



Environment Division
UN Economic Commission for
Europe



Office of Co-ordinator of OSCE
Economic and Environmental
Activities



**Fourth meeting of the Working Group on Flood Management and Adaptation to Climate
Change under the Dniester III floods and climate project
Kyiv, 1 December 2011**

List of participants

1. Valeriy Babchuk, State Agency on Water Resources of Ukraine
2. Mykola Babych, independent expert, Ukraine
3. Vera Balabuh, Ukrainian Hydrometeorological Institute
4. Yuriy Bisovetskiy, Ukrhidroenergo, Ukraine
5. Victoria Boyko, Ukrainian Hydrometeorological Centre
6. Victor Bujac, Ministry of Environment, Apele Moldovei, Republic of Moldova
7. Oleksandr Chayka, Ukrhidroenergo, Ukraine
8. Roman Corobov, International Environmental Association of River Keepers “Eco-TIRAS”, Republic of Moldova
9. Raul Daussa, OSCE Office of Coordinator of Economic and Environmental Activities
10. Andriy Demidenko, Global Water Partnership, Ukraine
11. Nickolai Denisov, Zoi/UNEP, Switzerland
12. Vladimir Drevetskiy, National University of Water Management and Nature Resource Use, Ukraine
13. Anatoliy Drozdov, Research Centre “Monitoring”, Bendery, Republic of Moldova
14. Jan Dzyuba, Dniester-Prut Basin Board on Water Management, Ukraine
15. Nataliya Dzyuba, Institute of Mathematical Machines and Systems Problems, Ukraine
16. Dmitriy Glazkov, World Bank in Ukraine
17. Ludmila Gorbacheva, Ukrainian Hydrometeorological Institute
18. Tamara Guvir, Ministry of Environment, Republic of Moldova
19. Ivan Ignatiev, NGO Ecospectrum, Bendery, Republic of Moldova
20. Aleksey Ishchuk, GIS Analyst Center, Ukraine
21. Sonja Koepfel, UNECE Water Convention Secretariat
22. Pavel Kolomiets, Ukrainian Centre of Environmental and Water Projects
23. Tamara Kutonova, Office of the Co-ordinator for OSCE Economic and Environmental Activities, OSCE Project Co-ordinator in Ukraine
24. Svetlana Krakovskaya, Ukrainian Hydrometeorological Institute
25. Bo Libert, UNECE
26. Ruslan Melian, Institute ACVAPROJECT of the Agency “Apele Moldovei”, Republic of Moldova
27. Lilya Michenko, independent expert, Ukraine
28. Boris Minarik, Slovak Hydrometeorological Institute, Slovak Republic
29. Yuriy Nabivanets, Ukrainian Hydrometeorological Institute
30. Mihail Pencov, Ministry of Environment, Apele Moldovei, Republic of Moldova
31. Grygoriy Petruk, Ministry of Ecology and Natural Resources, Ukraine
32. Hanna Plotnykova, Office of the Co-ordinator for OSCE Economic and Environmental Activities, OSCE Project Co-ordinator in Ukraine
33. Ludmila Serenco, State Hydromet Service of the Republic of Moldova
34. Irina Shtets, State Environmental Inspection of Ukraine
35. Tatyana Sinayeva, International Environmental Association of River Keepers “Eco-TIRAS”, Republic of Moldova
36. Svetlana Slesarenok, Ukrainian National Environmental NGO “Mama-86”
37. Gennadii Syrodoev, Institute of Ecology and Geography, Republic of Moldova
38. Volodymyr Tihy, independent expert, Ukraine
39. Ilya Trombitsky, International Environmental Association of River Keepers “Eco-TIRAS”, Republic of Moldova

40. Serhiy Vyhryst, independent expert, Ukraine
41. Natalia Zakorchevna, University “Krok”, Ukraine
42. Mark Zhelezniak, Ukrainian Centre of Environmental and Water Projects

Draft report

The fourth meeting of the working group on flood management and climate change adaptation under the Dniester III floods and climate project aimed to review progress made in mapping and vulnerability assessment as decided at the last meeting of the working group, held on 18 April 2011 in Chisinau.

The meeting was opened by introductory statements from representatives of UNECE, OSCE, UNEP and IWAC. Representatives of Ukraine and the Republic of Moldova welcomed the progress made in the project and expressed hope that the project would lead to useful final results.

Vulnerability assessment, scenarios and modelling

Experts presented their progress made regarding modelling, forecasting and risk mapping. First, UHMI Kyiv (Iurii Nabyvanets) and colleagues presented the analysis and projections of climate change on the Dniester basin as well as analysis of impacts of climate change on Dniester water resources. The presenter informed that an ensemble of seven climatic models including Regional Climatic Models (RCM) and Atmospheric and Ocean Global Circulation Models (AOGCM) had been applied in order to obtain predicted values of temperature and precipitation changes for the 2021-2050 period within the Dniester Basin on a monthly basis. To make calculations more accurate the Dniester Basin was subdivided into 6 parts according to models grids and real hydrometeorological data available. It was shown that different RCM and AOGCM models give different values for air temperature and precipitation changes and sometimes those differences could be quite significant. Analysis of data obtained lead to the conclusion that the regional model REMO provides the best results for all delineated regions and for the entire Dniester Basin; therefore, only the REMO model was used for hydrological modelling.

Retrospective analysis of severe meteorological events had been performed on the basis of observation data obtained at meteorological stations within the Dniester Basin. All data including primary ones and results of calculations were included in the developed databases.

The results showed a clear increase in temperature while the results for precipitation and water discharge were less clear and certain. It seemed that precipitation would increase during winter and decrease during summer. More extreme weather events such as heavy rains and flooding could be expected.

Participants commented mainly on the unclear projections for future precipitation and discharge. Due to this uncertainty in the modelling it was suggested to use instead a resilience-based approach, i.e. to assume floods might increase by 15% and check whether water management procedures would be resilient in such a situation.

Subsequently, UCEWP Kyiv (Mark Zhelesnyak and colleagues) presented the modelling and mapping of flood risks in selected areas. Geoinformation support and flood mapping as well as the survey of channel/ floodplain topography were also presented.

They recalled that after careful consideration two sites: “Mohyliv-Podylskiy- Otaci” in Ukraine and Moldova and “Dubossary NPP (Moldova) downstream till Mayaki (Ukraine)” were selected for flood risk modelling / mapping study at the last working group meeting and consequent discussions in April 2011. Subsequently, floodplain inundation at Mohyliv-Podylskiy- Otaci during historical and projected extreme floods scenarios was simulated with the 2D model COASTOX –UN based on the numerical solution of shallow water equations on an unstructured grid. GIS pre-processing was provided for topographic / hydrographical data as model inputs, modelling results were then presented as flood zone GIS-based maps. The following digital layers of city vector maps were processed using topographic (1:10 000) and thematic raster maps and remote sensing data: polygons of Dniester river water surface; streets and squares; parks and green areas; city quarters, buildings, streets and roads (with street names); gas stations; power lines. A digital map of city functional zoning was also prepared. A Digital Elevation Model (DEM) of Mohyliv-Podylskiy -Otaci site, including surface topography and river bathymetry, was developed using geodesic data (at scale 1:10 000) and special sonar survey of river topography performed by the project team in August 2011. The scenario of

extreme flood in July 2008 has been used for model verification and calibration. The floodmarks of streets inundated in 2008 were used together with the data from water gage station for model testing.

Modelling for the second selected site was delayed awaiting results of the survey of river topography. That has been completed, and one-dimensional modelling at Dubossary-Mayaki is to start shortly.

In the discussion that followed it was suggested that the new Operation rules for the Dniester Reservoir, currently under development and review, should take the findings of the study into consideration. A need for better intersectoral cooperation among different state agencies was also highlighted.

Integrated vulnerability assessment

Roman Corobov and Natalia Zakorchevna presented the concept for the study of integrated vulnerability assessment. This assessment which had just started was very important for determining especially vulnerable areas requiring priority action within the Dniester basin. Various related sectors would need to be involved in the vulnerability assessment for example through a workshop to be organized in Spring or Summer 2012. Participants recommended to keep the vulnerability assessment at a realistic level of detail and complexity, to ensure cooperation between different groups and the use of international experience and guidance.

In addition, Boris Minarik, IWAC, presented the methodology used in Slovakia for flood risk mapping which IWAC offers to use also in the Dniester III floods and climate project vulnerability assessment in collaboration with local experts from both countries.

Monitoring, information and communication

Representatives of UNEP (Nickolai Denisov) and the Dniester-Prut Basin Board on Water Management (Jan Dzyuba) presented plans for the installation of automated flow monitoring on the upper Dniester within the project. Locations for 2 hydrological gauges had been identified at Halich and Zalishchiki.

The working group was informed that since recently Ukraine had operated 3 similar automatic stations on the Siret and Prut rivers. The system includes an automatic alert system when certain flood thresholds are exceeded.

The working group discussed links with other similar projects, in particular the planned World Bank project to install 40 automatic hydrological monitoring stations on the Dniester and 20 in the Dnieper. Despite its importance the project is currently on hold due to ongoing negotiations between the World Bank, UkrHydroenergo and the Ministry for Emergency Situations. Many participants underlined the importance of this project and the need for close coordination of plans.

Moldova Hydrometeo (Ludmila Serenco) presented an update on plans for strengthening flow monitoring in the Republic of Moldova. The World Bank loan of 4.5 million USD had allowed purchasing of a limited number of flow stations (not too many so that they could be maintained afterwards), installation of Radar as well as an early-warning system to warn the population in case of floods. While information exchange with Romania was happening, no cooperation on this issue was currently occurring with Ukraine.

The working group stressed that the data from automated flow monitoring in Moldova in Ukraine need to be made available for both countries (i.a. Moldova's data would also be useful for the Odessa region of Ukraine, whereas the whole of Moldova would benefit from access to automated data in upstream Ukraine).

Project component on flood risk communication

Nickolai Denisov informed about the plans in relation to flood risk communication within the Dniester III floods and climate project, including a flood communication workshop and work on flood communication with 2-3 local communities. The work will start in 2012 and use experiences from other countries and WMO.

Two independent experts presented experience activities on flood risk communication in regions of Ukraine as inspiration for the activities to be carried out within the present project. One participant

informed the meeting about some of Ukraine's State Water Agency communication efforts, i.a. the distribution of 400,000 brochures to local communities which has led to positive changes seen during the most recent flood of 2010.

Some participants informed the meeting about other relevant material such as "Guidelines for forward-looking flood protection" prepared in Germany and 2 manuals published in the framework of the Global Water Partnership Central and Eastern Europe

Action plan for adaptation to climate change and flood risk management

UNECE informed the meeting about the planned development in 2012 of the action plan for adaptation to climate change and flood risk management. This would be based on the vulnerability assessment and had to be coordinated with the simultaneously ongoing development of national adaptation strategies.

Tamara Guvir (Moldova) informed about the development of the Moldovan climate change adaptation strategy in the framework of a UNDP project which was already rather advanced. Also in Ukraine a draft adaptation plan for 2012-2020 had already been prepared under the State Environmental Investment Agency of Ukraine, and forwarded to the Cabinet of Ministers. The plan is linked to the national plan for the development of water resources, and foresees the development of a national adaptation strategy.

International/ European projects and relevant activities

ECO-TIRAS presented its currently ongoing climate change projects and in particular the outcomes of the workshop on climate change organized by ECO-TIRAS on 18 November 2011 which could be useful also for the Dniester III floods and climate project.

The outcomes of the ENVSEC scenarios project were presented by Tamara Kutonova, OSCE. Finally, Sonja Koepfel presented the progress of other UNECE pilot projects under the Water Convention and the platform for exchanging experience, as well as the outcomes of the Astana Ministerial Conference "Environment for Europe" held on 21-23 September 2011 in Astana, Kazakhstan.

Possible follow-up of the project beyond 2012

The meeting concluded by discussing some options for follow-up activities of the project beyond 2012. The need was stressed to connect future activities to the river basin commission which is to be created once the Dniester basin agreement comes into force. It was highlighted that the measures to be proposed in the action plan at the end of the project needed to be implemented and integrated into national policies, which indeed would ideally require a longer-term institutional structure such as a river basin commission.

Other suggestions for follow-up included work on land management and spatial planning, improving the exchange of information, and focusing more on water quality and ecosystems issues. It was also proposed to focus in the future on downstream areas of the Dniester, for example calculations done for Mohyliv – Podilsky should be extended to Tiraspol and other areas. The need to calculate losses and risks as well as costing of adaptation measures was also highlighted.

Finally, a representative from the Republic of Moldova suggested to initiate a similar project on the Prut river basin.