



## Work Package 2 Peer To Peer for Experience Sharing

### Appendix 2 P2P No. 8a: Focus Group on Water Information Systems (WIS)

### WIS Report

SWIM–Horizon 2020 Support Mechanism  
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## THE SWIM AND H2020 SUPPORT MECHANISM PROJECT (2016-2019)

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The SWIM-H2020 SM is a Regional Technical Support Program that is funded by the European Neighborhood Instrument (ENI) South/Environment. It ensures the continuation of EU's regional support to ENP South countries in the fields of water management, marine pollution prevention and adds value to other important EU-funded regional programs in related fields, in particular the SWITCH-Med program, and the Clima South program, as well as to projects under the EU bilateral programming, where environment and water are identified as priority sectors for the EU co-operation. It complements and provides operational partnerships and links with the projects labelled by the Union for the Mediterranean, project preparation facilities in particular MESHIP phase II and with the next phase of the ENPI-SEIS project on environmental information systems, whereas its work plan will be coherent with, and supportive of, the Barcelona Convention and its Mediterranean Action Plan.

The overall objective of the Program is to contribute to reduced marine pollution and a more sustainable use of scarce water resources. The Technical Assistance services are grouped in 6 work packages: WP1. Expert facility, WP2. Peer-to-peer experience sharing and dialogue, WP3. Training activities, WP4. Communication and visibility, WP5. Capitalizing the lessons learnt, good practices and success stories and WP6. Support activities



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# 1. CONTEXT

As part of its overall workplan, and under its work package (WP2), the EU-funded “Sustainable Water Integrated Management & Horizon 2020 - Support Mechanism (SWIM-H2020 SM)” project implemented a Peer to Peer (P2P) activity under one of its Priority Themes: “Decentralised Water Management (DcWM)”, focusing on “Water Information Systems” (WIS).

The objectives of the Peer to Peer activity, which involves direct exchange of experience between peers from relevant institutions in the beneficiary countries, are:

- Sharing expertise and guidance among Peers on a specific issue/topic;
- Boosting south-to-south (and also north-to-south) cooperation;
- Building the cornerstones for long-lasting relations and exchanges, as opposed to one-time ad-hoc exchange.

The exchange within the P2P activity is typically focused around pressing/emerging issues in the beneficiary countries. At the time of the activity, the Lebanese peers were tasked with establishing a Water Information System for their country, based on which the focus group was identified together with the coach and the country offering the expertise as per the following table:

Table 1: Countries and peers involved in P2P 8a Focus Group

Focus Group	Country Receiving	Country offering	Coach and contact information
	Expertise and contact persons		
<b>P2P-8A):</b> Water Information Systems	<b>Lebanon:</b> 1. Eng. Samar Hejazi Email: samar.r.hijazi@gmail.com Eng. Samer Housaini Email: samertoo@gmail.com	<b>Austria:</b> Eng. Arnulf Schönbauer Umweltbundesamt GmbH Email: <a href="mailto:arnulf.schoenbauer@umweltbundesamt.at">arnulf.schoenbauer@umweltbundesamt.at</a> P: +43-(0)1-31304/3573	<b>Austria:</b> Eng. Arnulf Schönbauer Umweltbundesamt GmbH Email: <a href="mailto:arnulf.schoenbauer@umweltbundesamt.at">arnulf.schoenbauer@umweltbundesamt.at</a> P: +43-(0)1-31304/3573

# 2. METHODOLOGY

Since there are no peers from countries offering expertise, the information was provided by the coach only, i.e. the coach acted as both a coach and peer at the same time.

The methodology comprised e-mail exchange, face-to-face session and Skype meetings.

At the beginning of April 2018, the peers from Lebanon requesting expertise provided information notes on the water sector (Annex 1) and were asked to identify the imminent issues/questions pertaining to the focus group.

Questions were submitted and discussed during a dedicated Peer-to-Peer session that was held during the Regional On-site Training (REG-5) on decentralised water management held



in Vienna at the end of April 2018. During the discussion, a first feedback was given by the Austrian peer.

The questions comprised a wide range of topics related to the establishment, funding and operation of a national Water Information System (Annex 2). To cover the entire questions in depth would be out of scope of the P2P process as the resources are limited. It was agreed that the replies would cover all questions (but in short) via E-mail. The replies are given in Annex 3. In August, a Skype meeting was held for clarification and detailed discussion.

### 3. OUTCOME

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Already at the beginning of the P2P process, the Lebanese peers had a fairly good understanding of the requirements to be considered for the development and operation of a Water Information System. The exchange of experiences was therefore carried out at an advanced level.

At the time of the P2P, the Lebanese peers focused their work on how to ensure data exchange with other national data providers and to answer the questions on the kind of legal framework required. The communication between national experts is well established. The challenges lie in reaching agreement at inter-ministerial level.

The conclusion of the P2P process was that there must be a legal framework in place as otherwise sustainable data flow in the WIS cannot be secured. Which legal framework (memorandum of understanding, regulation, law) is required depends on the national legislations' requirements and on the political understanding of the decision-makers of its necessity.

Typically, data for the management of national water resources come from several public and parastatal institutions; institutions, which might work under different ministries and laws with different objectives. They all could contribute with data and information to the WIS or might have an interest in it. This represents a valuable resource that could be used in the development of the WIS. Recommendation from the Austrian peer was to consider the establishment of a formal national expert working group (WG) where (technical) representatives from the data providers will be members. The WG can serve as a platform for the discussion of various topics (technical, legal, data user needs,...), ranging from seeking to establish common understanding of issues affecting the respective institutions to preparing the documents required for inter-ministerial agreements.

A technical subject discussed in the Skype meeting concerned the standardisation of transfer of national data (data schemes). Institutions generating water data typically can provide them in formats fitting to their specific needs which might not be consistent with other data generating institutions. When putting national data in one WIS they need to be provided in a format which can be uploaded in the WIS data base. Often, this requires adaptation of the download interface on the data provider's side. On the other hand, the WIS could include functions which allow the uploading of data in different formats and the download in the



format needed for international and national reporting obligation. For a structured organisation of the data exchange, the development of a national data dictionary where metadata and schemes are described and agreement on such a dictionary are recommended.

The Austrian peer suggested identifying in an early stage of the WIS development the data users and their needs. The decision will determine the development of the WIS in a number of issues, e.g. technical features, time line of implementation, data protection and security and particularly important the costs.

## 4. CONCLUSIONS AND RECOMMENDATIONS

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The P2P was an open exchange of knowledge. The receiving peers introduced their topics they are currently working on. Based on his experience, the offering peer gave his feedback, which serves as a pool of ideas for the receiving peer. Considering the small number of budgeted days, the output is considerable.

The clear formulation of questions and provision of background by the receiving peer was a crucial contribution to the quality of the P2P process.

Holding face-to-face sessions and Skype meetings alongside written communication was also important (particularly, for the clarification of questions and avoiding of misunderstandings).

The invitation of participants other than the peers to the P2P face-to-face session held during the REG-5 training enhanced the exchange of experiences between them. A lively discussion with additional questions took place but reduced the time the peers had with each other to go into details. For further face-to-face P2P sessions which take place within a training workshop, other participants might be invited as observers only.

## 5. ANNEXES

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### 5.1 INFORMATION NOTES ON LEBANESE WATER SECTOR PROVIDED BY THE RECIPIENT PEERS IN LEBANON

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In order to define our needs in the water sector, regarding decentralized water management and Water information system in particular, one should know the status of the water sector, and the data sharing procedures.

#### Main Players in the Water Sector:

1. Ministry of Energy and Water (MoEW): Main responsible institution, overseeing water establishments. Its main roles include strategic planning, development of water



master plans, performing different studies on water supply, water demands, and collecting water data from the different institutions, etc. ...

2. Water Establishments: There are 4 water establishments in Lebanon (North, South, Bekaa, and Beirut & Mount Lebanon) responsible for the operation and management of all water distribution networks whether for irrigation and domestic uses including tariff collection, rehabilitation, and water allocation between the different users.
3. Litani River Authority (LRA): Measures the discharge data for all rivers and springs across Lebanon, studies and executes dams in the Litani River Basin, and is also responsible for all irrigation schemes in the basin (Bekaa and South)
4. National Council for Scientific Research (NCSR): GIS expertise and remote sensing data processing (crop mapping, evapotranspiration...), research studies, hydrologic water modelling...
5. Master and PHD thesis addressing Water Management solutions in some basins.

#### Data Sources :

Type of Data	Data Source	Responsible Institution(s)
Meteorological Data	Ground Stations, Remote Sensing	Directorate General of Civil Aviation (DGCA), Lebanese Agriculture Research Institute (LARI), (NCSR)
Land Data (Land use, elevation..)	Remote Sensing + ground validation	CNRS, Directorate of Geographic Affairs- Lebanese Army
Hydrological Data (rivers, springs..)	Ground gauges	Litani River Authority (LRA)
Groundwater monitoring	Water meters, piezometers	Ministry of Energy and Water (MoEW), LRA (in the upper Litani basin)
Water consumption		Water Establishments (MoEW)
Socio- Economic Data		Central administration of Statistics

#### Problems and Recommendations:

1. Data sharing policy is absent, and frequently there is difficulty to acquire data.
2. There is no defined role of each institution (More than one institution perform the same role), and there's no exchange of data between them which leads to duplication of data.
3. Data collection is not standardized and not same software used.
4. Unreliable data, in addition to many data gaps.
5. Many institutions depend on selling data for financing its expenses and operations.
6. There can be potential merits in revising institutional structures or arrangements, especially to improve data sharing and coordination. Hopefully the establishment of





the “Centre of Information and Training on Water” planned to be launched soon will be the first step on the way.

## 5.2. AGREED TOPICS /QUESTIONS WITHIN THE FOCUS GROUP

No.	Questions/Issues Raised by Lebanon	Proposed Themes	Proposed Output
1	How can a Water Information System (WIS) help in the issue of data sharing?	Data Sharing	1. Institutional responsibility for Data management: Generation, Processing and Provision
2	To which administrative level (competent authority) the responsibility for operating a WIS may be given? (one authority or each organization is responsible of its part)?	WIS governance	
3	What are possible difficulties during the developing phase of the WIS?	WIS creation	
4	What are some prerequisites for establishing a WIS?	WIS creation	
5	Is all data shared free? Is it possible to have an online payment system?	Data sharing	
6	What should be the geographical unit for this management, knowing that in some cases the same basin follows two different districts, and we have many inter basins transfer?	Management in shared basins	
7	Is the establishment of a WIS in a multi-level governance structure more demanding than in a centralized governance structure	Management	
8	What legislative amendment should be made to make a WIS achievable?	Legislative amendments	
9	How to insure the quality of data shared on the system?	Quality Assurance (QA) and Quality Control (QC)	2. Technical solutions: QAQC / Data quality and validation and publishing
10	How to manage multiplicity of data produced by different organizations especially that they come in different formats and quality	QAQC and data protocols	
11	How to display all data that are originally in different forms and formats in a proper and understandable manner?	Information products	
12	How to manage sharing this data to public not just between organizations?	Data sharing	



## 5.3 ANSWERS OF THE OFFERING PEER AUSTRIA

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This annex addresses the questions (of Annex 5.2 above) raised by the peers from Lebanon as per the concept note approved by the recipient peers and the implementation schedule thereof.

### **Q 1. How can a Water Information System (WIS) help in the issue of data sharing?**

Objective of the WIS is to serve the users which have different demands on the data (and information). In the development process of the WIS, it must be determined with whom the data should be shared (public, national, international) and what technical requirements they have.

#### General points are

- Single point of upload and access of data and other information (e.g. reports, maps) supports the sharing.
- When the data quality in the WIS is trusted (assured quality control), the WIS will be used as a reference site and data use (dissemination) will be supported.
- A WIS could have different data upload formats and a conversion tool to allow the download in a specific format. This feature is useful when data is provided in different formats but needs to be reported (nationally or internationally) in a uniform format. (note: programming of conversion feature is complex)

### **Q 2. To which administrative level (competent authority) the responsibility for operating a WIS may be given? (one authority or each organization is responsible of its part)?**

The establishment of a national WIS is a long-term investment that should benefit a plurality of stakeholders.

When designating (by law) an institution to operate a WIS, several factors must be taken into account (preparation of assessment and recommendation report) that requires a thorough knowledge of the administrative structures and circumstances of the respective country.

Some of the factors are data-related, budgetary, human resources or legal.

In some cases it makes sense or it is necessary to manage data at different administrative levels or institutions (note: if possible, the same data set should not be kept at different levels).

### **Q 3. What are possible difficulties during the developing phase of the WIS?**

### **Q 4. What are some prerequisites for establishing a WIS?**

A multitude of challenges have to be mastered in the development and operation of a WIS. Some of these are listed below and require appropriate enabling environment that are considered prerequisites for its establishment.

#### Institutional

- Lack of legal base → establish legal base
- Willingness of sharing data → establish cooperation

#### Legal



- Data confidentiality for various reasons: e.g. statistical, economic, defence, data privacy protection. → is often a limiting factor

#### Technical

- Coordination of the development of interfaces for data exchange (Note: interface have to be developed on the (new) WIS but also on the (old) data provider system)
- Developing a common understanding about development process (features of the WIS; what can be achieved with the available budget?) → this necessitates the build-up of a team of information technology and water experts
- Data migration: from the old to the new system → this requires thorough preparation of the migration
- Availability of IT expertise in the country for the development (and later for the maintenance of the system!) → often a limiting factor which is difficult to overcome

#### Financial

- Underestimation of development costs → strong cooperation between IT experts and water experts (users of the WIS)
- Missing base line funding for the operation of the WIS! → (1) strong cooperation and interaction between IT experts and water experts (users of the WIS); (2) raising the issue with competent budget unit and securing annual budget before the WIS development.

#### **Q 5. Is all data shared free? Is it possible to have an online payment system?**

Technically, a payment system is possible. However, the administration of the system probably cause more costs than revenues.

- Question to ask: Who are the potential buyers, how many they might be and how often they would request/need data and to which extent?
- Need to provide a justification for the payment system especially that data collection, processing and provision is already paid by public money. An important question to answer is: What added value the institution is providing that justifies the request for payment?

Note: Free access to data (WIS) facilitates the development of the water sector and reporting.

#### **Q6. What should be the geographical unit for this management, knowing that in some cases the same basin follows two different districts, and we have many inter basins transfer?**

This is related to the questions on who should administrate WIS.

Technically it can be solved in every WIS through the user rights concept: making differentiation between geographical and administrative responsibility.

For Example, Austria has one national administration level and nine Federal States (FS). Data are generated in a monitoring programme by the national administration and the FS who upload data in the same data base. While a nationally managed sampling site is located geographically in one FS, the use right for managing data is given to a staff member of the national ministry.



**Q 7. Is the establishment of a WIS in a multi-level governance structure more demanding than in a centralized governance structure (in regard to competence and budget of administration)?**

Yes it is. This is not specific for WIS but to multi-level governance per se.

However, it might be more cost-effective within multi-level governance structure to establish (in cooperation with the respective stakeholders) and operate a central WIS. The cost for the higher coordination will be balanced out by saving on (duplicated) the development and operation costs at multiple stakeholder premises.

**Q 8. What legislative amendment should be made to make a WIS achievable?**

This is determined by the national legislation which defines the work of public administration.

In any case, a legal basis is required (that guarantees the long-term operation of the WIS).

The above should also address the problems related to the absence of "Data sharing policy...", difficulty to acquire data in many times" and lack of "defined role of each institution (More than one institution perform the same role), and "exchange of data between them which leads to duplication of data" presented in Annex 5.1; bullets 1, and 2..

**Q 9. How to insure the quality of data shared on the system?**

WIS can include data validation tools which check

- data format
- plausibility checks

Also the introduction of a national data dictionary facilitates the improvement of data quality as misunderstanding on the side of the data provider will be reduced

This answer also responds to the problem of "Unreliable data, in addition to many data gaps" presented in Annex 5.1,

**Q 10. How to manage multiplicity of data produced by different organizations especially that they come in different formats and quality**

One task in the development of the WIS it is to determine which data formats can be uploaded to an interface. The interface can be programmed to support various data formats.

Adaption of an existing interface to enable a new data format is possible but most time technically more demanding and connected with higher costs than considering it at the beginning.

However, it is suggested to develop and agree on a national data dictionary (enacting an ordinance might be required). This responds to the problem of un-standardised Data collection and the use of different software)

An example of the description of a data dictionary is given in the following link:

<http://dd.eionet.europa.eu/documentation/doc1>

The web link below gives an example for the description of a parameter State of Environment reporting on Water Quality):

<http://dd.eionet.europa.eu/datasets/3163>



**Q 11. How to display all data that are originally in different forms and formats in a proper and understandable manner?**

The WIS can be programmed to convert data formats into required formats which are a complex development process and connected with additional cost.

The introduction of a data dictionary makes it possible to reduce ambiguities.

**Q 12. How to manage sharing this data to public not just between organizations?**

A task in the development of the WIS is to determine which users will be allowed to do what (administration, upload, download or see data and other information ...). The users will be grouped in user groups and it will be specified which rights each user group has. One user group might be the public user.