Danube Water Balance

Development of a harmonized water balance modelling system for the Danube River Basin

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„Adapting to Climate change in relation to water” conference

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Basic Project Information

Application Form sent to DRP First Call

Project acronym: **Danube Water Balance**

Funding source: **Interreg Danube Region Programme**

Project title: **Development of a harmonized water balance modelling system for the Danube River Basin**

Budget: **3 028 319,75 EUR**

Duration: **30 months**

Lead partner: **General Directorate of Water Management (OVF - Hungary)**

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Why water balance at Danube level?

- **Achievement of good ecological status of surface water bodies and quantitative status of groundwater bodies is closely linked with knowledge about available water resources**

Danube countries use different approaches on national scale.

Need for a common approach in developing a Danube wide water balance was identified, that should contribute to:

- Better understanding of main components of water balance on basin and sub-basin levels,
- Making a framework for evaluation of management policies leading to good status of water bodies,
- Developing commonly accepted tool to be used for DRBMP and nationals RBMP,
- Assessment of the climate change impacts on elements of water balance.

History of water balance activity

- Commissioned by the ICPDR RBM EG from 2019
- Water Balance Activity working group led by HU and SRB
- A **Scoping study on hydrological modelling of water balance** was finalized in March 2019, it analyzed the needs and the necessary elements of an improved water balance for the Danube River Basin
- **Water Balance Questionnaire** was disseminated to get feedback from the Danube countries on the scope, issues and technical solutions related to water balance assessment
- **Water Balance Background Document** has been prepared by an independent expert in July 2020: a comprehensive overview of a wide list of models from the viewpoint of applicability

History of water balance activity

- The ICPDR decision makers adopted the following resolution in June 2021:
  - Agrees that a single, Danube basin-wide water balance model should be set up with affordable costs, on the basis of already existing data and as little additional data collection by Danube countries as possible;
  - Agrees that the water balance model should also be applicable at sub-basin level and compatible with other ICPDR initiatives (MONERIS, Danube HIS, SOLUTIONS);
  - Supports the involvement of national experts and stakeholders as well as the establishment of a core drafting group to work on the preparation of an international water balance project and therefore asks ICPDR contracting parties to confirm nominations of national water balance experts and welcomes any additional nominations;
  - Asks the Lead Countries (HU and RS) to continue preparing the necessary steps towards in establishing an international consortium of the future water balance project for submitting it to EU Interreg DRP call for proposals in the 2021-2027 period.

Key issue: the model to be used

- It was considered to identify the best suitable water balance model before the start of the project in order to best target the project proposal
- From December 2021 to April 2022 extensive survey elaborated by Technical University of Budapest through 2 questionaries'
- 6 model families have been pre-selected:
  - Community Water Model (CWatM) developed by IIASA
  - HEC-HMS *(by US Army Corps of Engineers, WEST)*
  - MIKE She/Basin *(by DHI)*
  - SWAT *(by Texas A&M University, 2W2E)*
  - wflow-RIBASIM *(by Deltares)*

- Main criteria's:
  - Willingness to join to a project
  - Low cost, affordable solution, easy to set up
  - Handle the DRB as a whole and applicable on sub-basin level
  - Climate change and LULC change scenarios
  - Open access and open source model

Based on the preferences of the participating countries voted for **CWatM** model.

Partnership of the project

20 PPs: university or research institute: 9, national public body: 6, sectoral agency: 3, interest group: 1 public service: 1

13 ASPs: ministry: 5, national public body: 4, sectoral agency: 2, public service: 1, research institute: 1

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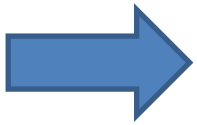
Project structure

- 3 Project Specific Objectives (PSO)

PSO1: Enhanced joint data management for Danube River Basin water management planning

Main activities:

1. Input data specification, design of data storage structure
2. Data collection, validation, harmonization and conversion
3. Data repository building and sharing
4. Development of data import, validation and conversion tools
5. Common data management strategy for future joint activities



Outputs:

1. Harmonized data repository of environmental, hydrological and water management data for the Danube River Basin
2. Data import, conversion and validation tools for the enhanced data handling to support harmonized water balance modelling
3. Joint data management strategy for the future Danube basin cooperation

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PSO2: A Jointly developed water balance tool for the Danube River Basin

Main activities:

1. Setup of open-source water balance model for the Danube River Basin
2. Calibration, validation and uncertainty analysis of the model
3. Development of technical reference and documentation
4. Prepare recommendations to upscale the water balance model into a water management model

Outputs:

1. Open-source water balance model for the Danube River Basin

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- PSO2: Fostering mutual acceptance of joint water balance methodology through capacity building

Main activities:

1. Performing hydrological simulations for transnational subbasins (recent and future) (Tisza, Upper Sava, Drina, Morava)
2. Analysis of climate change impact on water balance of transnational subbasins
3. Elaboration of training materials on data management, model application and result interpretation
4. Trainings on transboundary water balance modelling , capacity building for stakeholders

Outputs:

1. Shared knowledge on joint water balance methodology based on the co-owned DRB WB model
2. Stakeholder insight into transboundary subbasin water balance for past and future conditions
3. Toolbox for post- processing, visualization and interpretation of water balance components in the DRB

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Next steps…

- The MA approved the applications wit conditions
- Condition clearing process

- Subsidy contract signing in December

- Duration: 01.01.2023 – 30.06.2026

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Thank You for Your Attention!

General Directorate of Water Management

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