DRIN CORDA

Enabling
Transboundary Cooperation
& Integrated Water Resources Management
in the extended DRIN RIVER BASIN

Terms of reference:
Expert supporting Drin Project on GIS and Database

In the framework of:

Memorandum of Understanding
for the Management of the Extended Transboundary Drin Basin

GEF Project "Enabling Transboundary Cooperation and Integrated Water Resources Management in the Extended Drin River Basin"

20 February 2017

The Coordinated Action for the implementation of the Memorandum of Understanding for the management of the Drin basin (Drin CORDA) is supported by the GEF Drin Project. The latter is implemented by the United Nations Development Programme (UNDP) and executed by the Global Water Partnership (GWP) through GWP-Mediterranean (GWP-Med), in cooperation with the United Nations Economic Commission for Europe (UNECE). GWP-Med serves as the Secretariat of the Drin Core Group, the multilateral body responsible for the implementation of the Memorandum of Understanding.

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Introduction - Background

The Drin Memorandum of Understanding

Coordinated action at the Drin Basin level has been absent until the development of the Shared Vision for the sustainable management of the Drin Basin and the signing of a related Memorandum of Understanding (Tirana, 25 November 2011) by the Ministers of the water and environment management competent ministries of the Drin Riparians i.e. Albania, The Former Yugoslav Republic of Macedonia, Greece, Kosovo* and Montenegro. This was the outcome of the Drin Dialogue coordinated by the Global Water Partnership Mediterranean (GWP-Med) and UNECE.

The main objective of the Drin MoU is the attainment of the Shared Vision: "*Promote joint action for the coordinated integrated management of the shared water resources in the Drin Basin, as a means to safeguard and restore, to the extent possible, the ecosystems and the services they provide, and to promote sustainable development across the Drin Basin*".

The **ultimate goal** of the work in the Drin Basin is to reach a point in the future where the scale of management lifts from single water bodies to the hydrological interconnected system of the Drin Basin, eventually leading from the sharing of waters among Riparians and conflicting uses, to the sharing of benefits among stakeholders.

The Drin Coordinated Action

A process called the "Drin CORDA", Drin Coordinated Action for the implementation of the Drin MoU, was put in place after the signing of the latter.

Following the provisions of the Drin MoU an institutional structure was established. It includes:

- The **Meeting of the Parties**.
- The **Drin Core Group** (DCG). This body is given the mandate to coordinate actions for the implementation of the MoU.
- Three **Expert Working Groups** (EWG) to assist the DCG in its work:
  - Water Framework Directive implementation EWG.
  - Monitoring and Information exchange EWG.
  - Biodiversity and Ecosystem EWG.

The **DCG Secretariat** provides technical and administrative support to the DCG; Global Water Partnership – Mediterranean (GWP-Med) serves by appointment of the Parties through the MoU as the Secretariat.

An Action Plan was prepared to operationalize the Drin CORDA. This has been subject to updates and amendments in accordance with the decisions of the Meeting of the Parties to the Drin MoU and the DCG. The DCG and its Secretariat guides the implementation of the action plan while its implementation is currently being supported by the Global Environment Facility[1] (GEF); see below.

The GEF Drin Project

The GEF supported Project "Enabling transboundary cooperation and integrated water resources management in the extended Drin River Basin" (GEF Drin Project) is aligned in content, aims and objectives with the Action Plan and the activities under the Drin CORDA.

[1] www.thegef.org

The objective of the project is to *promote joint management of the shared water resources of the transboundary Drin River Basin, including coordination mechanisms among the various sub-basin joint commissions and committees*. Albania, The Former Yugoslav Republic of Macedonia, Kosovo and Montenegro are the Project beneficiaries.

The GEF Drin Project is structured around five components:

- Component 1: Consolidating a common knowledge base
- Component 2: Building the foundation for multi-country cooperation
- Component 3: Institutional strengthening for Integrated River Basin Management (IRBM)
- Component 4: Demonstration of technologies and practices for IWRM and ecosystem management
- Component 5: Stakeholder Involvement, Gender Mainstreaming and Communication Strategies

The Project is implemented by the UNDP and executed by the Global Water Partnership (GWP) through GWP-Mediterranean (GWP-Med) in cooperation with the United Nations Economic Commission for Europe (UNECE); GWP-Med is responsible for the realization of the Project. The Drin Core Group is the Steering Committee (SC) of the Project.

It is managed by a Project Coordination Unit (PMU), based in Tirana, Albania; staff is stationed also in Podgorica, Ohrid, Pristina, and Athens. The duration of the Project is four years.

GEF Drin Project Outputs

The GEF Drin Project within its Component 1: "Consolidating a common knowledge base" will carry out a Transboundary Diagnostic Analysis (TDA), in order to identify and assess transboundary basin management issues -including those related to water and other natural resources as well as environmental management- assess the environmental impacts and socio-economic consequences and, identify the immediate and underlying causes of these issues.

The TDA shall provide the necessary information that will enable Drin Riparians to discuss and decide on the issues that will be addressed with priority, negotiate and formulate a Strategic Action Programme to address the causes and drivers.

In addition, the TDA shall assist in enhancing the knowledge basis of the Drin Riparians regarding the state of the natural and anthropogenic environment in the basin and preparing for the development of a Drin Basin Management Plan in the future.

The **GEF TDA–SAP methodology** will be used for the development of the TDA (http://iwlearn.net/manuals/tda-sap-methodology). Provisions of the **EU Water Framework Directive** (EU WFD) in relation to the characterization of the basin and the sub-basins will be adhered to as part of the TDA development process. The **"Situation Analysis – Management of the Extended Drin Basin"** (Drin Situation Analysis - DSA) serves as a starting point for the development of the Drin TDA. The DSA represents a comprehensive attempt to identify the transboundary issues in the Drin basin and their causes; it was prepared by GWP-Med and national experts in the framework of the preparation of the Drin Project.

Six domains will be assessed under the TDA: (i) Biodiversity and Ecosystems; (ii) Pollution; (iii) Institutional and Legal Setting; (iv) Nexus; (v) Socioeconomics and (vi) Hydrology/Hydrogeology. A

Thematic Report for each one of these domains will be prepared. A Synthesis report will synthesize the findings of the thematic reports into a comprehensive analysis of pressures, state, issues and their underlying causes.

In the process of elaboration of the TDA, numerous information and data will be gathered through concerted data collection exercises for the Thematic Reports, including GIS data.

Expert supporting Drin Project on GIS and Database

Objectives

The objective of this assignment is to support the PMU in executing the project by developing, populating and maintaining a consistent Project geoDatabase including a Geographical Information System (GIS) for the GEF Drin Project (from this point forward refered to as the "Project"). The preparation of appropriate maps to be used for the needs of the Project is an additional objective.

Description of the Assignment

The objective of the assignment is to actively support the PCU to be able to store and use water management data in appropriate manner for the needs of the GWPMed GEF Drin Project.

In order to achieve this objective, the consultant will:

i) Develop, populate and maintain a consistent Project geodatabase

Ii) Integrate the geodatabase in an appropriate Geographical Information System (GIS); support the PMU and project experts in using, processing and analysing the data stored in the geodatabase for the creation and development of geospatial information as necessary for the needs of the project

The Project geodatabase shall be developed to contain and -when ready- will comprise a variety of basin and aquifer management related information and data, from the Extended Drin River Basin collected for the needs of the Project.
The data collected in the process of elaboration of the TDA will be stored and maintained in the Database.

It is expected that initially the Geodatabase will contain and provide information on (list is indicative and not exhaustive):

- basic geographical maps in GIS format
- surface waters (hydrographical network and water areas)
- groundwater objects (springs, wells, boreholes, geomorphological objects, groundwater bodies - aquifers)
- the hydrometric and meteorological network (including at least the type of station, coordinates, data generation frequency and period);
- available hydrometric and meteorological data (including all relevant data collected, e.g. levels and computed/estimated flow of surface water; levels of groundwater and computed/estimated

aquifer parameters, temperature, precipitation, snow depth etc.)

- the existing water quality monitoring network (including at least the location of monitoring points and parameters measured);
- available water quality data (including all relevant water quality data collected for surface water and groundwater);
- protected areas (including at least the delineation of physical boundaries and zonation as well as criteria for protection);
- land use information (including wetlands, irrigated/rain-fed agricultural land, forests, built-up areas, political/administrative/basin boundaries)
- water resources management structures (including at least the location and size/capacity of dams, diversion/protection structures, irrigation infrastructure and hydroelectric plants);
- known major water abstraction points (including at least their location and daily abstraction - measured or estimated -for each abstraction point); and
- known point-pollution sources (including at least their location, and the type and extent of pollution).

This data is currently being acquired through the respective national institutions, expert reports and different assignments, including collection of data from ongoing similar projects in the region. All collected data will be made available for the consultant (in continuous manner) to use for (i) the design of the structure of the geodatabase; the IMS development -see further below- should be take also into consideration in this regard (ii) to develop the geodatabase. -The consultant will be required to collect additional data through own channels and sources to supplement those that will be collected by the Project through other means.

The database should be in the form of a Multi-user Geodatabase. The Multi-user Geodatabase integrates data into a unique system, using GIS software with RDBMS database in the background. Layer organization, database structure and data precision should be defined in accordance with professional standards.

Following completion of Thematic Reports (as final phase of TDA development), the geo database should be able to accommodate storage of data produced and/or grouped during of the TDA development process.

The geodatabase should also contain:

- An extended bibliography (to describe and facilitate access to information)
- A meta-database (to describe and facilitate access to data)
- The inventory of new data produced by the Project

The geodatabase will thus be a structured repository of river, aquifer and environmental management data, it will be used to supply data and - through the use of GIS software – prepare processed products to the Project Officers and stakeholders.

Particular attention is required on the issue of interconnectivity and compatibility of the Drin project geodatabase with Informational Management System of the Drin extended area (IMS; currently under development). The project database shell serve as first input to IMS. In that regard, it is required that the consultant liaise with the assistance of the PMU, from the beginning of the assignment with the consultant that develops the specifications of the IMS and take these into consideration for designing

the project geodatabase.

The data - existing as well as those to be collected - should be adjusted (re-projected or otherwise processed) and harmonized as appropriate and necessary. This process is required to adhere to strict defined spatial topological conditions. The geodatabase should, in addition to all the usual elements (layers, tables, relations), contain defined topological rules for all the spatial layers, and have defined validators for alphanumeric fields in order to avoid mistakes.

As regards populating the database, different levels of user rights will be applied in order to make the system safe and at the same time practical.

The Project geodatabase shall be developed in such a way that it becomes a system that can be sustainably maintained, up-dated and customized as new information is being gathered, and as conditions and requirements change, and opportunities for development of the system arise in the future. This will be achieved by developing a tailor-made, internet-based system.

In cooperation with the PCU, the Consultant will:

- Develop and propose the project geodatabase structure (the architecture of a geodatabase)
- Systematically store relevant available information and data (see above) regarding the management of the extended Drin River Basin, collected by the Project or by the consultant;
- Design, develop and implement a GIS that will serve as a first version of the Project GIS Database. This will include the identification of hardware procurement needs, preparation of procurement documents and assistance in the procurement process as regards fulfilment of technical specifications. At this stage, data acquisition and population of the GIS with data will take place. This will necessitate the preparation of a complete inventory of data available in the Project.
- Carry out on-the-job training activities for Project Officers who will be involved in populating, operating or using the GIS, and prepare manuals for the different activities, including for future up-dating of the database. The main responsibility and effort for populating the GIS is expected to rest with experts and Project Officers.
- Following a successful conclusion of the data population, maintenance and data security should be provided.

The final design and selection of hardware and software will be made by the consultant in close dialogue with the PCU to ensure a product which is tailor-made for the purpose and easy to manage by the Drin Project Team The below concept may therefore be seen as a guiding indication.

The GIS should be built so that it can be accessible by different officers situated in different locations. Therefore, the system should be accessible via Internet.

The system will need the following hardware and software products:

Hardware:

- A capable data server for storage of data and serving users with information.
- One highly capable computer for design and maintenance of the information system.
- A number of user computers located at different institutions.
- A colour A3 printer.

Software:

- RDBMS software (with local technical support in Albania).

- Software for web applications (with local technical support in Albania).
- GIS desktop software corresponding to ArcGIS with Spatial Analyst and 3D Analyst extension functionality and ArcHydro. GIS server software corresponding to ArcGIS for Server Enterprise Standard functionality. GIS desktop software and GIS server software functionality functional descriptions are attached. All GIS software must have local technical support in Albania.

Input by the Project Management Unit (PMU)

The PMU will provide:

i. Specifications regarding information and data to be collected (including format, units, time series, locations etc.).
ii. Available background information (data and data sources) as well as a proposal regarding data collection method.
iii. Data collected through data collection exercise with national experts and through elaboration of Thematic Reports.

Requested Services

The Consultant will:

1. Discuss with the Project Management Unit (PMU) data specifications, methods for data collection and advise on these.
2. Identify sources of information, including national and private institutions and organizations, interned based sources, publicly available studies and reports etc.
3. Develop the architecture of the geodatabase and create the latter.
4. Systematically record and store data as it is collected. Compile the data and information in geodatabase and GIS format. Original data sources (e.g. obtained reports, raw data files, time series, maps etc.) should be kept and stored along with the data tables in a systematic manner.
5. Support PMU in working with GIS files and databases.
6. Follow the guidance and recommendations from the PMU during the process of collection and reporting.
7. Provide comments on the draft Final Report of the Information Management System- Phase 1.
8. Produce maps in GIS format as necessary for the Thematic Reports the TDA and other needs of the Project, using already gathered information and data, under guidance of the PMU.

The work-load is estimated as 5 working days per month, over a period of 12 months.

Contract Price

1. The fee for this assignment is 12,000 USD.
2. This amount includes all other costs, income taxes and any other amount payable or cost that may be required for the completion of the work/service.
3. An advance payment of 20% is planned upon contract signature.
4. All other payments shall be in two-monthly tranches upon reception and acceptance/verification of the deliverables, as laid out in the table below.

Monitoring and Progress Controls

The Consultant should deliver:

1. Information in an appropriate format and structured as described under section "Requested Services" above and under section "Schedule of Activities, Deliverables and Payment" below.
2. Brief (max 2 page) bi-monthly progress reports, describing:
    a. Tasks accomplished, including GIS and other data collected and stored; and
    b. Planned tasks for the next two-month period.

The activity will be delivered under the lead and guidance of the PMU. Deliverables will be verified by the **designated staff of the PMU** for integrity, comprehensiveness and quality.

The Consultant may be requested to work remotely with Project Officers in the other Drin Riparians for the preparation of the contribution with Riparian-level information and any other identified stakeholders as directed by the PMU.

The Consultant may be asked to travel to participate in working and/or consultation meetings The Consultant is expected to arrange directly traveling to the places the meeting will take place at. Travel costs to participate in meetings will be covered separately by the GEF Drin Project.

The Consultant will be paid a fixed amount and payments will be made based on bi-monthly progress reports (see below). Claims for payment will be made through an invoice accompanied by proof of delivery.

The consultancy will commence work on March 2017 and continue until completion of the assignment, but not later than March 31st, 2018.
The consultancy may be extended if further work is required or unexpected delays occur.

Schedule of Activities, Deliverables and Payment

Task		Deliverables	Deadline	Expert working days	Payment
			Upon contract signature		20%
Support PMU to develop, populate and maintain a consistent Project Database including a GIS	Develop a database and GIS	GIS & Database	30 April 2017	5	
	Final design and selection of hardware and software	Specifications		5	
	Systematically input data acquired through the respective national institutions, expert reports and data collection elaboration of the TDA and pertaining Thematic Reports	GIS and water related databases	31 Oct 2017	20	
Training for PMU	Data input and maintenance	Training completed	31 Dec 2017	5	
	Data access and use of the GIS			5	

IMS connection	Provide comments on IMS Draft Final Report	Connection functional	31 Oct 2017	2	
	Interconnect Project Database with IMS		30 Nov 2017	3	
Prepare brief bimonthly progress reports.		Bimonthly reports		3	
Prepare data inventory and brief User Manual		Data Inventory User Manual	31 Jan 2017	2	
Support PMU in data analyses and Presentation with GIS tools. Prepare maps in GIS format for the Transboundary Diagnostic Analysis based on previously collected data		Maps for the TDA	28 Feb 2017	10	

The Payment will be in six (6) equal 2-monthly tranches to an amount of 1/6 of the overall Contract, starting two months from beginning of the assignment (contract signing).

The payment will be subject to approval of the Project Manager following submission of a brief Bi-monthly Progress Report

The final payment will be upon full completion of the assignment.

Duration of the Contract

The overall duration of the contract will be 12 months.

Location and Language of the Assignment

The location of the assignment will be in Tirana. The language for all documents and reports as well as for all communication is English.

Qualification and Experience

a. Education

A university degree in engineering, geography, hydrology, hydrogeology, water management, environmental management or equivalent is required.

b. Work Experience

The Consultant is required to have:

- Minimum 10 years of professional experience in GIS.
- Experience in GIS application preferably in hydrological studies, on Integrated Water Resources Management (IWRM), water governance, including elaboration of related technical assessments, also on institutional and legislative aspects - at regional and national levels.

Experience in IWRM and environmental monitoring and reporting, environmental compliance and enforcement, etc. will be an asset.

c. Key Competencies

The Consultant is required to have the following competencies and skills:

- Very good understanding of the EU Directives related to GIS (eg. INSPIRE), water resources, hydrology and hydrogeology and environment management.
- Excellent written and spoken English.