

# CENTRAL ASIA HYDROMETEOROLOGY MODERNIZATION PROJECT

## Improving weather and climate information

### AT A GLANCE

**Region** Central Asia

**Risks** Extreme weather events exacerbated by climate change

**Area of Engagement** Strengthening hydromet services and early warning systems

The Central Asia Hydrometeorology Modernization Project is helping countries in the region adapt to disaster and climate risk by bolstering their weather forecasting and early warning efforts.

Satellite photo of broken ice float  
in Kazakhstan's Alakol Lake



Source: European Space Agency (ESA)

## A GEOGRAPHY OF RISK AMPLIFIED BY CLIMATE CHANGE

A geographically diverse region consisting of steppes, mountain ranges, rivers, and deserts, Central Asia faces a range of natural hazards. In Tajikistan, as much as 36 percent of the country's territory is under threat from landslides. In the Kyrgyz Republic, avalanches, which numbered over 330 between 1990 and 2009, pose a serious risk to communities. Such natural hazards, which also include floods and mudslides, are often exacerbated by conditions of pervasive poverty and weak infrastructure.

Across Central Asia, the impacts of climate change, such as rising temperatures and changes in weather patterns, are expected to intensify disaster risk in the coming decades. The rising temperatures alone could lead to the disappearance of more than one-third of the glaciers from the region's mountains by 2050, putting nearby communities at greater risk from flooding, landslides, and other natural disasters. Uncharacteristically high temperatures could also lead to a drop in agricultural yields of as much as 30 percent in some parts of the region, underscoring the threat that climate change poses to hard-won development gains.

## LEVERAGING WEATHER AND CLIMATE INFORMATION

By generating real-time weather and climate information that can be used to enable early warning systems, improve emergency response, and pinpoint critical areas of investment, hydrological and meteorological (hydromet) services have the potential to help Central Asia build resilience to the intensifying climate and disaster risk. Accordingly, governments in the region have been strengthening their hydromet capacity through the \$28 million Central Asia Hydrometeorology Modernization Project (CAHMP), which is supported by the Global Facility for Disaster Reduction and Recovery (GFDRR) and the World Bank. The project's main components include:

- ▶ Improving weather and climate observation infrastructure. Main activities include the automation and rehabilitation of dozens of hydromet stations, and installation of weather visualization and forecast-production systems in the Kyrgyz Republic and Tajikistan.

- ▶ Strengthening technical capacity of hydromet agencies. The project has provided specialized trainings and workshops for staff of the Kyrgyz and Tajik hydromet agencies. Both agencies have subsequently seen hikes in their operational budgets, in large part due to the recognition by national governments of their increased technical capacity.
- ▶ Making hydromet services more user-friendly and demand-driven. The project has enabled hydromet agencies in the Kyrgyz Republic and Tajikistan to archive their weather and climate information, thus making it possible for users to search and review this data much more systematically. Both the Kyrgyz and Tajik hydromet agencies are also exploring longer-term business development strategies, part of their efforts to intensify user engagement.
- ▶ Facilitating regional coordination and peer-to-peer learning. For instance, countries in the region have agreed on a common methodology to verify the accuracy of forecasting, and the project has led to the installation of regional numerical weather prediction capacity and the creation of a regional hydromet distance-learning system.

## LESSONS LEARNED

**Engagement with users of hydromet information is vital to ensuring that services are responsive to their needs.**

Case in point: the Tajikistan crisis management center needs to use and disseminate guidance about severe weather conditions to its regional and local branches, so the Tajik hydromet agency has worked closely with the center to align those needs with its own technical specifications for its services. A GFDRR and World Bank assessment had previously revealed that hydromet user needs in the region vary considerably by country and by sector.

**Local knowledge and leadership from host governments coupled with specialized expertise from development partners can make for an effective combination.**

While host government commitment has been vital to the project, implementation has been facilitated by the expertise of a range of development partners, including GFDRR, the World Bank, and the World Meteorological Organization (WMO). These partners provided specialized knowledge that complemented hydromet agencies' understanding of the local context. For instance, hydromet agencies have drawn upon the WMO's "cascading" forecasting methodology to improve their weather forecasting capabilities.

# Forecasting accuracy improved by up to 30%

## 100+ HYDROMET OBSERVATION STATIONS REHABILITATED

The project has rehabilitated and automated 33 meteorological stations and 3 hydrological stations in the Kyrgyz Republic, as well as 54 meteorological stations and 16 hydrological stations in Tajikistan. These efforts, coupled with better access to satellite data and global computer models and specialized training for experts, have dramatically improved the region's hydromet capacity.

## FORECASTING ACCURACY IMPROVED

By strengthening hydromet capacity in Central Asia, the project has helped improve weather forecasting accuracy in the region by up to 30 percent. The Kyrgyz and Tajik hydromet agencies now report accuracy levels of 95 percent and 85 percent respectively, well above earlier levels. Both agencies have also reported a sharp improvement in their river-flow forecasts.

## REGIONAL HYDROMET COOPERATION STRENGTHENED

Recognizing the cross-border nature of meteorological hazards, Central Asian governments have made significant progress in strengthening regional hydromet cooperation. Four hydromet agencies (Kazakhstan, the Kyrgyz Republic, Tajikistan and Uzbekistan) have agreed to a common methodology to verify hydromet forecasting accuracy, completed installation of the regional distance learning system, and also reached consensus on guidelines and approaches to regional procedures for emergency prevention.