and polluted areas of the Arctic coast, Pechora Delta, inland tundra, lowland taiga and Ural mountains
- to estimate possible impacts of climate change on the environment and economy within the next 20 to 100 years
- to develop cartographic applications of the region with the use of GIS-technologies
- to distribute results of the project in the scientific community through publications, conferences and a CD-ROM disc on the results of the work
- to formulate strategies for the sustainable development of the Pechora region after consultations with representatives of different sectors of population
- to discuss policy variants with regional government and the broad public during a final conference in the Pechora region

PROJECT STRUCTURE

The SPICE project had an integrated, problem solving approach. It answered a clear and immediate need of regional authorities for quality information regarding the state of society, economy and environment in the Pechora region. The work was organised in 4 research themes with a total of 13 workpackages (wps):

- A) Economy and Society (3 wps)
- B) Terrestrial and Aquatic Pollution (4 wps)
- C) Indicators of Biodiversity (4 wps)
- D) Impacts of Global Change (2 wps):



WP 1: Analyses of economic (formal) and subsistence (informal) sectors; employment and standards of living; demographics; alternative socio-economic development scenarios. Institute of Economy, Ural Division, Yekaterinburg, Russia.

WP 2: Social perception and stakeholder involvement. Department of Sociology, University of Aberdeen, Scotland, UK.

WP 3: Economic losses of infrastructure damage due to permafrost collapse. Stock Company Polarnouralgeologia, Vorkuta.

WP 4: Terrestrial pollution, based on lichen and soil analyses. School of Life and Environmental Sciences, University of Nottingham, UK.

WP 5: Aquatic pollution, based on surface water and sediment analyses. Institute of North Industrial Ecology Problems, Apatity, Russia.

WP 6: Historical pollution loading and ecosystem response based on sediment analyses. Environmental Change Research Centre, Department of Geography, University College London, UK.

WP 7: Pechora Delta and river monitoring. Rosgidromet, Archangelsk, Russia.

WP 8: Habitat classification and the analyses of landscape structure. Finnish Forest Research Institute, Rovaniemi, Finland.

WP 9: Biodiversity indicators on land. Arctic Centre, University of Lapland, Rovaniemi, Finland and School of Life and Environmental Sciences, University of Nottingham, UK.

WP 10: Aquatic biodiversity indicators. Institute of Biology, Komi Science Centre, Syktyvkar, Russia.

WP 11: Intraspecific genetic variability of spruce in tundra forest islands. Institute of Biology, Komi Science Centre, Syktyvkar, Russia

WP 12: Global Change in Northeast European Russia. Arctic Centre, University of Lapland, Rovaniemi, Finland.

WP 13: Forest ecosystems and global change. Institute of Biology, Komi Science Centre, Syktyvkar, Russia



An important integration/representation tool was the implementation of a dedicated geographic information systems, GIS, for the study area. Layers included topography, vegetation and permafrost zones, detailed habitat classification of the fieldsites, the location of monitoring sites, and thematic layers related to environmental pollution, forest ecosystems and forestry, infrastructure, population, and industrial and subsistence sectors.

MAIN SCIENTIFIC RESULTS

The international team assessed alternative scenarios for the sustainable development of the Pechora region in order to enhance the economic and social well-being of its population and protect the unique natural environment and its high biodiversity along the Barents Sea coast, in boreal forests, the tundra and the Urals. Specific attention was paid to the consultations with stakeholders. Researchers also considered the present-day state of formal and informal economic sectors, demography and employment, public opinion, environment and biodiversity in relation to the human impact on the natural environment (and climate change).

Field studies comprised the monitoring of bottom sediments from lakes, water discharge and hydrochemical composition of the Pechora river with an aim of estimating the amount and transport of heavy metals, organic carbon, hydrocarbon and pollutants in the region and their flux into the Barents Sea, and biodiversity of different aquatic and terrestrial taxa and related landscape parameters were measured. In the northern taiga the measurements of carbon flux were conducted. The results of the SPICE project were widely disseminated through brochures, a web-site, scientific publications and stakeholder conferences.

Results have shown that despite the presence of rich renewable and non-renewable resources, about 30% of the population of the Pechora region live below the poverty line. Therefore the starting point of any discussion about future sustainable development should be an examination of the possibility of increasing the living standards of all inhabitants. This aim should be achieved without damaging the unique natural environment of the region.



The current economic development of the Pechora region is characterized by the presence and expansion of several highly profitable sectors (e.g. oil and gas extraction), whereas other economic sectors are in decline (coal extraction, agriculture). Long-term economic dependence on one or few sectors is dangerous and cannot be considered sustainable particularly considering the high fluctuation of oil and gas prices on the international market.

Regarding the assessment of the biodiversity level and human-caused pollution in the region, the present state of the region's natural environment is quite satisfactory, though in some cases local sources of industrial pollution and decreases in biodiversity were recorded.

It was concluded, that in the Pechora region there are still vast undisturbed territories, unique in Europe. Rich natural resources and an almost pristine environment provide optimal opportunities for the sustainable development of this region, if living standards of its population increase and environmental protection can be facilitated.

The SPICE project has provided a scientific basis for the assessment of the present-day socio-economic and ecological conditions in the Pechora region and their comparison with future changes. The project and especially the meetings with stakeholders present have contributed to public discussion of development trends of the region in the future.

MAIN PRODUCTS

Αί αεί αά Ε.Ν. Ἰ δεδι αἱ ἰ οδαί ἰ αῦ δι εῦ εάνι ἂ ἰ ἂ-ἰ οηέι αἱ ἀαηηαεί ἂ // Ἰ εἱ εἱ αέῦ ηάααδι ὑο οαδδεοἰ δεέ δι ηηέε. Ἰ δι αεί ὑ, ἰ δι αἱ ἰ ς, ηεοοαοεε, ἰ οδε θαααεοεῦ, θαααί εῦ: Ἰ αοαδ. ἰ ἂααοί αδ. εἱ ἰ ο. (17-22 εἱ ἰ ῦ 2002 ἂ., Ἀδοαί ααεῦνε, δι ηηέῦ). Ἀδοαί ααεῦνε, 2002. Ο. 1. Ν. 298-301.

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Photo: I. Lavrinenko

Photo: Ye. Patova

1 This lake, situated in the floodplain of the Ortina river, a 1st order tributary of the Pechora river, near the Severgasprom gas exploitation field is still inhabited by valuable species of Coregonids common in the region.

2 Participants of the 2nd SPICE Project Coordination Meeting in the House of Science of the Kola Science Centre, Apatity, Russia, February 2001.

The Ekaterinburg Institute of Economy's specialists Ilya Yimadi and Elena Ignatieva executed an assessment of the actual economic situation and forecast for future developments in the Pechora region. 3

Prior to the flight to the next field site. From left to right: Ari Nikula, Peter Crittenden, Tony Walker, Tarmo Virtanen, Sergei Sendimirov, Vladimir Dauvalter, Genady Shulepov, Osmo Ratti, Peter Kuhry. 4