

WORLD BANK SUPPORT TO BULGARIA'S WATER RESOURCES MANAGEMENT

In mid-2018, the Bulgarian government reached out to the World Bank to request analytical and advisory support for the preparation of the third cycle of the River Basin Management Plans (RBMPs) and the second cycle of the Flood Risk Management Plans (FRMPs) to comply with the EU Directives. The Bulgarian government, jointly with the World Bank committed to a tight timeline to address European Commission recommendations for solid methodological and scientific background in the preparation of the documents.



The Agreement between the Government of Bulgaria and the World Bank, which came into force on September 5, 2018, following a Parliamentary ratification, [was promulgated in the State Gazette](#).

The World Bank's advisory support is designed to provide for a sound scientific methodological approach (based on EU best practice), which ensures a robust scientific background and significantly limits use of expert judgement for the plans' development.

"We strongly believe in Bulgaria's potential to meet the requirements of the EU Water and Floods Directives. The World Bank team working on this project is guided by our institution's strong commitment to help the country improve water resources management, for the benefit of all Bulgarians. We are committed to bringing international knowledge and examples to help the Government prepare scientifically sound plans," said [Fabrizio Zarcone, World Bank Country Manager for Bulgaria, the Czech Republic and Slovakia](#). *"Transparency is key in achieving robust results and the team is supporting stakeholder consultations and public awareness efforts for the plans."*

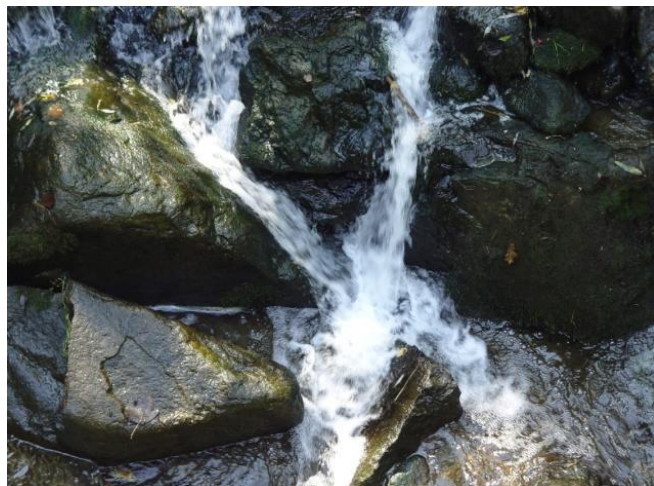
The project consists of two components:

1. Support for the preparation of River Basin Management Plans
2. Support for the preparation of Flood Risk Management Plans

The implementation of both components envisages the following three main stages:

1. Improving the methodological framework
2. Improving the knowledge base
3. Preparing the draft third cycle RBMPs / second cycle FRMPs and associated Programs of Measures. Thus, the plans will be built on a solid methodological and scientific basis.

Currently, the implementation of Component 1 is nearly at the end of its second phase. The methodological base for characterization of both surface and groundwater bodies has been drafted and is being validated through field work and sampling. At this point, the validation of the adequacy and local applicability of the methodologies has been almost completed.



In preparation for the third stage of the project, the Significant Water Management Issues Reports for the four river basins in Bulgaria are being finalized and the public consultations, following a Public Consultations Plan proposed by the Bank, with a wide range of Bulgarian stakeholders are soon to be initiated under the leadership of the Ministry and the River Basin Directorates, as per as their role of competent authorities under the WFD. Table 1 summarizes the activities executed within Component 1 and their current status. The second phase deliverables are mostly approaching completion

while the main focus will now be shifted to the development of the draft River Basin Management Plans.

In Component 2, the first phase of the project is close to finalization with the methodology for the Preliminary Flood Risk Assessment (PFRA) being submitted and approved. The respective assessments have been developed and successfully gone through public consultation process and final documentation is being prepared for reporting to the European Commission. The project's second phase is also expected to be completed soon with Digital Terrain Models developed, methodology for Flood Hazard and Risk Maps (FHRM) delivered to the Ministry of Environment and Waters, based on which the mapping of the areas with potential significant flood risk (APSFs) is currently ongoing. The project is currently entering the implementation of the 3rd phase of the development of the Flood Risk Management Plans (FRMP) in which the actual Programs of Measures for flood risk management will be developed. Table 2 summarizes the activities executed within Component 2 and their current status.

Table 1. Activities under Component 1 – Support for the preparation of River Basin Management Plans

Activity	Status	Short description
Interim reports on significant water management issues	Completed	The World Bank has provided draft interim reports on significant water management issues for all River Basin Districts.
Criteria for the identification of significant pollution from diffuse sources, selection and application of appropriate models for quantitative impact assessment	Completion in September 2021	The main aim of the project is to develop criteria and an approach to identify significant pollution from diffuse sources including indicators to quantify the pressures caused by the main driving forces. A classification system of the significance of pressures will be developed, with specific criteria, indicator weights and/or factors to evaluate different types of pressures, including identification of key quality

		<p>elements (biological, chemical) for the classification of nutrient pressure. Methods for self-purification capacity estimation are evaluated.</p> <p>Examples of applying the classification system on selected water bodies in pilot catchments are provided.</p>
<p>Development of National Approaches for Assessment of Hydro morphological Status of Surface Water Bodies and of National Methodology for Identification and Designation of Heavily Modified Water Bodies</p>	<p>Completion in September 2021</p>	<p>Analytical methods for assessing pressures and impacts at water body scales are being developed including:</p> <p>Methodology for assessment of the hydro morphological status of SWBs of category “rivers”, “lakes” and “transitional waters”; Methodology for the: identification and designation of Heavily Modified Water Bodies; field techniques for characterizing water bodies; conceptual models linking hydro morphological quality elements to biological targets and the assessment of pressures and impacts; methodology for identification and designation of Heavily Modified Water Bodies and definition of Good Environmental Potential; Assessment of the hydro morphological status of all water bodies of category "rivers", "lakes" and "transitional waters"; Development of ecological flows methodology.</p> <p>Within the project a field campaign is executed including detailed surveys of over 200 sites in all River Basin Districts.</p>
<p>Chemical Status assessment methodology reflecting the impacts of the climate changes on the status of surface water including analysis of chemical pressure, impacts, risks and status</p>	<p>Completion In September 2021</p>	<p>A methodology for the assessment of the chemical status of the surface water bodies is developed.</p> <p>Background concentrations with associated uncertainties will be determined. The chemical status of water bodies in the country will be determined including identification of water bodies in risk of failing to meet objectives to achieve good ecological and chemical status, and water bodies for investigative monitoring.</p> <p>Within the project a field campaign has been executed including collection and detailed analysis of 1560 water samples in 130 sites in all River Basin Districts.</p>
<p>Validation of the typology and classification system in Bulgaria for assessment the ecological status of surface water bodies of categories “river”, “lake” and “transitional waters”</p>	<p>Completion in September 2021</p>	<p>A methodology is under development for the assessment of the ecological status of the river sections falling into the transitional zones between adjacent river types.</p> <p>Methods are established for the analysis of BQEs, reference conditions and the classification system for assessment of the Ecological Status in the target types of surface waters including assessment of the interrelationships between anthropogenic pressures, impacts, and biotic response.</p> <p>A classification system is currently under development for assessment of the ecological potential of heavily</p>

		<p>modified water bodies of the types of rivers, lakes/reservoirs and transitional waters under the approach of “mitigation measures”</p> <p>Within the project a field campaign has been executed including 1934 samples in 258 sites in all River Basin Districts.</p>
Methodology for the determination of the groundwater threshold value and background levels	Delivered and conditionally approved	The developed under the project methodology provides the methods to be used to determine the Background Levels (BGL) and includes a method to assess the chemical pressure link to anthropogenic activities as well as the thresholds values (TV) which will also serve as a reference for the determination of the chemical status of the groundwater bodies.
Updated Methodology for Delineation and characterization of Groundwater bodies	Delivered and conditionally approved	An updated integrated approach has been proposed for delineation and characterization of Ground Water Bodies that will meet the requirements of the Water Framework Directive and will be appropriate for Bulgarian conditions, given the availability of data. The methodology also describes methodological approaches that were used in the past but not yet formalized. All methodological steps, both newly described or already present in the previous version of the methodology are combined in one unique methodology.
National groundwater quality survey and abstraction estimate	Completed	Sampling data from 20 quantitative inventory zones has been collected and from 350 sites for physicochemical analyses.
Characterization of Sofia valley Neogene and quaternary aquifer systems and update of the corresponding groundwater bodies quantitative and chemical risks and status	Completion in September 2021	<p>A mathematical flow model of the Sofia valley has been developed and will be transferred to the Danube River Basin Directorate to be used as a Groundwater Management Tool.</p> <p>The results include pressure, impact assessment and characterization of the Sofia valley aquifers as well as delineation of protection zones around public wells delivering drinkable water.</p> <p>Within the project a field campaign has been executed for the collection of calibration data for the model - piezometric measurements in 50 points and water quality survey campaign in 25 points.</p>
Update of delineation and characterization of the groundwater bodies at risk, including pressure and risks analysis, and status assessment	In progress	A methodical approach for refinements of delineation and additional characterization of groundwater bodies will be developed as well as a methodology for the determination of the groundwater threshold value and background levels. Terrestrial ecosystems and surface water bodies with which the groundwater bodies are connected will be determined. The delineation of

		groundwater bodies will be updated where necessary and the characterization of groundwater bodies will be completed including evaluation of quantitative and qualitative pressures.
Update of the economic analysis	In progress	All economic analysis required for the delivery of the River Basin Management Plans will be generated by the assignment.
An approach for justification for the exceptions in line with Article 4 of the WFD	Draft delivered	This activity includes development of methodologies for application of the exemptions under Article 4 of the Water Framework Directive and training for the Ministry and river basin directorates on application of the methodologies.
Preparation of draft River Basin Management Plans	In progress	Preparation of draft River Basin Management Plans for all four River Basin Districts. The task will include updating of the catalogue of measures including indicative pricing assumptions and development of the Program of Measures for all River Basin Districts.

Additionally, within Component 1, several capacity-building events, for the Bulgarian administration, have been organized by the World Bank including:

- A workshop on integrating international best practices on the use of climate information and tools for national planning purposes (June 2019 in Sofia, with the participation of leading experts in the field, including the World Meteorological Organization (WMO), the United Nations Developing Programme (UNDP), the European Environmental Agency (EEA) and the Ministry of Environment and Water in Spain)
- A workshop on characterization and delineation of groundwater bodies (GWBs), as well as on the determination of the groundwater threshold value and background levels (September 2019 in Sofia)
- A workshop on Hydro morphology and heavily modified water bodies (HMWB) (December 2019 in Sofia)
- A workshop on exemptions under Article 4.4, 4.5 and 4.7 (October 2019 in Sofia)
- An international workshop on managing flood risk through sharing of EU best practices (November 2019 in Bucharest, Romania).

Table 2. Activities under Component 2 Support for the preparation of Flood Risk Management Plans

Activity	Status	Short description
Methodology for preliminary flood risk assessment (PFRA)	Delivered and approved	This document provides the methodological basis for the implementation of the first stage of the Floods Directive – PFRA. It is an update of the existing PFRA Methodology developed in 2011 addressing the recommendation of the EC and including the following new key aspects:

		<ul style="list-style-type: none"> • Methodology for mapping / determining the hazard of pluvial floods. • Climate change and its impact on the flood hazard. • Update of the criteria for determining significant floods and the criteria for determining areas with significant potential flood risk (APSR).
Preliminary flood risk assessment reports	Delivered and pending approval	This report presents the implementation of the new methodology for PFRA within the first stage of the second cycle of the Flood directive. The nature and scope of the performed activities fully covers the requirements of the PFRA methodology. As a result of the implementation of the PFRA, areas with potential significant flood risk (APSRs) have been identified, which reflect the territories in the country with an increased risk of flooding. Four separate PFRA reports and relevant documentation have been developed for each river basin directorate.
Public consultations on the preliminary flood risk assessment	Public consultations successfully completed	The updated Preliminary Flood Risk Assessment plans for the four basin directorates were prepared in cooperation with a very wide range of stakeholders. Over 480 institutions were involved in the process the development of the plans and over 540 institutions and organizations participated during the public consultation process. This approach to stakeholder engagement from the beginning of the development of the planning documents gave a very positive result. During the public consultations of draft plans the stakeholders praised very high the quality of the prepared documents. The received written opinions on the draft PFRA were also acknowledging the huge work and the good end result while 98% of the surveyed participants in the meetings stated that the information received meet their expectations.
Preparation of Digital Terrain Model (DTM), Digital Surface Model (DSM) and Orthophoto maps for the purpose of development of flood hazard and flood risk maps	Delivered and pending approval	The objective of this work was to provide a new Digital Terrain Model (DTM), Digital Surface Model (DSM) and Orthophoto maps in the areas defined in the PFRA with necessary accuracy for hydraulic modeling. This has been achieved by performing new mapping for the territory of each designated Area of Potential and Significant Flood Risk

		(APSR), using integrated remote sensing methods and techniques, scientifically grounded field surveys and spatial-analytical approaches.
Update of the national methodology for flood hazard and risk mapping	Delivered and pending approval	The update of the National methodology for flood hazard and flood risk mapping was set as a requirement for the forthcoming cycle of FRMPs so that the next generations of plans comply with the comments by the European Commission, as well as to reflect the local and international experience from the implementation of the previous plans and the evolution of methods and techniques for data collection, processing and interpretation. The present update of the FHRM methodology introduces the following new elements and improvements to the existing methodology: development of method for mapping the flood hazard caused by pluvial and flash floods; improvement of the existing methodology for coastal flood hazard mapping; consideration of the climate change effect on all sources of the flooding; Update of the method for vulnerability and risk assessment;
Preparation of flood hazard and risk maps	In progress	The team is working on the update of the flood hazard and risk maps on the basis of the results of wide public consultation held on updated Preliminary Flood Risk Assessment plans and in line with the updated national methodology for flood hazard and risk mapping.
Preparation of draft flood risk management plans	In progress	The preparation of the draft flood risk management plans and associated Programs of measures has started. FRMPs are built on the basis of the former implementation stages and taking into account the work done during the first cycle of FRMP in each River basin Directorate.