



Building Resilience to Disasters in  
Western Balkans and Turkey

## Kick-off meeting of the Sava River pilot project – Enhancing hydrological data management and exchange procedures

6-7 June 2013, Zagreb, Croatia

### WORKSHOP REPORT

#### 1. Introduction

In the framework of the IPA/2012/290552 multi-beneficiary project “Building Resilience to Disasters in Western Balkans and Turkey”, a Kick-off meeting of the Sava River pilot project on flood hazard related to the enhancing hydrological data management and exchange procedures was organized on 6-7 April 2013 in Zagreb, Croatia. The overall objective of the project is to reduce vulnerability of IPA beneficiary countries to disasters caused by natural hazards in line with the Hyogo Framework for Action and increase their resilience to climate change. The direct beneficiaries are the national authorities in charge for the disaster risk reduction and disaster risk management and the National Meteorological and Hydrological Services (NMHSs) of Albania, Bosnia and Herzegovina, Croatia, Montenegro, Serbia, Kosovo<sup>1</sup>, the former Yugoslav Republic of Macedonia and Turkey.

The project activities are grouped in eight tasks, of which four are implemented under the WMO management. Among others, the pilot project team will be formed from the hydrology experts from the IPA beneficiaries and representatives of the International Sava River Basin Commission (ISRBC) to review existing practices and develop improved procedures for data management and exchange in the basin level.

#### 1. Meeting objectives and format

The main objectives of the kick-off meeting were to discuss and contribute to (Agenda is attached as Annex 1):

- development of meteorological and hydrological data policy in the Sava river basin;
- improvement of the existing data exchange system for the Sava river basin;
- coordination and harmonization of measurements at stations located at national borders;
- upgrading of the existing hydrologic and hydraulic models for the Sava river (basin).

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<sup>1</sup> \*This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence

The workshop was hosted by the ISRBC and was participated by 19 experts from the project beneficiaries as well as 2 experts from Slovenia (participant list is attached as the Annex 2). The meeting was also attended by Mr. Harry Dixon (UK) WMO consultant on data exchange matters. The presentations of the meeting are available at the ISRBC website: <http://www.savacommission.org>.

## 2. Activities

**Samo Grošelj** from the ISRBC introduced the draft Hydrological and Meteorological Data Management Policy in the Sava River Basin. He presented the definitions on the different types of data and the legal bases for the exchange of data and information in the Sava River Basin. Existing hydrological and meteorological data availability in different beneficiaries was also discussed together with the methodology of preparation, collection and dissemination of HM data and the pricing policy for different types of data. The policy aims at ensuring data interoperability and free access, and is based on WMO resolution 40 (Cg-XII) and 25 (Cg-XIII) and on art. 4 of Sava agreement. Participants highlighted the need to clearly spell out the purpose of data exchange

**Ivan Lovretić** from Dimedia introduced the data exchange system for the Sava River Basin. His presentation was focusing on hydrological and meteorological data from 4 countries that is available at <http://www.savacommission.org>. He introduced the second phase of development of the system with the possibilities to provide data comparison and statistics. The plans to implement an interactive map with the positions of all gauging stations with their basic data was presented, as was the possible option to import historical data that can further be viewed and manipulated in the same way as synchronized data. It was highlighted that data are drawn from national sources available on Internet and are kept only 24 hrs. Participants agreed that, as already national databases exists, there is no need for centralized archiving in ISRBC. It was also noted that data on snow fall, snow cover, snow water equivalent, evapotranspiration and hydropower plant operation are currently lacking.

Mark Jourdan from USACE, David Heywood from COWI and Mitja Brilly from FGg introduced the upgrade of the existing hydrologic and hydraulic models.

**Mark Jourdan** presented the parameters and methods of developing of HEC RAS and HEC HMS model for the Sava River and the results that were achieved. It was specified that the modeling is incomplete at this point and requires more refinement. The HEC-HMS model could be calibrated with additional efforts and utilized to develop discharge inputs to the HEC-RAS model. In future, the modeling of the tributaries to the Sava River could be more critical than the Sava River in terms of evaluating flood risk. He concluded with the need for further refinement of the model with more complete input information and additional calibration and parameter development.

**David Heywood's** presentation concentrated to the hydrologic model development within the Water and Climate Adaptation Plan (WATCAP) for Sava River Basin, discussing the choice of the model (HEC HMS) and the creation of forecast scenarios. Data requirements including input data, hydrologic data and geographic data were also presented. The data collection, calibration and validation requirements were presented as well as the future steps for simulation with climate scenarios.

**Mitja Brilly** presented hydrological modeling and the type of data needed for the model, the calibration and validation and the different types of model use.

**Mark Jourdan** introduced the development of HEC-HMS hydrologic model for the Sava River Basin developed primarily as an example of the capability and functionality of the hydrologic modeling in conjunction with HEC-RAS unsteady flow model. He presented the calibration methods and the results which could be further developed with incorporation of more complete input information. In the future, a calibrated HEC HMS could be used to simulate any necessary scenarios or events providing flow inputs into HEC-RAS model. It is imperative to the development of any desired purposes such as flood risk mapping, flood warning, flood forecasting, or consequence estimation.

**Nejc Pogačnik** from ARSO introduced the Hydrodynamic model development for operational needs in forecasting for the section of the Sava River in Slovenia and the Soča River. The presentation included the existing national systems (e.g. BOBER) and plans, with special emphasis on modeling flood prone areas with the quasi 2D approach and the results of the first phase regarding the improvement of the forecasting system elements and tools and flash flood forecasting development. The Mike Customized Real-time for Flood forecaster on duty application and the web application for operational hydrological service – VodePro was also presented. In addition the implementation of the BOBER project (“Better observation for better environmental response”) was discussed including its goals in sea modeling, agro meteorological system and flood forecasting and warning system development.

**Samo Grošelj** from ISRBC introduced the project proposal for development of flood forecasting and warning system in the Sava River Basin. The main objective of the project would be development of common platform on hydrological and meteorological data, unified models and improved warning procedures and management decisions. The estimated project cost, duration, partners and status were discussed. So far funding for the project has not been secured, but efforts will be done in the future to do so.

## **2. Conclusions, recommendations and the way forward**

Following conclusions and recommendations were reached and way forward agreed during the meeting:

Hydrological and meteorological data management policy for the Sava River Basin:

- Document on Data management policy is a good basis for further development;
- The modifications discussed at the meeting will be introduced in the document;
- Countries will provide information on national legislation by end of June 2013;
- Countries will provide comments on basic principles of the document by end of June 2013;
- Countries will provide examples of current data exchange and list data to be accessible in future;
- Document will be developed by the WMO Consultant and discussed at the ad-hoc EG HMI meeting tentatively to be held in September 2013.

#### Data exchange system for the Sava River Basin:

- Existing data exchange system could be further improved to be user friendly (e.g. introduction of location in Google earth maps);
- The gauging station in BA Fed will be revised at national level;
- No need to introduce data quality control at the ISRBC level - it is provided by the national institutions in the countries;
- The establishment of links to the national databases will be initiated within the ISRBC and relevant institutions at national level.

#### Presentation of the proposal of coordinated measurements at border profiles:

- The coordinated measures at border profiles (e.g. BA /HR, BA/RS and HR/SI) will be performed according to proposed timeframe and on selected locations developed by NHMs.
- Countries will discuss about national measurements programmes on September meeting of HMI EG.
- The participants were also informed of the ongoing activities and outcomes of the WMO project on “Assessment of the Performance of Flow Measurement Instruments and Techniques” being carried out by WMO (<http://www.wmo.int/pages/prog/hwrp/Flow/index.php>) that may be relevant to this action.

#### Upgrade of the existing hydrologic and hydraulic models:

- USACE is willing to continue cooperation in the models development;
- Based on the findings from the visit they will prepare >Scope of Work (SoW) for the both models (HMS & RAS) and for the FIA model (Flood Impact Analysis) pilot model. The SoW will also include options how to proceed and what are the data and information required from the Sava countries;
- The SoW shall be discussed by the ISRBC bodies (and national institutions) in order to decide upon final ToR;
- Training should be one of the important components of the project;
- Key for success is full engagement of the Sava countries in data preparation & delivery to the USACE.

#### Exchange of warnings, forecasts and other information products:

- Facts:
  - o Cooperation between HR and SI exists on the basis of bilateral agreement and will be developed further;
  - o No official agreement yet in other countries;
  - o It is needed to enhance the data exchange system in BA and neighboring countries;
  - o A support is needed for education, modeling etc.;
  - o Only on line data on web pages of NHMs and ISRBC available;
- Conclusion: Participants support further cooperation in this regard.

## AGENDA

Topic	Activity	by	Time
<b>Thursday, June 6, 2013</b>			
Welcome addresses	Introduction	Dejan Komatina (ISRBC)	11:00-11:15
<b>Hydrological and meteorological data management policy for the Sava River Basin</b>	Presentation of challenges and main objectives	Sari Lappi (WMO)	11:15-11:30
	Presentation of Data Management Policy draft document	Samo Grošelj (ISRBC)	11:30-12:00
	General discussion	All	12:00-12:30
<i>Lunch</i>			<i>12:30-13:30</i>
<b>Data exchange system for the Sava River Basin</b>	Presentation of existing system and its technical capabilities	Ivan Lovretić (Dimedia)	13:30-14:00
	Discussion and recommendations	all	14:00-14:30
<b>Review of the draft document</b>	Group work on the draft document	all	14:30-15:30
<i>Break</i>			<i>15:30-16:00</i>
<b>Coordination of hydrometric measurements at border profiles</b>	Presentation of the proposal of coordinated measurements at border profiles	Country representatives	16:00-16:30
	Discussion	all	16:30-17:00
		Plenary discussion and next steps	17:00-17:30
<b>Friday, June 7, 2013</b>			
<b>Upgrade of the existing hydrologic and hydraulic models</b>	Status of hydrological models in the Sava RB	Mark Jourdan (USACE) David Heywood (COWI) Mitja Brilly (FGG)	9:00-10:00
	Status of hydraulic models in the Sava RB	Mark Jourdan (USACE) Nejc Pogačnik (ARSO)	10:00-11:00
	Discussion and recommendations for upgrading of the models	All	11:00-11:30
<i>Break</i>			<i>11:30-12:00</i>
<b>Flood forecasting and warning systems in the Sava River Basin</b>	Existing national systems (e.g BOBER (SI)) and plans	Nejc Pogačnik (ARSO)	12:00-12:30
	Flood forecasting and Warning system for the Sava RB (HMIFFW) - project idea	Samo Grošelj (ISRBC)	12:30-13:00
<b>Exchange of warnings, forecasts and other information products</b>	Discussion	All	13:00-13:30
<b>Kick-off meeting conclusions</b>		All	13:30-14:00
<i>Lunch</i>			<i>14:00-15:00</i>

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