

Improved surface water quality and monitoring

by professional education, authorities' cooperation and adopting international procedures



SYKE / Anssi Karppinen

Safer water and resilience to climate change

FinWaterWEI II programme aims to enhance water security in Kyrgyzstan and Tajikistan through an equitable and integrated management of water resources.

The programme has supported 13 projects and has addressed four interlinked themes. Here we highlight the results of five projects implemented within the following two themes: 'Environment and health administrations to monitor the quality and quantity status of waters' and 'Adaptation to climate change'.

The projects have been implemented in close collaboration with a wide range of Kyrgyz and Tajik governmental stakeholders at all administrative levels, development partners, NGOs and academia.



Indicator-based water monitoring – forming a solid basis for decision-making

A prerequisite for good management and protection of lakes and surface waters is the availability of reliable data. Changes in the environment and in a watercourse can be detected and predicted only if sufficient data and information is available.

The Issyk-Kul Water project was a continuum of long term knowledge exchange and cooperation between Kyrgyz and Finnish environmental administrations. The project addressed the capacities of the whole process of water quality monitoring: sampling at various conditions, analysis and quality assurance at laboratories, data management and dissemination of data. Broadly recognized international good practices in water and environment monitoring, including novel testing methods, were introduced.

The key result of the project was the development of the Issyk-Kul area water quality and environmental monitoring programme, which leads the way for a modern nationwide environmental monitoring programme. The project facilitated the conceptual acceptance as well as the practical implementation of the monitoring programme through extensive capacity building in the field and laboratory work. The new skills and quality assurance procedures have notably increased the capacities of the Kyrgyz authorities to carry out the in-situ measurements of the key water quality parameters and to assess the status of water bodies – in essence the SDG 6.3.2.

- Tailor made **courses** and extensive **on-the job training** for more than 100 experts.
- **8** thematic **study tours** to Finland to share international and European **best practices in practice**.
- Issyk-Kul area environmental monitoring programme set up for particular parts of water quality monitoring.
- The **Laboratory Information Management System LIMS** supports the daily data management at the Issyk-Kul territorial laboratory at Cholpon-Ata. The LIMS-database is a vital part of the ISEMWO (Informational System for Environmental Monitoring of Water Objects) which has been developed in close cooperation with the Kgz-Water/Son-Kul project.
- At the SAEPF's Laboratory in Bishkek new PC equipment and local network enhance the work. The use of LIMS institutionalized by an internal order in SAEPF.
- **Proficiency and inter-comparison tests** between Kyrgyz and Finnish laboratories to support systematic quality assurance work at the laboratories. New skills and tools to for defining uncertainty of analysis introduced.
- 300 pages of documentation prepared for the Kyrgyz Accreditation Center to seek **accreditation** for the Issyk-Kul territorial laboratory. LIMS validated in this context.
- **A new motor boat for coastal monitoring.** Biannual sampling missions executed by SAEPF.
- **3 deep water monitoring cruises** at Issyk Kul Lake with the scientific **research vessel "Moltur"** of Kyrgyzhydromet.
- Various campaigns, demonstrations and events organized with NGOs to raise the awareness of local population and businesses.
- A **Comparative Analysis** carried out to assess changes in the fragile lake. The fresh **indicator based Territorial State of the Environment Report** of Issyk-Kul summarizes the results of monitoring and analysis.
- Wide ranging collaboration with other stakeholders (e.g. Water Quality and Water monitoring Working group under Chu-Talas River Commission, Organization for Security and Co-operation in Europe OSCE, Kyrgyzhydromet and Public Fund and Voluntary Movement "Clean Issyk-Kul")

Son Kul Water - improving capacities to monitor harmful substances and manage data

The project aimed to increase the capacity of the Kyrgyz environmental authorities to determine POP compounds (Persistent Organic Pollutants) present in water, sediment, fish and benthos. In the 1970's DDT was intensively used in the surroundings of the Lake Son-Kul. Authorities were concerned about the possibility that POP residues could still be found in the lake and in living organisms, possibly causing severe health risks for human beings.

As a result of intense peer-to-peer training, the SAEPF (State Agency for Environmental Protection and Forestry) now has a good capacity to perform POPs analyses from water and sediment samples, and to produce information for assessing the water and food production safety. The project worked closely with NGOs in order to test and develop new public monitoring practices.

Kyrgyz software companies developed the basis for a countrywide **Informational System for Environmental Monitoring of Water Objects** (ISEMWO) following Finnish experiences and models. The system is now in use at the SAEPF (Issyk Kul and Chu-Bishkek regions) and Kyrgyzhydromet, and it can be linked/expanded e.g. to other water information systems and laboratories.



- Issyk-Kul territorial laboratory at Cholpon Ata has the **ability to analyze persistent organic pollutants** from water and sediments. Kyrgyzstan's capacity to report and contribute the **Stockholm Convention on POPs** enhanced through new analytic skills and quality assurance procedures.
- **2 new boats** at disposal for monitoring of remote lakes.
- **Manual for public monitoring** in Kyrgyzstan published.
- ISEMWO is accessible online. The system stores **almost 5000 water analyses results** and the amount is constantly increasing. Water quality data can be **visualized** and assessed with a **map** application. The system is ready to be integrated with the National Monitoring and Management system of Environmental Information (KEREGE) which is being developed
- At the SAEPF's Laboratory in Cholpon Ata new PC equipment and local area network enhance data management.

Kyrgyzstan: 2016-2018, Implementation by Finnish Environment Institute - SYKE and the State agency for environmental protection and forestry – SAEPF, Kyrgyzstan. (anssi.karppinen@ymparisto.fi) Finland's contribution: 400,000 €

Capacity building on surface water quality monitoring in Tajikistan

The aim of the project was to increase the capacity of the Analytical Laboratory of the Committee of Environmental Protection as well as the Surface Water Laboratory of Tajikhydromet to monitor surface water quality. The best practices and tools developed for water quality monitoring within the longstanding collaboration between Finnish and Kyrgyz environmental authorities were tapped in Tajikistan.

The project addressed capacities in field work, laboratory analysis and data management. Quality assurance and introduction of international standards for monitoring systems were essential elements in the project.

- Increased capacity to manage **water sampling**, and **transport and storage** of the samples.
- 3 thematic study tours, training courses and on the job training for **35 experts**. As an output these experts to enhance their practices and procedures.
- Essential chemical reagents, equipment and training for the laboratory methods of UNECE water quality indicators from Guidelines for the Application of Environmental Indicators.
- A **new** fast, simple and more precise E. coli **method** in use in the Analytical Laboratory. The method for Ptot was modernised in order to avoid harmful chemicals in the analysis. Methods to analyse BOD, NH₄, NO₃ were audited.
- **Training ISO17025** inspired experts to propose solutions to improve their work.
- Data system created for the management of water quality data.

Tajikistan, 2015-2018. Implementation by Finnish Environment Institute, Committee of Environmental Protection under the Government of Tajikistan (CEP) (kirsti.krogerus@ymparisto.fi) Finland's contribution: 500,000 €

Strengthening regional cooperation on water quality management in Central Asia

Prevention of deterioration of water quality requires basin-wide cooperation. A framework is needed to discuss and coordinate assessments of the quality of water resources, to develop monitoring networks, target parameters, and to enhance information exchange in the transboundary basins.

The project aimed at establishing an institutionalized cooperation between national authorities of the five Central Asian countries. Steps were also taken to enhance exchange of information and knowledge on water quality.



- A **Regional Working Group on Surface Water Quality (RWG)** established within the frame of CAREC. Jointly prepared work plans and ToRs guide its future work.
- Specialists from national agencies trained on international best practices on water quality monitoring and information management.
- **5 national reports** and **1 regional report** assessing the needs of water quality monitoring systems, and the legal and policy frameworks published.

Kyrgyzstan, Tajikistan, Kazakhstan, Turkmenistan and Uzbekistan: 2016-2018. Implementation by UNECE (batyr.hajiyev@un.org), Finland's contribution: 175,000 €
<https://www.unece.org/environmental-policy/conventions/water/areas-of-work-of-the-convention/enwatercentralasia/water-quality-wq-project-2015.html>

Enhancing climate resilience and adaptive capacity in the transboundary Chu Talas basin

A scientific and technical assessment – called Transboundary Diagnostic Analysis (TDA) – and related Strategic Action Plan (SAP) was developed through a UNDP-GEF project to support water resources management in the transboundary basins of Chu and Talas rivers governed by the Kazakh-Kyrgyz transboundary Chu Talas Commission.

The project supported by Finland ensured that climate change aspects are included in the analysis. Climate projections and scenarios were taken into account in the planning process. A wide range of adaptation measures were identified and assessed and demonstration activities were implemented to engage stakeholders.

- A **permanent Working Group** on Adaptation to Climate Change and Long-term Programs of Action established within the Chu Talas Commission.
- **29** national experts from Kyrgyzstan and Kazakhstan **trained on climate scenarios and adaptation measures**.
- **Climate** change and adaptation considerations **included in the TDA and SAP**.
- **24** national experts **trained on water and health aspects** in the context of climate change.
- **Pilot projects** – such as floodplain forest restoration, training on water efficient irrigation, and safety monitoring system for the Kirov dam - **demonstrate benefits** of adaptation measures.
- Information campaigns, materials, trainings and press-tour increased **awareness** of climate change and possible adaptation measures.

Kyrgyzstan and Kazakhstan, 2015-2018. Implementation by UNECE together with the Chu Talas Commission, Kyrgyz Association of Forest and Land Users, BIOM (sonja.koeppel@un.org), Finland's contribution: 334,000 €
<https://www.unece.org/env/water/centralasia/chutalas.html>

FinWaterWEI II - Programme for Finland's Water Sector Support to Kyrgyzstan and Tajikistan
Duration: 2014–2018 Financing: Ministry for Foreign Affairs of Finland, Programme Budget: 7,750,000 €
Administrator: Finnish Environment Institute SYKE (tea.tornroos@environment.fi)

www.syke.fi/FinWaterWEI/en



Ministry for Foreign Affairs of Finland