Geo information and flood commutation as one of the tools for climate change adaptation.

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Case study from the Dniester river basin

Brief information

The availability of and access to adequate and timely information are important for efficient water and flood management in shared water basins, especially in the transboundary context. To improve access to vital information in the Dniester river basin, a geographic information system[1] was developed through collaboration with both riparian states (Moldova and Ukraine). Based on the same information, the first ever Environmental Atlas of the Dniester[2] was published. The Atlas is the first attempt to present the state of the environment of this transboundary basin in a visual format; it includes over 30 thematic maps, graphics, diagrams and photos.

Two automated stations for monitoring the flow of the river were installed in the upper part of the basin with the idea that automated hydrometeorological data are to be increasingly exchanged between the countries. The stations collect information and transmit it directly to Ukraine's Dniester-Prut Water Basin Authority in Chernivtsi. In future this information will flow in real-time also to other users, including those located downstream in the Republic of Moldova and the one-million-population city of Odesa in Ukraine.

A special study was undertaken to assess the existing capacities, practices and information flows related to communicating flood risks in the Dniester basin at the national, the local and the cross-border levels. The study recommended improvements in delivering information on flood risks and issuing warnings to the population in the basin. The findings, discussed in a dedicated workshop with water, hydrometeorological and emergency response agencies of Moldova and Ukraine, will be used to strengthen flood communication locally and nationally and the exchange of flood information and warnings between the countries.

Participants of the session

Representatives of Kazakhstan, Kyrgyzstan, Russia, Ukraine, Belarus, Moldova, Azerbaijan, Georgia and Tunisia took part in the toll market; mostly they represented hydro-meteorological services, water agencies, ministers of environment and international organizations.

Main points of discussion

- **Availability of information**
  - ***the Enguri and Cxeniscqali rivers basins:*** the rivers are situated in the Svaneti region of Georgia, in the highest inhabited mountain area of the Caucasus. The floods are very dangerous here because of extremely fast flow that can damage households in a very short period of time. There are no monitoring networks there, flood modeling and forecasts are not provided, and information exchange and cooperation with the neighbouring regions are poor or are absent at all;
  - ***the Mejerda river basin:*** the Mejerda river in North Africa flows from north-eastern Algeria through Tunisia before emptying into the Gulf of Tunis and the Lake of Tunis; it is Tunisia's crucial waterway providing water to the country supply facilities, it is used for irrigation by the region's agriculture and is also a vital to the people living near the river. On most of the territory of the basin the monitoring networks are absents or inefficient; cooperation between riparian countries on conservation and sustainable development is very weak, apart from cooperation over groundwater.
- **Hydro-meteorological data exchange**

[1] http://82.116.78.174/en/about-geoportal

[2] http://dniester.grida.no/ru/about-project/dniester-env-atlas

- ***the Dniester river basin:*** 2 automated stations for monitoring the flow of the river were installed in the upper part of the Dniester river basin (Ukraine) – please see the introduction above. Additionally, 7 automated stations for monitoring the flow of the river were already installed and 20 more will be installed this year in the Moldovan part of the basin. The stations will collect hydro-meteorological data in real time and transmit them to responsible organizations downstream. The challenge for the future is to create a joint system for hydro-meteorological data exchange and connect to it all the automated posts. Some of the anticipated technical problems are that the flow monitoring equipment and software is from different producers; some of it is not certified in the countries; the posts are serviced by different organizations within countries;
- ***the Chu and Talas rivers basins:*** the monitoring networks in Kyrgyzstan and Kazakhstan are under development, the technical facilities of the existing monitoring networks are obsolete and do not perform according to the standards set by the World Meteorological Organization; data exchange within and between the countries is weak. The World Bank is about to support the modernization of the hydro-meteorological monitoring stations in Kyrgyzstan.

- **Efficiency of using forecasts for taking decision**
  - ***the Dniester river basin:*** taking into consideration that all forecasts have a high level of uncertainty, officials are very cautious in issuing warnings and evacuating the population as such actions will incur considerable costs. As a result, in most cases officials spend considerable time for taking such decision while the actual losses and damages are increasing.
  - ***all basins:*** the human factor plays a key role in the timely transfer of information and taking decisions in most emergency situations (i.a. floods).
- **Flood communication**
  - ***the Adagum and Abin rivers basins:*** the rivers are located in the Krasnodar Krai (region) in southwest Russia, near the coast of the Black Sea. In 2012 the territories of these rivers basins, especially near Krymsk city, were affected by a catastrophic flood. 171 people died and nearly 13000 people lost their homes during the flood. Still there is no known officially established cause of the flood. According to the Russian Hydrometeorological Centre, the forecasts and warnings were sent in time, but failed to alert the local population;
  - ***the Danube river basin:*** flood communication plans are elaborated for all communities in the Ukrainian part of the basin, however there is no rigid officially established order for the interactions between agencies during floods. The main authority able to take decisions on actions is the Commission on Emergency Situation which is allowed to use emergency funds for evacuation and reconstruction work. Unfortunately only very limited funds are available for preventive measures.
- **Modeling and mapping of flooded zones**
  - ***all basins:*** the modeling and mapping of flooded zones are important for efficient water and flood management. In most basins there are no up-to-date electronic maps. In the framework of international projects only some of the most vulnerable areas are fragmentally modelled and mapped. An important recommendation from the discussion is to provide modelling and mapping of flooded zones for entire basins.
- **Warning and new methods of disseminating information**
  - ***the Pripiat river basin:*** the Pripiat river flows through of Ukraine and Belarus, and many flood prevention and protection projects are implemented in the basin. Taking into account the international experience on disseminating flood information and warning, new approaches are used: for instance in case of emergency warning messages are sent to every person's cell phone in the community.