



**Convention of the Protection and Use of
Transboundary Watercourses and International Lakes
Task force on water and climate
Fifth meeting
Geneva, Switzerland, 27 April 2012**

Progress of the pilot projects on adaptation to climate change in transboundary basins

The programme of pilot projects on adaptation to climate change in transboundary basins under the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) has started in 2010 and aims to:

- (a) Support countries and specifically countries with economies in transition (in Eastern Europe, Caucasus and Central Asia as well as in South-Eastern Europe) in their efforts to develop adaptation strategies and measures; in transboundary basins
- (b) Assist UNECE countries in implementing the Water Convention and the European Union (EU) Water Framework Directive (WFD) under conditions of a changing climate, also in light of the EU White Paper on adapting to climate change¹;
- (c) Create positive examples demonstrating the benefits of and possible mechanisms for transboundary cooperation in adaptation planning and implementation, also beyond the UNECE region;
- (d) Implement the Guidance on Water and Adaptation to Climate Change;
- (e) Provide a forum for exchange of experience, good practices and lessons learnt regarding adaptation projects in different parts of the region.

The following pilot projects² are supported directly by the UNECE secretariat in the framework of the Environment and Security Initiative (ENVSEC) and in cooperation with other ENVSEC partners such as the United Nations Development Programme (UNDP), the Organization for Security and Cooperation in Europe (OSCE) and the United Nations Environmental Programme (UNEP):

- a) Pilot project on the Chu Talas Basin, shared by Kazakhstan and Kyrgyzstan, implemented by UNDP and UNECE, in cooperation with OSCE,
- b) Pilot project on the Dniester Basin, shared by the Republic of Moldova and Ukraine, implemented by UNEP, UNECE and OSCE,
- c) Pilot project on the Sava river basin, shared by Bosnia and Herzegovina, Croatia, Serbia and Slovenia, implemented by the Sava River Basin Commission and UNECE,
- d) Pilot project on the Neman river basin, shared by Belarus, Lithuania and the Russian Federation

The following already ongoing activities have also been included in the programme of pilot projects:

- e) Activities regarding water and climate change adaptation in the Rhine basin, shared by Austria, Belgium, France, Germany, Italy, Liechtenstein, Luxemburg, the Netherlands and Switzerland, implemented by the International Commission for the Protection of the Rhine (ICPR),
- f) Project AMICE on the Meuse basin, shared by Belgium, France, Germany, Luxembourg, Netherlands, implemented by the "Établissement Public d'Aménagement de la Meuse" (EPAMA),
- g) The project "Dauria going dry" on the Amur/ Argun/ Daursky Biosphere reserve, shared by the Russian Federation, Mongolia and China, implemented by WWF Russian Federation,
- h) Activities on water and climate change on the Danube river basin, shared by Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Republic of Moldova, Romania, Serbia, Slovenia, Slovakia and Ukraine, implemented by the International Commission for the Protection of the Danube River (ICPDR).

The International Water Assessment Centre (IWAC) and the World Meteorological Organization (WMO) support the pilot projects programme.

In 2011, most projects finalized their baseline studies and started the impact assessment phase, including modelling, vulnerability assessment etc. Some of them are performing their own basin-wide modelling whereas others rather bring together, compare and adjust existing national studies, models etc. as well as vulnerability assessments.

¹ White paper - Adapting to climate change: towards a European framework for action.

² The pilot projects are funded mainly by Finland and Sweden. The platform for exchanging experience is also supported by the Netherlands, Germany and Switzerland.

In 2012, the pilot projects enter their final stage of development of an adaptation strategy in a transboundary manner

The following next stages are envisaged for the pilot projects programme:

2012	Implementation phase of the pilot projects: elaboration of a joint programme of measures
12-17 March 2012	Sixth World Water Forum, Marseille, France: presentation of the pilot projects programme
25-27 April 2012	Third workshop on water and adaptation to climate change in transboundary basins, back-to-back with the fifth meeting of the Task Force on Water and Climate Change: discussion on future work on water and climate change under the Water Convention
3-4 July 2012	Review of progress of pilot projects at the meeting of the Working Group on Integrated Water Resources Management : discussion and decision on next activities
28-30 November 2012	Sixth session of the Meeting of the Parties to the Water Convention: presentation of progress of pilot projects (possibly in a side event) and decision on future programme of work under the Water Convention
Feb. 2012	Meeting of the Core group of pilot projects

More information about the activities and progress of the pilots is included in the annex.

ANNEX: Description of each pilot project

A) Promoting Cooperation to Adapt to Climate Change in the Chu and Talas Transboundary Basin

1 **Pilot Project name:** Promoting cooperation to adapt to climate change in Chu-Talas transboundary basin
Aim of the project: The project aims to improve the adaptive capacity of Kazakhstan and Kyrgyzstan, to support dialogue and cooperation on the needed steps to design an adaptation strategy in the transboundary context and thereby prevent controversy on the use of water resources.

2 **Activities in 2011:**

The Inception phase of the project was implemented between March 2010 and August 2011. In this period, a background study was compiled in order to identify and assess already ongoing or completed projects and national and international initiatives as well as existing data and impact assessments. Consultations were held with all relevant partners and stakeholders to collect their comments and feedback on the study and align project activities with other ongoing initiatives. In May the study was presented to the Bilateral Chu-Talas Water Commission, and after the consultations round on July 12-13 the final version of the study was discussed and follow up activities for the implementation phase were discussed and confirmed with key stakeholders. A side event at the Astana Conference (Environment for Europe process) on climate change adaptation in transboundary basins has been held so the project activities were presented to a wider audience together with other pilot projects from the region. Currently modelling activities for climate change and hydrology are starting, discussing WEAP modelling and preparing the vulnerability report.

3 **Future planned activities:**

- Finalization of modelling in the first half of 2012
- Preparation of a vulnerability report and relevant adaptation measures for the joint Commission.
- Regular consultations and meetings with the stakeholders,
- Experience exchange with other pilot projects.
- Presentation of the results at the end of 2012.

Economic evaluation of adaptation measures, with the direct support of experts from Finland

4 **Challenges and lessons learnt:**

Different models and approaches are used for the 2nd national communication exercises in the two countries. In order to have harmonized data/messages a joint profile will be developed as well as scenarios and relevant modeling

- a) The lack of basin-wide climate change documentation and models – the same as above;
- b) A limited amount of available data – therefore we reviewed available resources at the background study and agreed on additional modeling/data collection; in coordination with the national-level processes in order to use harmonized approaches and to get relevant inputs.
- c) Rather narrow/technical mandate of the commission – therefore a wide engagement of stakeholders is planned for relevant consultations and meetings.

5 **Do you have any plans for continuation of your project beyond 2012? If yes which ideas do you have? How do you see the future of the platform and pilot projects programme under the UNECE Water Convention?**

The idea is that adaptation measures and relevant activities are to be integrated into the regular operations of the Bilateral Commission. However, if this wouldn't be possible or if any additional assistance is needed, the follow up will be aimed at continuing the process depending on the reached agreements and relevant requests from the countries.

With regard to the platform/pilot projects program, the project would probably wish for the engagement of other basins, expanding the partnership and attracting relevant expertise from other regions and organizations To meet project-related challenges (for example, for this particular project – economic evaluation of related CC impacts and relevant adaptation measures, costs-benefit ratio) the project would wish for filling up the platform with relevant documentation and linking it up with other sources of information.

6 **Contact persons:**

UNECE: Sonja Koeppel, Secretariat of the UNECE Water Convention,
sonja.koeppel@unece.org, +41 22 917 1218;

UNDP: Natalia Alexeeva, Water Programme Coordinator for Central Asia,
natalia.alexeeva@undp.org, +7 727 2582643 ext. 1501

B) Reducing vulnerability to extreme floods and climate change in the Dniester river basin

1 Pilot Project name: Reducing vulnerability to extreme floods and climate change in the Dniester river basin

Aim of the project: The project aims to reduce risks from climate change - and specifically flooding - for security by improving the adaptive capacity of Ukraine and the Republic of Moldova. More specifically, the project aims to expand and further strengthen cooperative management in the Dniester River basin to address cross-border management of floods, taking into account both current climate variability and long-term impacts of climate change on flood risks.

2 Activities in 201/2012: Please describe shortly your activities and achievements during the year adding relevant links if appropriate

An expert meeting was held in March 2011 in Bratislava, Slovakia, hosted by the International Water Assessment centre (IWAC) which allowed discussing the exact activities on modelling and vulnerability assessment within the project. These were presented and discussed at the third meeting of the working group on flood management and climate change adaptation, held in April 2011 in Chisinau, Moldova.

Subsequently, during 2011 activities have been focused on fulfilment of work under following tasks:

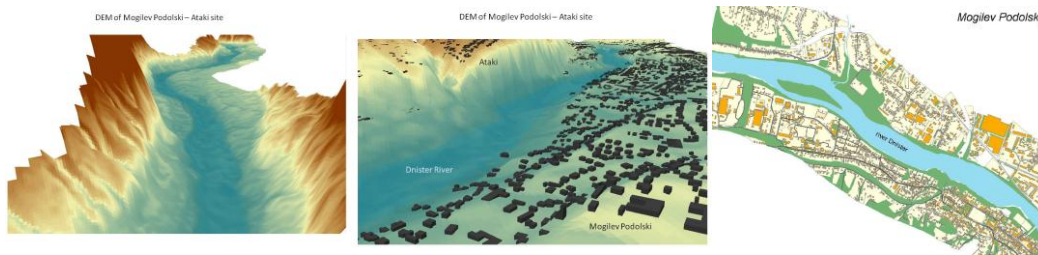
1. Analysis and projections of climate change in the Dniester basin.
2. Analysis of the impact of climate change on Dniester water resources.
3. Vulnerability assessment, scenarios and flood risk modelling

Observation hydrological and meteorological data were collected for Moldovan and Ukrainian parts of the Dniester Basin. This set of data was further used for models calibration and forecasting calculations. Ensemble of seven climatic models including Regional Climatic Models (RCM) and Atmospheric and Ocean Global Circulation Models (AOGCM) was applied in order to obtain predicted values of temperature and precipitation changes for 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 brought to conclusion that regional model REMO provides the best results either for all delineated regions or for entire Dniester Basin. Retrospective analysis of severe meteorological events has been performed on the basis of observation data obtained at meteorostations within Dniester Basin. All data including primary one and results of calculations are included in developed databases.

Analysis of multiyear dynamic of annual mean, maximal and minimal water discharge in the Dniester basin is performed based on observation data on selected subbasins-indicators as well as for some observation stations located directly on the Dniester river. Assessment of stationarity of multiyear fluctuations of mean, maximal and minimal water discharge is done based on assessment of linear trends significance. Low water and high water periods were identified using difference-integral curves. Adaptation of hydrological module NAM of Rainfall-Runoff MIKE 11 model is completed for five catchments-indicators. Hindcasting modeling compared with measured data for 1971-2000 for five catchments is performed based on climatic parameters given by REMO model according A1B scenario for 1971-2000 and projection of changes in river flow in the 2021-2050 periods is simulated.

After careful consideration two sites: "Mohyliv-Podylskiy- Ataki" in Ukraine and Moldova and "Dubossary NPP (Moldova) downstream till Mayaki (Ukraine)" were approved for flood risk modelling/mapping study during April 2011 Project meeting. Floodplain inundation at Mohyliv-Podylskiy-Ataki during historical and projected extreme floods scenarios is simulated on the base of the contemporary 2D model COASTOX –UN based on the numerical solution of shallow water equations on unstructured grid. The GIS pre-processing was provided for the input topographical/hydrographical data preparation for the model input and the technology of the post-processing of the modelling results for flood zones presentation on the GIS maps for flood zoning was customised for the site. As results the following digital layers of city vector maps Mohyliv-Podylskiy - Ataki site in the shape ESRI format using results of topographical (scale 1:10 000) and thematic raster maps vectorization, remote sensing data were processed: the polygons of Dniester river water surface, streets and squares, parks and green zone's objects, city quarters, buildings, lines of streets and roads (with names of the streets), points of gas stations, points of power lines. The digital map of city functional zoning was elaborated. The Digital Elevation Model (DEM) of Mohyliv-Podylskiy -Atacki site including surface topography and river bathymetry was developed using geodesic data (scale 1:10 000) and special sonar survey of the river topography, provided by the project team in August 2011. The merging DEM as ESRI raster model for the Mohyliv-Podylskiy -Atacki site has been done. The scenario of extreme flood, July 2008 that caused hazardous flooding of the riverside areas of Mohyliv-Podylskiy has been used for model verification and calibration. The floodmarks of the inundated in 2008 streets have been collected and GIS processed to

be used together with the data from the city's water gage station for model testing. The dynamics of floodplain inundation during 2008 flood has been simulated and compared with the measured data. The technology of the GIS post-processing for the site has been tested for the scenario of the flood 2008



For the site Dubossary NPP in Moldova downstream till Mayaki (Ukraine) the river cross-section data that are required for the planning 1-D model implementation are collecting in Republic of Moldova.

In addition, work on the vulnerability assessment report has started in the second half of 2011. In December 2011–March 2012, the work on vulnerability assessment aimed to:

- To develop the principal structure of the assessment of basin water vulnerability based on its three components: *exposure*, *sensitivity* and *adaptation potential*.
- To assess physic-geographical aspects of the basin vulnerability, including the transformation of current and expected climatic variables into exposure to possible impacts on natural and social systems;
- To assess sensitivity to climate variability and change of the Dniester basin's ecosystems with emphasis on the Carpathians forests, Low Dniester wetlands and Dniester's ichthyofauna;
- To assess sensitivity of surface water resources based on its current use and expected availability, including water quality and access of local population to safe water;
- To assess the adaptation potential of Dniester riparian countries (Moldova and Ukraine) based on their macroeconomic development, situation in agriculture, infrastructure, social security, public health, education, and so on.

Where necessary information was available, all assessments had been carried out at the basin level. The main challenge in dealing at this level is inconsistency of two countries' national information by its content and administrative resolution (oblasts in Ukraine vs. rayons in Moldova). The outputs are presented both in a text form, illustrated by tables and figures, and maps.

To describe the spatial distribution of vulnerability, there were calculated vulnerability indexes at a sub-basin (rayon) level for Moldavian part of the basin. This product is considered as a case study for a possible discussion at the workshop.

3 Future planned activities: *Please describe the activities that you plan until end of 2012*

Future activities under Tasks 1 and 2 will include:

- obtaining values of maximal precipitation using RCM;
- obtaining forecasted characteristics for severe meteorological events in Dniester Basin;
- finalising of hydrological modelling for additional three catchments (subbasins).
- based on the modeling of potential Dniester floods (Task 2's outputs), to estimate the exposition to and possible consequences from such floods for economy, population, assets, etc.

Under Task 3 future activities will include:

- finalising of the model tuning/calibration for the new data on the flooding in 2008 in Mohyliv-Podylskiy
- preparation of the extreme floods input scenarios for climate change projections for the water gage station Zalischiki (inflow to Dniestrovaska HPP Reservoir) on the basis of the results of Task 2 regarding the assessment of the intensity of the flood generating highest rainstorms in the upper part of the Dniester basin, and using management rules of Dniestrovaska HPP reservoir
- model/GIS based analysed of the Mohyliv-Podylskiy site flooding and flood vulnerability for the extreme flood scenarios taking into account climate change projections
- 1-D modelling of extreme floods routing and dams overtopping downstream Dubossary HPP

Additional planned project activities include:

- Vulnerability assessment for the entire Dniester basin
- Improved / new automated flow monitoring stations (4 to 6) and data exchange infrastructure
- Enhanced capacities and plans for flood risk communication on the sub-basin / local level
- Agreement and planning of further measures for flood risk reduction

- 4 **Challenges and lessons learnt:** *Which difficulties did you encounter and how did you overcome them? What lessons did you learn this year, which advice could you give to other projects? Did you adapt your project on the basis of the lessons learnt?*

The biggest challenge was dealt with observation data sets collection. At the same time modelling calculations and respective hydrological calculations appeared to be quite time consuming. We would suggest for other similar projects to secure enough time for data preparation and subsequent calculations. Also attention should be paid to existing data formats especially in a case of developing databases.

The hydrographical data collections during the river surveys should be better prepared by the partner countries to avoid situation such as we met in August 2008 when sonar survey of the bathymetry at Mogilev Podolsky was permitted for the project team by the border guards only in Ukrainian waters.

- 5 **Do you have any plans for continuation of your project beyond 2012? If yes which ideas do you have? How do you see the future of the platform and pilot projects programme under the UNECE Water Convention?**

Plans needed to be discussed with partners since final outcomes of the project are not clearly visible yet.

- 6 **Contact persons:**

Yurii Nabyvanets (Ukraine)
Lyudmila Serenko (Republic of Moldova)
Mark Zheleznyak (Ukraine)
Roman Corobov (Republic of Moldova)
Sonja Koeppel, UNECE
Nickola Denisov, UNEP/Zoi
Tamara Kutonova, OSCE

C) Building the link between flood risk management planning and climate change assessment in the Sava River Basin

- 1 **Pilot Project name:** “Pilot project on climate change adaptation: Building the link between the Flood Risk Management planning and climate change assessment in the Sava River Basin”

Aim of the project: The project aims to address, through expanded and strengthened collaboration among the countries in the Sava River Basin, issues of transboundary management of floods, taking into account the impacts of climate change under different scenarios and the perspective adaptation measures envisaged.

- 2 **Activities in 2011:**

The implementation of the project started in March 2011, when the six activities (**A1, A2, A4, A6, A7 and A8**) out of eight have been contracted, with the main objective of the **preparation of the *Program for development of the Flood Risk Management Plan (FRMP) for the Sava River Basin***. (hereinafter: *the Program*)

In order to initiate the discussion on all issues relevant for the development of the Sava FRM Plan and to set up a basis for preparation of the *Program*, the **1st Consultation workshop** has been held in May 2011 in Zagreb, where the representatives of the institutions competent for flood management from all the four Parties to the Framework Agreement on the Sava River Basin (FASRB), as well as the members of the Permanent Expert Group for Flood Protection (PEG FP) of the International Sava River Basin Commission (ISRBC) participated.

The first deliverables – reports on the activities

1. **A1 – Overview of the already completed or ongoing activities and their findings regarding FRM planning in the Sava River Basin** and
2. **A2 – Identification and assessment of existing legislation, strategies and plans related to the FRM planning and climate change (transboundary and national)**, prepared by a consultant, have been accomplished.

The preparatory activities for the development of the *Sava FRMP* were intensified in 2012, so the draft *Program* has been developed and discussed at the PEG FP meeting in January 2012.

Further on, the draft report on the **initial assessment of the vulnerability to floods in the Sava River Basin** has been presented and discussed by the Group.

The tender procedure for the remaining two activities related to the climate change has been conducted. The implementation of the activity **A3 – elaboration of the existing climate change scenarios for the region, their expected impacts on water cycle and more specifically on the frequency and magnitude of extreme flood events in the Sava River Basin**, is starting.

- 3 **Future planned activities:**

The **2nd Consultation workshop** where the final draft *Program* will be proposed and put up for discussion with relevant stakeholders from the Sava River Basin and the PEG FP is planned for May 2012, tentatively.

Assessment of data and information needs for the preparation of the joint FRMP for the Sava River Basin (hydrological data, socio-economic data, environmental data, state of infrastructure), data gaps, defining strategy how to obtain it (**activity A7**) will be an important topic for discussion, too. As a part of the second assignment, related to the climate change, in the framework of the activity **A6**, an **assessment whether additional modelling of climate change impact on flood vulnerability is needed**, will be performed. In follow, based on the initial vulnerability assessment and the elaboration of the climate change scenarios, a preliminary identification and description of possible adaptation measures will be conducted in order to present them and propose to a wide scope of stakeholders from the Sava River Basin at the **workshop in September 2012** and put to discussion. Accordingly, the final reports are to be concluded up to the end of the project by end of December 2012.

- 4 **Challenges and lessons learnt:**

- Challenges / possible obstacles to implementation
 - Differences between the countries
 - Status with respect to EU & eligibility for approaching funds
 - Level of economic development (financial resources)

- Organizational structure in decision-making process
- Environmental awareness of the public
- Financing priority projects / strategic studies, establishment of integrated systems
- Resolving conflicts of interests of different users of water (within a country / between countries / climate change)
- Different legal capacity of the ISRBC in the fields of Navigation and Water Management
- Number of official languages of the ISRBC
- Lessons learned
 - Data collection is a challenge
 - Local knowledge and engagement of local experts is extremely important for successful implementation of the projects
 - Steering of the projects is essential
 - Being done by Expert Groups of the ISRBC (Flood Prevention, Hydro-Meteorological Issues, River Basin Management)
 - Sufficient level of expertise is provided
 - Representation of all beneficiary countries is ensured

5 Do you have any plans for continuation of your project beyond 2012? If yes which ideas do you have? How do you see the future of the platform and pilot projects programme under the UNECE Water Convention?

It is expected that by a successful accomplishing of the tasks proposed by this project, several important issues and further steps related to the integrated transboundary FRM in the SRB will arise, to be followed. Nevertheless, the development of the **FRMP for the Sava Rive Basin** according to the **Program** will be the next general task. Data gaps, harmonization, adaptation measures are some of the issues which will remain open also for further development.

The programme of pilot projects, together with the platform for exchange of experiences presents a very good impulse and a valuable tool for promotion of the cooperation in the transboundary basins in South-Eastern Europe, Eastern Europe, Caucasus and Central Asia which should be continued and serve as a source of information, as well as a positive example of cooperation and information exchange for the future initiatives.

6 Contact persons:

Janja Zlatić-Jugović, Dragan Zeljko, Dejan Komatina

D) Pilot project on river basin management and climate change adaptation in the Neman river basin

1 Pilot Project name: PILOT PROJECT ON RIVER BASIN MANAGEMENT AND CLIMATE CHANGE ADAPTATION IN THE NEMAN RIVER BASIN

Aim of the project: The overall objective of the project is to improve integrated river basin management and transboundary cooperation in times of a changing climate in the Neman river basin. The project aims to strengthen the capacity to adapt to climate change of the countries sharing the Neman river through supporting dialogue and cooperation on the needed steps to design an adaptation strategy in the transboundary context. It will aim to reach a common understanding on future water availability and water use taking into account possible climate change impacts.

2 Activities in 2011:

1. Scientific material done while implementing WFD in Lithuania translated into English and Russian.
2. Meeting 15-16 February 2011, Geneva:
 - The project presented for the participants from other pilot project;
 - Further process of the project discussed in more detail;
 - The content of baseline study agreed;
 - Next activities in the project discussed and agreed;
3. Expert Meeting 3-4 August 2011, Bratislava, hosted by IWAC:
 - Outcomes of the baseline study presented;
 - Slovakia's experience in modeling and scenario-selection/ building as well as vulnerability assessment shared;
 - Environmental analysis done while implementing WFD in Lithuania presented;
 - Climate Change analysis in the Lithuanian part of the Neman/Nemunas basin presented;
 - Next activities in the project discussed and agreed;
4. Meeting 27-28 October 2011, Vilnius:
 - Evaluation of changes in hydrological and meteorological regime of Neman/ Nemunas river, climate projections, water balance models presented (from both sides - Lithuania and Belarus);
 - Suggestion about climate change assessment models and scenarios with using the experience of Vilnius University in downscaling IPCC scenarios A1B and B1 with the help of regional CLM models (based on EHAM outputs);
 - General discussion on common parameters and approaches for basin-wide environmental analysis and further steps of the project proceeded;
 - Next activities in the project discussed and agreed.
5. Meeting 23-24 November 2011, Geneva:
 - Presentation of the main results of baseline study;
 - Discussion about future activities and further steps of the project proceeded up to April 2012
6. Meeting 06 March, Grodno with discussion about:
 - Outcomes of baseline study;
 - Environmental assessment of the Neman basin including results of activities regarding meteorological and hydrological data collection, proceeding, trends analysis and mapping of results;
 - Assessment of the future run-off under conditions of climate change as well as different scenarios for socio-economic development;
 - Assessment of climate change impacts on water quality and the optimization of monitoring;
 - Other relevant projects and opportunities for cooperation;
 - Conclusions and next steps in the project.

Activities in 2012:

1. Assessment of the current state of the water resources of the Niemen River basin (quantitative aspects) (up to April 2012):
 - Meteorological and hydrological data collection and pre-proceeding (data from 1961 to 2010);
 - Statistical analysis and elaboration of meteorological and hydrological characteristics changes trends;
 - Study of the change of the climatic characteristics from 1961 to 2010 and elaboration of the climate change scenarios;
 - Assessment of the future climate change and forecast until 2035 (mean value of 2021-2050) via calculation of change of meteorological characteristics due to selected

- scenarios A1B and B1 with using CCLM –Model (based on EHAM outputs);
- Preliminary forecasting of runoff changes in the Niemen River basin in the context of climate change;
- Preparation a series of basin-wide maps regarding evaluation of changes in meteorological and hydrological regime in the river basin from 1961 to 2010 and draft version of maps regarding forecast of these regimes until 2035.

3 Future planned activities:

Activities:

1. Forecasting the runoff of the Niemen River basin in the context of climate change and with account of different scenarios for water use and socio-economic development
2. Analysis of the hydrometeorological, hydrochemical and hydrobiological monitoring systems in the Niemen River transboundary basin and assessment of the needs for these systems optimization for climate change monitoring (including emergency cases)
3. Estimation and forecast of the future climate change impact on the water quality
4. Elaboration of the common information platform (Internet database), containing data on water resources management and adaptation to climate change for the Niemen River basin countries and final report on Project including recommendations for the improvement of the water management in the Nieman River Basin with account of adaptation to climate change

Communication and field study:

1. Expert meeting (Kaliningrad, Russian Federation (tbc), July 2012)
2. Field study in the Niemen River Basin with participation of international consultants including sampling and their analysis
3. Discussions of recommendations and adaptation measures:
 - Workshop with participation of stakeholders for participatory analysis of the impacts of projected changes in run-off on various socio-economic sectors (October 2012);
 - Presentation and discussion about main project results and about recommendation for improvement of water management in connection with climate change adaptation (early 2013).

1.

6 Contact persons:

Mr. Audrius Sepikas, Environment Protection Agency, Lithuania

Tel: +370 5 266 28 15, E-mail: a.sepikas@aaa.am.lt

Mr. Vladimir Korneev, Central Research Institute for Complex Use of Water Resources, Belarus

Tel: +375 17 263 4833, E-mail: v_korn@rambler.ru

E) Jointly developing a transboundary climate change impact assessment in the Rhine

1 **Pilot Project name:** Jointly developing a transboundary climate change impact assessment in the Rhine

Aim of the project: The project aims to draft a scenario study for the flow regime of the Rhine to assess the impacts of the modification of the climate on the hydrological processes and the regime of the Rhine.

2 **Activities in 2011/2012:**

- The results of the second step, a "[Study of Scenarios for the Discharge Regime of the Rhine](#)", has been published in 2011.
- Assessment of the impacts on quality status and uses (2011-2013)
- Identification of possibilities to remediate impacts (2012-2013)
- The discussion on possible effects of changes in the hydrology on e.g. concentrations and ecology has been started up.

3 **Future planned activities:**

To further the discussion on the Adaptation Strategy, a workshop is being planned to take place in first half of 2013. The eventual adaptation strategy will in any case take account of experience gained with implementing the 1998 Flood Action Plan as well as the wider experience of the ICPR in protecting the Rhine. In particular synergies between flood protection and ecosystem and water quality improvements will be sought wherever possible, and problems, for e.g. drinking water supply and navigation due to low water levels, will also be addressed.

Study into possible effects of changes in the hydrology of the Rhine on e.g. concentrations and ecology as a basis for discussion on adaptation.

4 **Challenges and lessons learnt:**

5 **Do you have any plans for continuation of your project beyond 2012? If yes which ideas do you have? How do you see the future of the platform and pilot projects programme under the UNECE Water Convention?**

Discussion on adaptation will most probably continue beyond 2012.

6 **Contact persons:**

Mr Ben van de Wetering, International Commission for the Protection of the Rhine
ben.vandewetering@iksr.de

F) AMICE: Adaptation of the Meuse to the Impacts of Climate Evolutions

1 Pilot Project name: AMICE (Adaptation of the Meuse to the Impact of Climate Evolutions)

Aim of the project: The project is a unifying force in the Meuse basin, which stretches 950 km from the Langres plateau to Rotterdam. The 17 partner organisations (six river basin managers, six universities and research centres, three public administrations, and an NGO crisis centre) in the river catchment are all working on building a single overall strategy which requires reviewing, testing and quantifying. The partners are working towards a flood-proof, drought-proof understanding of how the Meuse will respond in the future to extreme water events.

2 Activities in 2011:

- The hydraulic modelling of the river Meuse from spring to mouth was finished. The report was published in English and summaries in English, Dutch, German and French are available. The papers describe the methodology to run a full modeling of the Meuse river from spring to mouth and present results at the basin scale as well as on a selected number of hotspots. See <http://www.amice-project.eu/en/news.php?refactu=67>

The next action consists in a quantification of the impacts of future floods and low flows on the economy in the transnational Meuse Basin. Partners developed a common methodology to be able to compare the flood damage costs: this combines land-use from the CORINE database, flood extents, common damage functions and national asset values. By 2050, the highest floods would still be manageable, but by 2100, they would overtop the dike systems and generate major losses.

Low-flows is a newer threat. Impact on crops (wheat, corn and barley) has been calculated, as well as impacts on energy production (both nuclear and hydropower). The costs on inland navigation is harder to evaluate and the drinking water sector seems to be the less threatened by climate change in the Meuse basin.

- AMICE's interactive documentary and website is ready and can be seen in FR, NL and DE at www.amice-film.eu

- Works at the Steenbergse Vliet are finished. The change of pure agricultural land into wetland enables such multifunctional developments as combinations of: water storage, recreation, housing in flood plains, restoration and reinforcing of historical monuments and the landscape.

In order to inform visitors, POI's (Points Of Interest) along the Vliet and in Steenberg city are created. The information can be gathered by modern mobile telephones equipped with Internet, ANDROID and APPS to view the information on cultural history, water management in the past, present and future; history of the town of Steenberg; recreational development in historical places. For more information <http://www.amice-project.eu/en/news.php?refactu=65>

- In November, AMICE's Transnational flood crisis management exercise took place in France and Wallonia. More than 300 persons were involved. It was a good opportunity to check emergency processes, to list information shared between countries, to test innovative tools such as 3D maps, decision-support software for emergency management, information sharing via smartphones. See <http://www.amice-project.eu/en/news.php?refactu=82> and <http://www.amice-project.eu/en/news.php?refactu=72> for more information.

3 Future planned activities:

Climate check of existing measures in water management and elaboration of a concerted strategy of adaptation to climate change in the international Meuse Basin is online and will be analyzed in 2012;

- The climate adaptation strategy for the Meuse will be developed. Two workshops are planned in May and June with the decision makers from all 4 countries. The AMICE results and experience will be integrated with the other activities going on in the basin in order to identify best practices as well as a shared strategy for the future.

- Investments:

- first pumps on a sluice on the Albert Canal will be functioning by autumn 2012;
- works in the community of Hotton will be ready: they include restoration works on a small river and the enhancing of the water storage capacity of a wetland, in collaboration with local stakeholders;
- a plan for a better management of the Rur dams systems in relation to the expected impacts of climate change will be ready;
- works in 's Hertogenbosch (inlet of the HOWABO storage) will be finished;

- The reports on the different investments will be ready. There are 3 natural water retention investments and 3 more 'technical' projects. We plan to have a report per group. Apart from general findings, there will also be focus on best practices, managing uncertainty and experience on communication.

- The AMICE final international conference is now planned for March 13th-15th 2013

4 Challenges and lessons learnt:

- International cooperation, however sincerely wanted by all of the partners, is not always easy as in some cases political blocks occurred which are difficult to overcome (new priorities defined in the Partners' organisations limit their time available for AMICE);
- It is useful to involve many stakeholders (17 partners in the AMICE-project), but this leads to challenges in coordination and communication. Some Partners also faced difficulties with their local stakeholders;
- It is uncertain whether AMICE's recommendations will be implemented after the project ends, for example by the International Meuse Commission and by the different countries; the Partnership's intention is to build a follow-up to AMICE
- Financial incentives are a powerful mean to get stakeholders involved but the world's financial situation limits the possibilities;
- Managing uncertainties related to climate change projections is hard to achieve when designing water works. Politicians tend to request 0% damage and at a reasonable cost. The notions of vulnerability and probability of occurrence are hard to explain. Investments that combine water management with other challenges such as biodiversity conservation, sustainable urban development or tourism are better accepted. Investments that are flexible enough to cope with a wide range of future climates are promoted.

5 Do you have any plans for continuation of your project beyond 2012? If yes which ideas do you have? How do you see the future of the platform and pilot projects programme under the UNECE Water Convention?

We're thinking about an eventual " AMICE 2 ". During our last Project Steering Group, we organised a first brainstorm in order to gather views and ideas from the Partners. This proved to be useful: all of the participants had ideas for further collaboration along the river Meuse. Some of these were rather concrete, while others stayed at a conceptual level and will need further discussions. Topics mentioned by the partners include: Water quality modelling with regard to climate change; a common data platform which combines several (national) data bases; establishing a clearer link drought – agriculture, culture, economy; making a blueprint for climate adaptation; open up to other sectors and other actors, especially transnational, linked to the Meuse: tourism, culture, economy,; morphodynamics and impact of shipping, drinking water industry, ecology and climate change; intrusion of salt water.

I suppose we're not the only projects thinking about/struggling with these topics. If an AMICE 2 ever comes through, contacts and exchange of experience with other river basin based project is of invaluable importance. UNECE's core group as a platform with just one (or two) opportunities a year to meeting each other is just perfect.

6 Contact persons:

Martine Lejeune, communication officer: m.lejeune@telenet.be
Maïté Fournier, project coordinator: maite.fournier@epama.fr

G) Dauria Going Dry: adaptation to climate change in transboundary headwaters of the Amur River Basin

1 Pilot Project name: Dauria Going Dry: adaptation to climate change in transboundary headwaters of the Amur River Basin

Aim of the project: The project seeks to develop and promote science-based adaptation measures to complex cycling climate of Dauria region, which is severely affected by global warming. The project addresses domestic and international policy-making, as well as selected conservation and monitoring practices in the field. It is also planned to create a platform for scientists from interested countries to advance understanding of dynamics in Dauria ecosystems under climatic and anthropogenic influences.

2 Activities in 2011:

Monitoring network

The formation of an ecosystems monitoring network was completed in the transboundary part of Argun and Onon rivers and Torey lakes basins. The network includes more than 200 wetland and steppe monitoring plots and transects in Russian, Mongolian and Chinese parts. In collaboration with the Institute of Natural Resources, Ecology and Cryology of Russian Academy of Sciences hydrochemical and hydrobiological field, studies at 11 lakes of the basins were carried out.

1. The ecosystem monitoring system formation is in progress:

- digital monitoring database for 2010-2011 was compiled for such fields of study as “general conditions of waterbodies” and “bird monitoring”;
- the database for vegetation monitoring of Argun floodplain was compiled;
- for the multiyear (since 2002) vegetation monitoring transect between Torey Lakes the data for 2010-2011 were analysed;
- vegetation cover dynamics in 2010-2011 in Mongolian part of Torey Lakes basin was analysed.

2. The results of water- and shorebirds monitoring were used for the justification of decision of Zabaikalsky government to ban water-bird hunting in spring season.

3. The first report on the results of “Dauria going dry” project was prepared for publication

4. The first international (Russian-Mongolian-German) working meeting with participation of IUCN representatives on Russian-Mongolian nomination of World Heritage Property “Landscapes of Dauria” preparation was held (Chita, Russia, February, 2012)

5. New national wildlife refuge “The Gazelle Valley” was established in accordance with the Plan of protected areas network adaptation to dynamics of landscapes and biota under natural climate fluctuations.

Hydrometeorological data for the entire period of instrumental observation were obtained and are available for needs of the pilot project. An agreement with WWF Mongolia for complex monitoring (climate, hydrology, biota, human activities) of Uldz river basin as a model basin with natural flow was achieved. Complex ecosystem monitoring will make possible understanding of natural and anthropogenic processes in the basin and the estimation of the natural and human contribution to the landscape dynamics. It will give information for developing a climate adaptation strategy and can be the tool for controlling of its realization. Within the framework of the improvement of collecting information, a training seminar on environmental analysis of botanical data was held in the Daursky reserve.

The activities of the 2011 were supported by WWF Russia.

The project expert was invited by UN-Habitat for the Expert Group Meeting “Designing low-carbon sustainable Urban development in Northeast Asia’s largest wetlands” (E’erguna, Inner Mongolia, China). Participation in the meeting provided an opportunity of assessment of the development plan from the position of our findings in the field of climate adaptation and wetlands protection.

Research papers

Results of long-term investigations of concordant climate and biota changes in Daurian region were colligated and published in a chapter of book “Eurasian Steppes” (V.E.Kirilyuk, V.A. Obyazov, T.E. Tkachuk, O.K. Kirilyuk Influence of climate change on wildlife in the Daurian ecoregion // Eurasian Steppes --- Ecological Problems and Livelihoods in a Changing World” edited by Marinus J.A. Werger & Marja A. Van Staalduinen. Published by Springer, (Dordrecht, Berlin, Tokyo, Boston, London), 400-470p.) A structure was developed and authors were selected for the Report on the 1st Stage of the Pilot Project “Dauria Going Dry” devoted to environmental problems of Dauria rivers (in English)

At the request of the Amur Water Management Authority we conducted a review on the 1st part of the Report on Situation at the Argun River prepared by Moscow State University. The report contains analysis of practices of environmental flows and ecological consequences of water-flow regulation at Argun/Hailaer river.

Our representative took part in an official Russian inspection of the Hailaer river-Dalai-lake Water

Transfer Canal and developed report recommendations on the outcomes. It was the first case of such international inspection between Russia and China. The inspection has shown that the China water authority is ready to take measures to limit water-transfer volume but is not ready to tolerate international control and to monitoring ecological consequences of the water-transfer.

Policy of water transfer from Halhingol (Halahahe) river in China was analyzed (see: <http://arguncrisis.ru/gossovet-knr-gotovit-vstrechnuyu-perebrosku-transgranichnyx-vod-sever-yug/>). Water management plans at Kherlen River basin (Mongolia), including dam building and water transfer to Gobi desert, were examined, and an expedition to proposed dam sites on Kherlen River was carried out. Preparations to environmental impact assessment and to alternatives evaluation had begun (for details see <http://arguncrisis.ru/kerulen-vizit-na-mesto-kazni/>). Daursky Biosphere reserve with coalition “Rivers without boundaries” and Mongolian NGOs have begun monitoring of mining influence on ecosystems in Onon and Uldz river basins. The Government of Germany gave funds for working out the Russian-Mongolian nomination of UNESCO World Natural Heritage Site “Daurian Steppe” which includes transboundary watersheds of Torey lakes and Uldz River.

Public outreach:

Information website DAURIARIVERS.ORG proceeds successfully and provides the interested audience with a wide spectrum of information on the situation of our transboundary watersheds. Chinese Project partners have employed a special staff for the Argun River Project. The weekly monitoring of information concerning Argun and Amur basins and the production of a Chinese media digest issue was established.

3 **Future planned activities:**

1. Summarizing report on the 1st stage of the pilot project on the ecological problems of Dauria rivers basins (in English)
2. Elaborating program of complex ecosystem monitoring in the Uldz river basin and co-operation with UNDP project on climate adaptation starting in Mongolia.
3. Analysis of the first years data from the created monitoring network.
4. Issue of the newsletter devoted to regional ecosystem monitoring
5. Searching for partners
6. Fundraising

Challenges and lessons learnt:

1. The most serious obstacles we were faced with were misunderstanding and lack of environmental thinking among Chinese authorities.
2. Organizing the Nature Protected Area at the boundary segment of Argun river is hampered by failure to understanding the local communities shortages and the adventures it gives them.
3. Popularization of the project is necessary for better understanding from local people and authorities.
4. The project primary management must be as thought-out and detailed as possible.

5 **Do you have any plans for continuation of your project beyond 2012? If yes which ideas do you have? How do you see the future of the platform and pilot projects programme under the UNECE Water Convention?**

1. Continuing monitoring of ecosystems as a basis for elaborating recommendations on adaptations of human activities to climate and landscape dynamics and as the means of controlling developing situation.
2. Annual issue of the newsletter on monitoring results (in Russian)
3. Expanding of international participation in the ecosystem monitoring in the transboundary basins.
4. Working out recommendations on climate adaptation of human activities in Dauria transboundary basins.
5. Continuing work on establishment of Nature Protected area at the boundary segment of Argun river as the key mechanism of harmonizing environmental situation in the basin
6. Fundraising

Developing trilateral world heritage site “Dauria Steppes”

6 **Contact persons:**

Dr.V.Kiriliuk, Daursky Biosphere reserve (DIPA) vkiriliuk@bk.ru
Dr. E.Simonov, Consulant to WWF Amur Programme, simonov@riverswithoutboundaries.org
Dr.T. Tkachuk, Daursky Biosphere reserve (DIPA) tetkachuk@yandex.ru
Dr. O.Kiriliuk, Daursky Biosphere reserve (DIPA) kiriliuko@bk.ru

H) Development of the ICPDR Adaptation Strategy for the Danube River Basin

1 Pilot Project name: ICPDR Danube Climate Adaptation Strategy

Aim of the project: The project seeks to develop a Climate Change Adaptation Strategy for the Danube River Basin. This strategy should be based on a step-by-step approach and encompass an overview of relevant research and data collection, a vulnerability assessment, ensure that measures and projects are climate proof respectively “no regret measures” and ensure that climate adaptation issues are fully integrated in the second Danube River Basin Management Plan in 2015.

2 Activities in 2011/beginning 2012:

The ICPDR is a transnational body established by the Danube River Protection Convention, comprising as contracting parties 14 Danube countries and the European Union. The ICPDR is charged with coordinating the trans-boundary aspects for the implementation of the EU Water Framework Directive (WFD) as well as the European Floods Directive (EFD) in the Danube River Basin. At the Ministerial Meeting in February 2010, the Ministers of the Danube countries asked the ICPDR to develop until the end of 2012 a Climate Adaptation Strategy for the Danube River Basin what is also supported in the frame of the EU Strategy for the Danube Region.

Germany was nominated as Lead Country in the frame of the ICPDR on this activity and a Team of Experts was established, working on the issue. Providing a basis for the discussions on the Strategy, a **Danube Climate Adaptation Study**, developed by the University of Munich, was **finalised in January 2012**. The study is based on already existing research and development projects. No new modelling was carried out but the study summarises and assesses all relevant available information and provides the main knowledge base for the elaboration of the Danube Climate Adaptation Strategy by the end of 2012. The study can be downloaded from the ICPDR website following the link: http://www.icpdr.org/icpdr-pages/climate_adaptation_study.htm

Furthermore, on 29-30 March 2012, the Danube Climate Adaptation Workshop was organised in Munich (DE), where the study results, case studies on adaptation activities and the main elements of the Danube Climate Adaptation Strategy were discussed what was an important step towards the elaboration of the Adaptation Strategy.

3 Future planned activities:

- Elaboration of Danube Climate Adaptation Strategy during 2012 with involvement of different expert groups, stakeholders and NGOs active as observers in the frame of the ICPDR
-

4 Challenges and lessons learnt:

- The elaboration of a knowledge base on expected future changes is a key step towards adaptation
- Further research will increase the knowledge base but uncertainties will remain
- Despite existing uncertainties, actions are required to adapt to climate change
- Due to the cross sectoral nature of water, the integration of different sectors in climate adaptation activities is important but also imposes a challenge in the practical implementation
- Different levels exist where actions are needed - coherent adaptation activities have to take place on local, national and international level, imposing an additional challenge to climate change adaptation
- Integrated Water Resources Management (IWRM) is already facing similar challenges on coordination requirements (between sectors and between different levels), therefore adaptation to climate change needs to be enshrined in ongoing IWRM activities as far as reasonable and best use should be made of possible synergies (e.g. the use of already existing structures)

5 Do you have any plans for continuation of your project beyond 2012? If yes which ideas do you have? How do you see the future of the platform and pilot projects programme under the UNECE Water Convention?

The Danube Climate Adaptation Strategy, which is planned to be adopted by end 2012, is expected to guide the way towards taking decisions on adaptation measures which will be part of the 2nd Danube River Basin Management Plan (according to the WFD) and the 1st Flood Risk Management Plan (according to the EFD) to be finalised by 2015.

6 Contact persons: Raimund Mair, ICPDR Secretariat; Raimund.MAIR@unvienna.org