Report on the Training Workshop with the competent authorities on the process of designing measures and policy targets at the local/decentralized level

SWIM and Horizon 2020 Support Mechanism

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1	Report on the Training Workshop with the competent authorities on the process of designing measures and policy targets at the local/decentralized level	Maggie Kossida, Non-Key expert Programmes of Measures	Suzan Taha, Key water expert

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ACKNOWLEDGEMENTS

DISCLAIMER:

ABBREVIATIONS

BMLWE	Beirut-Mount Lebanon Water Establishment
CAS	Central Administration of Statistics
FAO	Food and Agriculture Organisation
LARI	Lebanese Agricultural Research Institute
LWP	Lebanon Water Project
MoA	Ministry of Agriculture
MoEW	Ministry of Energy and Water
MoE	Ministry of Environment
MoI	Ministry of Industry
NWIS	National Water Information System
RB	River Basin
WE	Water Establishment

1.   INTRODUCTION

The current report is related to the SWIM-H2020 SM expert facility activity EFS-LB-1: "IWRM at the river basin scale, with a focus on capacity building and implementation aspects" and builds on the respective Project Identity Form (PIF). The activity falls under the SWIM theme "Decentralized water management and Growth" and aspires overall to support aspects of policy development and reform, and to provide institutional training, technical assistance and capacity building, through a series of sub-activities. The report presents the outcomes of the 1-day training workshop conducted with stakeholders from competent authorities, organized in cooperation with the Ministry of Energy and Water (MoEW), on the process of designing measures and policy targets at the local/decentralized level. The works carried out in the Nahr El-Kelb pilot river basin has been used as an example.

1.1   BACKGROUND OF THE ACTIVITY

The SWIM-H2020 SM specific activity EFS-LB-1: "IWRM at the river basin scale, with a focus on capacity building and implementation aspects" aims to develop a bottom-up approach for designing and implementing Programmes of Measures (PoMs) at the River Basin scale, based on the assessment of water availability and demand. The Nahr El-Kelb River Basin has been selected as a pilot for that purpose. The work involved the development of a physical-based semi distributed water resources management model of the Nahr El-Kelb using the WEAP21 software. This model has been used to conduct a policy relevant assessment of the water resources and water balance in the basin (looking at both water demand sectors and supply sources), and to further simulate and test a bundle of measures (water saving and increase supply related options) with the purpose of selecting the most cost-effective ones, and subsequently defining relevant policy targets (on the basis of specific criteria) for water conservation, water reuse, etc. The measures to be simulated have been selected in agreement with relevant stakeholders through a participatory approach (involving 2 Consultation Workshops), while the measures' cost-benefit functions have been subject to a design process. The final goal of this pilot study was to communicate the policy targets, which have been defined through a Consultation Workshop with the stakeholders, upstream to the central decision-making level (i.e. the Ministry) with the purpose of being integrated into development frameworks and action plans related to the Water Law (and other sectors).

This bottom-up process in developing PoMs in Nahr El Kelb River Basin is intended to act as a pilot application, to be replicated in other River Basins, so that systematic information on needs and remedies is communicated from the local level to the central level, and this information can be adopted and updated in view of future changing conditions (socio-economic, climatic, etc.) to better inform the national water policy. In this context, the current training workshop was organized with the purpose to build capacity of the participants on the process of designing measures and policy targets at the local/decentralized level.

2.   OBJECTIVES OF THE ACTIVITY

The general objective of this training workshop is to bring together stakeholders from competent authorities who are involved in water allocation, management and planning at the decentralized level (e.g. river basin level, local level, etc.) and train them in the process of designing measures and policy targets at the local level. The focus will be on measures which can reduce the problem of unmet demand, yet the generic methodology can also be applied in other cases (e.g. measures for water quality). Unmet demand is the result of the imbalance between water demand and water availability, when demand exceeds the availability of water resources. To mitigate this problem a variety of measures (technical, institutional, economic, etc.) can be implemented, opting to either reduce demand (i.e. water saving measures), or increase supply (i.e. wastewater reuse, rainwater harvesting, etc.), and/or both, each one having relevant costs and benefits. A bundle of such measures will be presented to the workshop participants, along with the process of selecting candidate measures, assessing their cost-effectiveness functions, simulating the measures prior to implementation, and defining relevant policy targets and a Programme of Measures. The overall goal of the workshop is to increase the understanding of the participants with regards to the importance of ex-ante assessment and public consultation when evaluating measures, and to increase their capacity in designing Programmes of Measures (including ex-ante evaluation) and defining policy targets based on a stepwise participatory process.

To achieve these objectives, the workshop's format was planned to beinteractive, making use of the knowledge and expertise of the participants, including knowledge infusion, structured interactive discussion and practical exercises, and has been structured in two parts:

Part 1:

- Presentation on methods and tools for assessing water budgets at the river basin scale
- Practical exercise (in small groups)

Part 2:

- Presentation on the process for designing demand management measures and ex-ante assessing their effectiveness
- Overview of the example of the Nahr El-Kelb pilot river basin
- Interactive discussion on the process of defining targets and measures (applicability, constraints, acceptability, legal and/or economic barriers, implementability, etc.)
- Participatory exercise (defining policy targets and Programme of Measures (PoM))

Relevant Input Questionnaires (IQ) have been distributed and collected by the Consultant during the workshop to facilitate the participatory process of the workshop.

3.   RESULTS OF THE WORKSHOP

The main outcomes of the workshop are presented below:

1. Participants have gained an understanding of the importance of ex-ante assessment and public consultation when evaluating measures
2. Participants have gained valuable knowledge on the process of designing and selecting demand management measures based on cost-effectiveness functions and ex-ante assessment, and have been showcased with a relevant case study in the Nahr El-Kelb River Basin
3. Participants increased their knowledge on how to define policy-relevant targets and Programmes of Measures based on a stepwise participatory process.
4. Participants gained knowledge on how to perform water balance calculations, and what tools can be used to facilitate this process
5. Participants shared knowledge and experience on the current availability and structure of the water use data in Lebanon, and the discussed the needed improvements in the prevailing data collection and dissemination process of water use data (participatory exercise)
6. Policy-makers (MEW, MoE, MoA), government agencies in charge of water distributions (BMLWE), municipality representatives and donor/development agencies (LWP/DAI) engaged into a common dialogue

3.1 KEY ELEMENTS OF THE PRESENTATIONS AND DISCUSSION POINTS

3.1.1 Measures to reduce unmet demand in the Nahr El-Kelb river basin: insight into the simulation process implemented

The objective of this presentation was to was to showcase to the participants different demand management measures and options for the urban and agricultural sectors, targeting to introduce water saving or increase water supply, along with a methodology for ex-ante assessing the cost-effectiveness of these measures. The work in the Nahr El-Kelb River Basin has been used as an example. The measures included water saving fixtures, domestic greywater reuse, on-site rainwater harvesting, increasing irrigation efficiency (both field application and conveyance efficiency), precision agriculture, natural water retention measures (e.g. detention and retention ponds),

The participants were introduced to the overall methodological process to be followed when designing demand management options. The methodological process entails the following 5 steps:

- Step 1 – Policy Assessment: Policy relevant assessment of the water balance and unmet demand (per sector) in the area of interest based on the results of detailed water balance models and calculations
- Step 2 – Identify demand management options: Identification of potential demand management (including increase supply) measures for the most important sectors (e.g. urban and agricultural sector)
- Step 3 – Discuss and screen options: First dialogue with the stakeholders: presentation of the measures, discussion on their efficiency and implementability, identification of limitation, agreement on a list of " candidate measures

- Step 4 – Assess costs and benefits: Simulation of the performance "candidate measures" against a physical-based model to assess their cost-benefit
- Step 5 – Prioritize and set targets: Second dialogue with the stakeholders: presentation of the modeled/ simulation outcomes, agreement and prioritization of measures based on specified criteria (PoM), setting of targets

Details were presented on how to simulate the expected benefits and related costs of each measure/ option and develop on this basis cost-effectiveness functions, which can then be used in an optimization process in order to select the optimum solutions.

The discussion with the participants also focused on practical issues and questions in relation to the implementability, acceptability, constraints, etc. of each measure and/or bundled of measures. Namely, the following questions have been discussed for each measure, as key questions that need to be addressed in an open consultation with stakeholders when designing measures:

- Is this measure desirable? Yes/ No, Why?
- Is this measure feasible? Which areas do you consider as priority areas for implementing the measures?
- Which of the available products (presented during the workshop) do you think might make more sense to install (e.g. low flush toilets, showerheads, aerators, etc.)?
- In which setting (e.g. type of building) do you think this measure might be more applicable?
- Which are the stakeholders and authorities to be involved in the implementation of the measure?
- Do you think this measure has the potential to bring good benefits? Why?
- Can you identify any main constraints (social, economic, environmental, other) which would challenge the implementation of this measure? Which ones? Why?
- Can you think of potential funding mechanisms for this measure?
- On a scale from 1 to 5 (1=lowest importance, 5=highest importance) how would you rate this measure regarding its prioritization? Why?

The following challenges have been identified during the dexchanges:

- Limited knowledge exists on the actual effectiveness of the implemented measures
- Socio-economic constraints often limit the implementation of measures, be it the lack of funds and/or high implementation costs, or the lack of awareness, the unwillingness of the society to apply the measures and their public rejection and non-acceptability
- Administrative constraints are also frequent, and relate to logistics, and the lack of concrete plans or institutional procedures
- Environmental constraints also apply in some cases, mostly when it comes to infrastructure for increasing water supply

3.1.2 Methods and tools for assessing water budgets at the river basin scale

The objective of this presentation was to assist the participants in understanding the basic components of the water budgets (natural and anthropogenic) and showcase different tools that can

be used for their estimation. The policy relevance of developing water budgets at the decentralised level has also been explained. The basic definition of the water budget components have been presented, as well the basic underlying equations. The following key elements have also been highlighted:

- When selecting an accounting unit for developing a water budget, the careful selection of boundaries can greatly facilitate the accounting process
- When developing water budgets there is often a mismatch of scales (i.e. the hydrological boundaries do not coincide with the administrative boundaries)
- Water quality poses additional constraints to water availability since its limits some uses, and thus needs to be considered
- Accurate measurements and/or estimates are important, yet often difficult to obtain (e.g. illegal abstractions)
- All water-budget calculations contain some uncertainty. There are two general sources of this uncertainty: natural variability of the hydrologic cycle and errors associated with measurement techniques

The discussion focused on the current status of development of water budgets at the decentralised level in Lebanon and their importance when drafting River Basin Management Plans. It has been identified that:

- The proper quantification of the components of water balance is the foundation of effective water management and environmental planning and an indispensable input for the drafting of the River Basin Management Plans. It is acknowledged that this process is challenging and thus robust modelling frameworks are necessary to support the process.
- Currently, few river basins in Lebanon (e.g. Litani) have detailed water budget calculations. Data availability is often an issue.
- The evaluation of the water balance and the comparison of the water demand against the water availability at various spatio-temporal scales are important in assessing the level of pressures exerted by human activities on the natural water resources of a particular area, the prevailing water stress conditions, and the sustainability of the various economic activities. Combined with future projections (both of water demand and water availability as also influenced by climate change), this evaluation supports proper water allocation and the design of adequate Programmes of Measures to mitigate any adverse impacts.

3.2 RESULTS OF THE PARTICIPATORY EXERCISE ON DATA COLLECTION

During the workshop an introductory presentation on understanding on the definitions and typology the various water uses and internationally accepted methods and proxies for estimating water use in the domestic, industrial, irrigation and thermoelectric power production sectors was given. A discussion was held on the current state of estimating, monitoring and reporting the various water use categories in Lebanon. The participants have been divided in 3 groups and have been asked to perform a

practical exercise on how to identify and retrieve water use data for the urban, industrial and agricultural sectors, comment on the main constraints and suggest ideas for an improved data collection process The results of this participatory exercise are presented below, for each water use category separately.

3.2.1 Water Use Category: Domestic

1. What are the main sources of water for this water use, and which public entities are responsible for the distribution of water for that water use?

Distributor ➡ Source:	Public Water Supply (PWS)	Self-supply	Other
from surface water	Yes Whom: Water Establishments (WE)		
from groundwater	Yes Whom: Water Establishments (WE)	Yes, from private wells	
Saline water			
Reclaimed Wastewater (non-treated)			
Treated Wastewater	It is planned for the futur Whom: Water Establishments (WE), MEW		
Desalination			
Rainwater harvesting		Yes	
Other source (specify): Greywater		Planned for the future	

2. Is this water use currently measured (e.g. with water meters) or estimated (e.g. with proxies, coefficients, etc.)?

	Yes/ No	By whom?	How often?	How is it measured or estimated?
Measured	▪ Some water meters, in some areas (e.g. Hamra district, Tripoli – Mina city, some regions in Sinai, some villages in Khoura, Kesrwan) ▪ Gages (at the entry of each house)	Water Establishments (WE)	About every 3 months (lack of personnel)	▪ Readings from the meters (in the North they plan to have smart water meters at each house) ▪ The provision is 365 m3 per year (i.e. 1 m3

				per day) for a flat rate of 200 USD (~300,000 LBP) per year. This volume is stored in a reservoir in the roof. Due to pressure issues the actual volume maybe less water. Flat fixed tariff 300,000 LBP/yr in Beirut
Estimated	Volume supplied minus leakage/losses Meters on the water sources Based on subscribed users, every house less than 200sq.m needs 1m3/day (4.6 people per hh)	Water Establishments (WE)	daily	

3. Select the appropriate/ meaningful scales of the data collection (DCP) that you want to design. These scales must be disaggregated (e.g. monthly, municipality, etc.). Of course, you have to compromise here the high resolutions with the data availability

	Preference 1	**Preference 2**	**Preference 3**
Spatial scale	Municipality (to assume more roles and collect the tariffs, cooperation with WE)		
Temporal scale	3-months	Monthly	Daily for leakage purposes

4. What type of data do you need for your DCP?

Data category	**Who collects these data?**	**How often are these data collected?**	**Who holds these data? Is it the same entity that collects them?**	**At what scale (spatial / temporal) are these data currently available?**
a) inventory of sources of water	MEW, WE	yearly	WE, MEW	Per source
b) abstraction volumes per source	MEW, WE (data loop: WE to send the data back to MEW)	3-months 6-months	WE, MEW	Per source
c) water supply	WE	3-months	WE	Per area ▪ In rural areas per municipality

				▪ In urban areas per reservoir coverage area (e.g. 3 in Beirut)
d) water use	WE	3-months	WE	Per municipality
e) No of subscribers (and relevant info on type of building, categories, hh size)	WE	Yearly	WE	Per municipality
f) water quality of the abstracted water	WE Laboratory	3-months 6-months	WE	Per source
g) water quality sampling at the household gauge (survey)	WE Laboratory	6-months	WE	Per subscriber (selected)
h) survey on micro-components of domestic water use	WE Laboratory	pilot	WE	Per subscriber (selected)

5. What type of ancillary data (e.g. population, irrigated acres per crop, etc.) do you need for your DCP? These are important in case you want to use proxies to estimate the water use.

Data category	Who collects these data?	How often are these data collected?	Who holds these data? Is it the same entity that collects them?	At what scale (spatial / temporal) are these data currently available?
a) population	Ministry of Interior, Ministry of Social Affairs, Municipalities, Central Administration of Statistics (CAS)	3-5 years	Ministry of Interior, Ministry of Social Affairs, Municipalities, Central Administration of Statistics (CAS)	Municipality
b) domestic greenspaces (backyards)	Municipalities GIS, Earth Observation data agents	n/a	DG Urban Planning	municipality

6. Briefly describe a suggested data collection and reporting schema (*e.g. X entity collects and quality checks the data every month, and sends them to X entity, who aggregates them at X level and sends them to the MWRI, CAPMAS, etc….*)

There is a National Water Information System (NWIS) and a Data collection Committee, but currently a data flow description is lacking

Example from the North Lebanon Water Establishment: data collection with GIS and GPS to track the leakage (real-time data). Data are collected on the number of subscribers, type of building etc.

7. Briefly describe the main constraints, expected problems, etc., that you think you will confront in the Data Collection Process (DCP). List any ideas how to overcome them.

- Procedures to coordinate all entities (more than 18 entities produce and/or use data) are lacking
- There is no defined process to enforce the data producers to give the data to the NWIS. It is suggested that the High Council of Water develops a relevant protocol on this and a mandate
- There is a mentality to pay for getting data, whereas they should be free
- Shortage of staff/ limited human resources

8. Please suggest a pilot area where a pilot Data Collection Process (DCP) could be tested. This area may be a significant water user of this category, or an area where some good infrastructure already exists, or an area with low complexity, etc. Please justify why have you selected this pilot area?

Hamra, or any other place where we have complete meters, especially smart meters

9. Any remarks, comments?

3.2.2 Water Use Category: Manufacturing Industry

1. What are the main sources of water for this water use, and which public entities are responsible for the distribution of water for that water use?

Distributor ➡ Source:	Public Water Supply (PWS)	Self-supply	Other
from surface water	Yes Whom: Water Establishments (WE)	Yes	
from groundwater		Yes	
Saline water	Only for electricity production plants	Yes	
Reclaimed Wastewater (non-treated)	In limited areas	Yes	

Treated Wastewater			
Desalination		Yes, in rural areas	
Rainwater harvesting			
Other source (specify)			

2. Is this water use currently measured (e.g. with water meters) or estimated (e.g. with proxies, coefficients, etc.)?

	Yes/ No	By whom?	How often?	How is it measured or estimated?
Measured	No			
Estimated	Yes	By the users	unknown	

3. Select the appropriate/ meaningful scales of the data collection (DCP) that you want to design. These scales must be disaggregated (e.g. monthly, municipality, etc.). Of course, you have to compromise here the high resolutions with the data availability

	Preference 1	Preference 2	Preference 3
Spatial scale	Municipality		
Temporal scale	monthly		

4. What type of data do you need for your DCP?

Data category	Who collects these data?	How often are these data collected?	Who holds these data? Is it the same entity that collects them?	At what scale (spatial / temporal) are these data currently available?
a) Type of industries	Ministry of Industry (MoI), MEW	Monthly	MEW, WE	Municipality
b) water demand	WE	Monthly	MEW, WE	
c) water source	WE, MEW	Monthly	MEW, WE	
d) water quality	WE	Monthly	MEW, WE	
d) water discharge/ effluent	WE, MEW	Monthly	MEW, WE	
e) effluent outlet	WE, MEW	Monthly	MEW, WE	
f) effluent treatment system	WE, MEW			

5. What type of ancillary data (e.g. population, irrigated acres per crop, etc.) do you need for your DCP? These are important in case you want to use proxies to estimate the water use.

Data category	Who collects these data?	How often are these data collected?	Who holds these data? Is it the same entity that collects them?	At what scale (spatial / temporal) are these data currently available?
a) type of production	Ministry of Industry (MoI)	Monthly	Ministry of Industry (MoI)	

6. Briefly describe a suggested data collection and reporting schema (e.g. X entity collects and quality checks the data every month, and sends them to X entity, who aggregates them at X level and sends them to the MWRI, CAPMAS, etc….)

The first thing to do it to elaborate a protocol to produce data, to collect and distribute them to other involved entities and officially to the MEW and the Water Establishments (WE)

7. Briefly describe the main constraints, expected problems, etc., that you think you will confront in the Data Collection Process (DCP). List any ideas how to overcome them.

- Shortage of staff and lack of tools that can facilitate the execution of their tasks

- Private wells are not always licensed

- The water licenses should include: water quantity (meters), source of water, water quality at use, effluent quantity and quality, effluent treatment system

8. Please suggest a pilot area where a pilot Data Collection Process (DCP) could be tested. This area may be a significant water user of this category, or an area where some good infrastructure already exists, or an area with low complexity, etc. Please justify why have you selected this pilot area?

Begaa Water Establishment or North Lebanon Water Establishment

9. Any remarks, comments?

3.2.3 Water Use Category: Agriculture

1. What are the main sources of water for this water use, and which public entities are responsible for the distribution of water for that water use?

Source: ➡ Distributor	Public Water Supply (PWS)	Self-supply	Other
from surface water	Yes (springs, some dams that have dual use) Whom: MEW and Municipalities	Yes, from springs	
from groundwater	Yes Whom: WE (license from MEW)	Yes, from wells (license from MEW)	
Saline water		Yes, from private wells	
Reclaimed Wastewater (non-treated)			
Treated Wastewater	Not currently, planned for the future		
Desalination			
Rainwater harvesting	Yes (in some Municipalities) Whom: Municipalities	Yes, from Hill lakes	
Other source (specify)			

2. Is this water use currently measured (e.g. with water meters) or estimated (e.g. with proxies, coefficients, etc.)?

	Yes/ No	By whom?	How often?	How is it measured or estimated?
Measured	Yes, the abstraction volumes *Note: a lot of people use potable water to irrigate*	WE	Weekly, Monthly	
Estimated	Crop water needs, multiplied by the irrigated areas per crop	Lebanese Agricultural Research Institute (LARI), MoA	Not systematic	Based on the number of irrigated ha per crop type. *Note: The water tariff is per hectare*

3. Select the appropriate/ meaningful scales of the data collection (DCP) that you want to design. These scales must be disaggregated (e.g. monthly, municipality, etc.). Of course, you have to compromise here the high resolutions with the data availability

	Preference 1	Preference 2	Preference 3
Spatial scale	Municipality	Locally in every village	
Temporal scale	3-months (seasonal)		

4. What type of data do you need for your DCP?

Data category	Who collects these data?	How often are these data collected?	Who holds these data? Is it the same entity that collects them?	At what scale (spatial / temporal) are these data currently available?
a) water use per municipality	WE	2 times per year, or 1 per year in big farms	WE	Farm level, and subscriber level
b) number of irrigated hectares per crops	MoA			
d) Water abstraction for irrigation				
e) Effective rainfall to calculate irrigation water needs				
f) data on crop yields, crop production	National Center of Remote Sensing			
g) Irrigation methods				

5. What type of ancillary data (e.g. population, irrigated acres per crop, etc.) do you need for your DCP? These are important in case you want to use proxies to estimate the water use.

Data category	Who collects these data?	How often are these data collected?	Who holds these data? Is it the same entity that collects them?	At what scale (spatial / temporal) are these data currently available?
a) Farm survey every 10 years (crops planted, irrigation method, water source,	MoA jointly with FAO	1 in 10 years, 1 in 5 years. Every year there is a sampling for some areas (the representative big	Every district has a Regional Center (Agricultural Center of the MoA) that does inspections to	Farm level

etc.)		farms, and for houses with more than 1 km2 farm)	update the information	

6. Briefly describe a suggested data collection and reporting schema (*e.g. X entity collects and quality checks the data every month, and sends them to X entity, who aggregates them at X level and sends them to the MWRI, CAPMAS, etc….)*

Run the MoA Farm Survey every 5 years, in cooperation with the MEW, and add more questions (e.g. on quantity) additional to the source and irrigation method. Also involve and get help from the Municipalities.

7. Briefly describe the main constraints, expected problems, etc., that you think you will confront in the Data Collection Process (DCP). List any ideas how to overcome them.

- Shortage of staff and lack of tools that can facilitate the work

- Limited number of inspections

- Sometimes the people are not very serious/ accurate when they give information to the surveys (need to increase awareness!)

- In some cases farmers irrigate with potable water and pay per volume!

8. Please suggest a pilot area where a pilot Data Collection Process (DCP) could be tested. This area may be a significant water user of this category, or an area where some good infrastructure already exists, or an area with low complexity, etc. Please justify why have you selected this pilot area?

- Nahr Ibrahim (good pilot due to multiple water uses: electricity generation water use + irrigation water in the agricultural areas + domestic water use in the villages)

- Kasrwan area

9. Any remarks, comments?
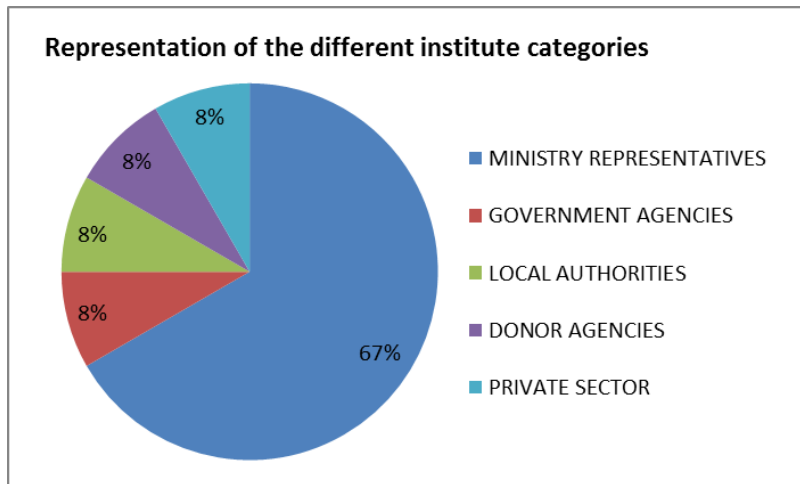
4.   PROFILE OF THE PARTICIPANTS

The audience included technical staff from authorities involved in the water allocation, water distribution/ supply and water management at the decentralized level (river basin level, local level), as well as authorities involved in the decision-making and planning of measures at the local and central level, namely the Ministry of Energy and Water (MEW), the Ministry of Environment (MoE), the

Ministry of Agriculture (MoA), the Beirut-Mount Lebanon Water Establishment (BMLWE), the Municipality of Jeita, and the Lebanon Water Project/DAI (LWP/DAI) development agency.

Regarding the participants' demographics, a total of 12 participants attended the workshop (for a detailed participants' list refer to Annex 7.2), of which 67% women and 33% men, and with the following institutional mix: 67% from ministries, 8% from government agencies, 8% from local authorities, 8% from donor agencies, and 8% from the private sector.

Figure 4-1: Representation of the different institute categories in the workshop

5. EVALUATION OF THE EVENT

5.1 RESULTS OF THE EVENT

A. Organisational, administrative and planning issues before and during the event

A set of 11 criteria (A1-A1 see table below) have been assessed by the participants, using a qualitative description ranging between "Excellent" to " Poor", with an opportunity to provide suggestions for improvement. For the sake of comparison, the qualitative descriptions are given Series Numbers as follows:

Excellent = 4   Good = 3   Average = 2   Poor = 1

A1	Appropriate handling of invitations, visa support, information sharing and smoothing obstacles
A2	Efficient logistics: accommodation, transportation, location of venue and interpretation (where applicable)
A3	Provision of support (if requested) for participants' preparation for the event
A4	Efficient and effective follow-up of preparations and progress towards the event

A5	Planning of the event: selection and design of methodology, programme/ daily agenda and work rules
A6	Smooth flow of programme, efficient handling of emerging needs and attentiveness to participants concerns
A7	Adequacy of the presentations (Presentations correspond and contribute to the planned objectives and are conducive to enhanced shared understanding and participation on addressed topics)
A8	Clarity, coverage and sufficiency of concepts, objectives, anticipated outputs
A9	Usefulness of the distributed material
A10	Efficiency and effectiveness of the facilitation
A11	Overall rating of the event

The results of the assessment for each criterion are presented in the table below and in the following graphs (per criterion).

Table 5-1: Results of the assessment (rating) of the organisational, administration and planning aspects of the workshop

No.	Criterion	Average score
A1	Appropriate handling of invitations, visa support, information sharing and smoothing obstacles	2.83 / 4
A2	Efficient logistics: accommodation, transportation, location of venue and interpretation (where applicable)	3.22 / 4
A3	Provision of support (if requested) for participants' preparation for the event	3.13 / 4
A4	Efficient and effective follow-up of preparations and progress towards the event	3.44 / 4
A5	Planning of the event: selection and design of methodology, programme/ daily agenda and work rules	3.20 / 4
A6	Smooth flow of programme, efficient handling of emerging needs and attentiveness to participants concerns	3.40 / 4
A7	Adequacy of the presentations (Presentations correspond and contribute to the planned objectives and are conducive to enhanced shared understanding and participation on addressed topics)	3.40 / 4
A8	Clarity, coverage and sufficiency of concepts, objectives, anticipated outputs	3.50 / 4
A9	Usefulness of the distributed material	3.20 / 4
A10	Efficiency and effectiveness of the facilitation	3.40 / 4
A11	Overall rating of the event	3.50 / 4

Figure 5-1: Rating of the organizational and administrative aspects on the workshop
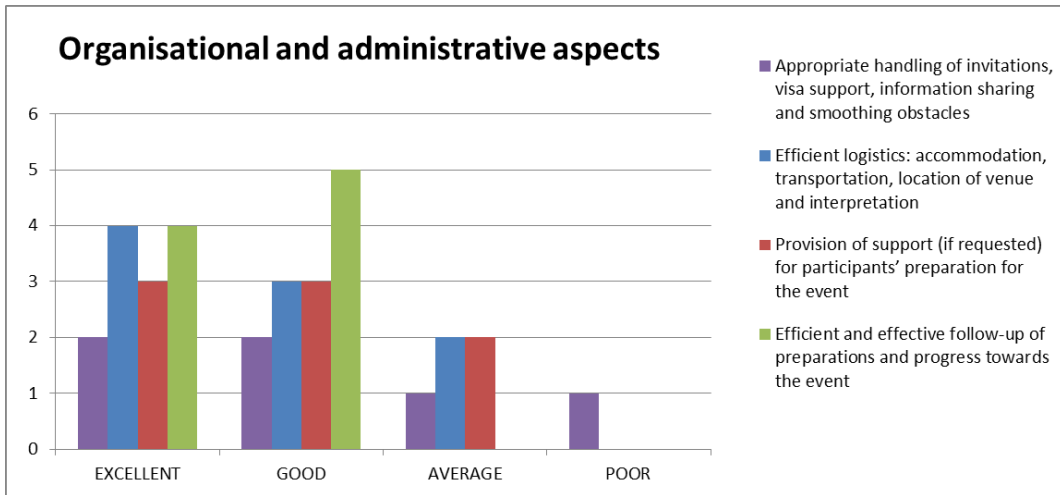

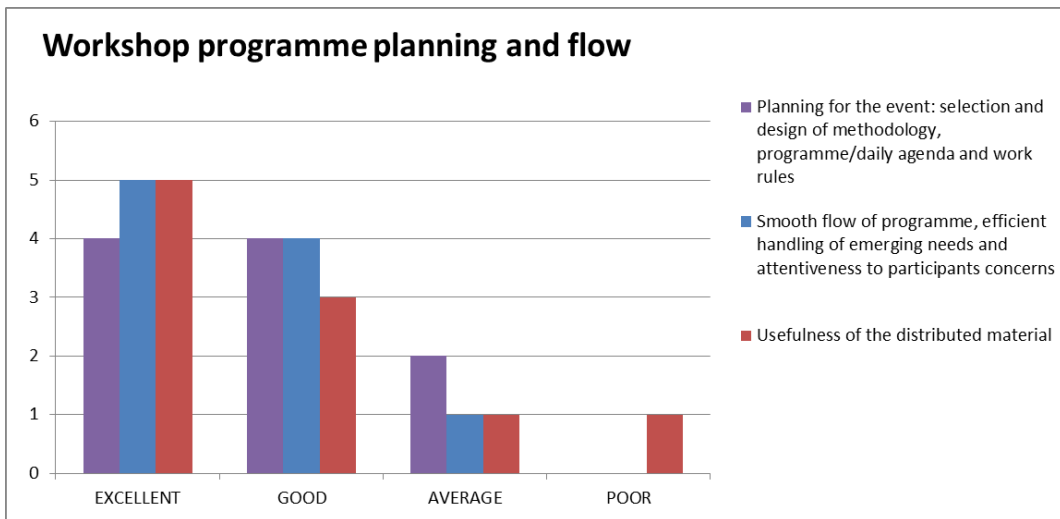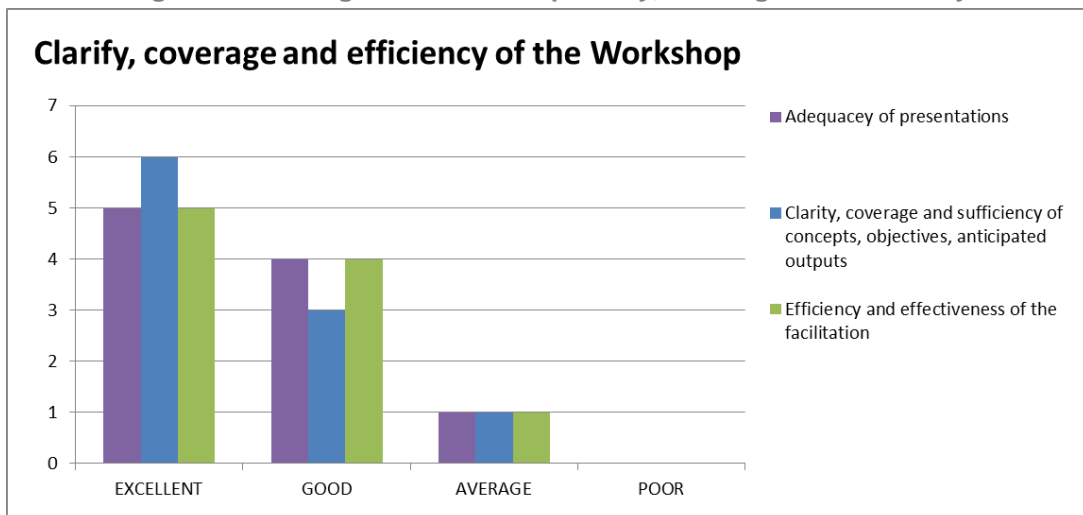**Figure 5-2: Rating of the workshop programme planning and flow**

Figure 5-3: Rating of the workshop clarity, coverage and efficiency

### B. Feedback by participants on technical aspects:

Coverage of the event: Regarding the event coverage evaluation, 50% of the participants felt that all the topics necessary for a good comprehension of the subject (and nothing more) were covered, 20% felt that some topics covered were not necessary, and 30% felt that some additional topics should be included.

Figure 5-4: Rating of the workshop coverage
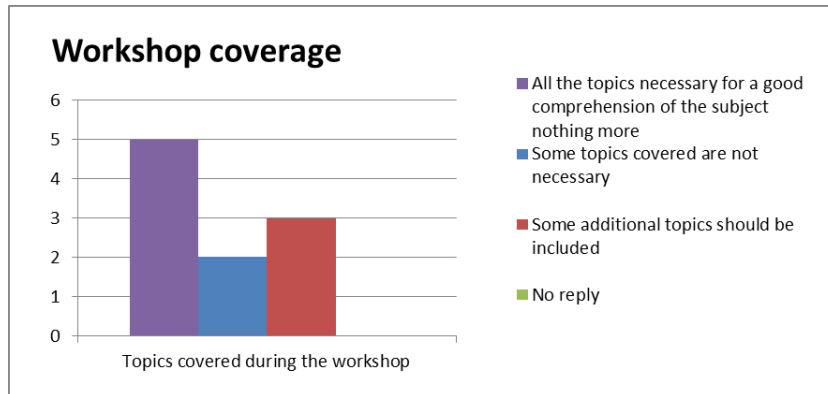
Level of difficulty: Regarding the evaluation of the level of difficulty of the workshop, 100% of the participants reflected it was adequate.

Figure 5-5: Rating of the level of difficulty of the workshop
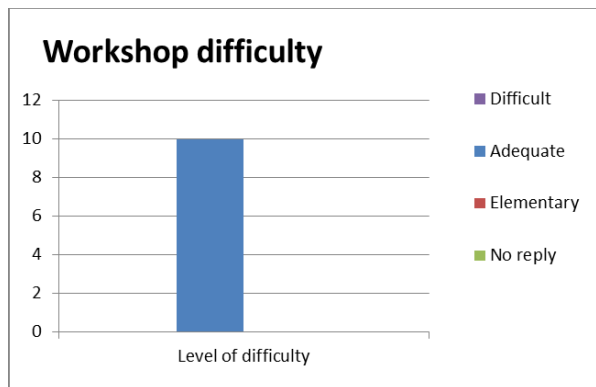
Length of the workshop: Regarding the workshop duration, 70% of the participants thought it was sufficient, 10% thought it was longer than needs, and 20% thought it was shorter than required.

Figure 5-6: Rating of the workshop length
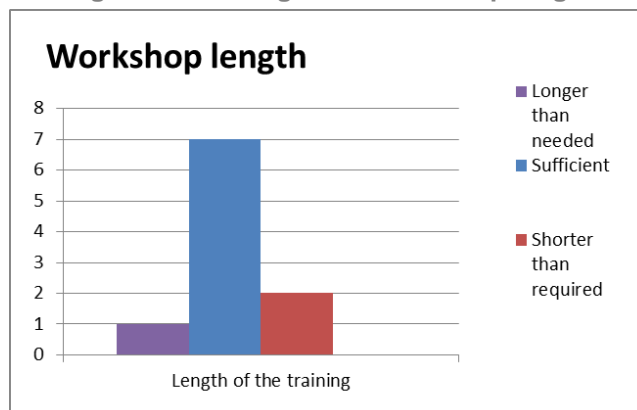
What is the most valuable thing you learned during the workshop (knowledge or skills)? The following answers have been provided by the participants:

(a) The variety of water saving measures and types (tier-1, tier-2)

(b) The planning of a data collection process in the various water use sectors and related public entities

(c) The methodologies presented for collecting and organizing the data and information at river basin scale

(d) Important measures to be implemented according to each sector

(e) How to develop water budgets

(f) Water management and water saving methods

(g) That we need to seriously consider this important resources: the water

How do you think that the current event will assist you in your future work on the subject? The following answers have been provided by the participants:

(a) Taking into consideration the water savings in our future studies

(b) Establishing strategies in relation to water use and water savings (sustainable development) in environmental studies related to the water sector

(c) Having now the knowledge and references on who is responsible for what

(d) In developing new water management ways

(e) In organizing water management at the river basin scale through River basin Organizations

Please indicate whether (and how) you could transfer part of the experience gained from the event to your colleagues in your country. The following answers have been provided by the participants:

(a) By sharing the workshop presentations and documents

(b) Yes, through environmental policy for water in Lebanon and Strategic Environmental Assessment

(c) By organizing a small presentation on the workshop topics

(d) By using the material we worked on during the workshop

(e) By discussing the workshop outcomes with colleagues in the Ministry

(f) In the implementation of the new Water Law (77) which has foreseen the development the River Basin Organizations, and in the development of the relevant application decree

(g) By sharing and transferring the new ideas learned

What did you like most about this event? The following answers have been provided by the participants:

(a) The interactive dialogue during the presentations

(b) The training sessions

(c) The presentations about the water saving measures, and how to assess their cost-effectiveness and applicability

(d) The working groups

(e) The discussions

(f) The exchanges and the interaction of all the participants

(g) The motivation and willingness of the trainer and the organizer

What needs to be improved? The following answers have been provided by the participants:

(a) Nothing

(b) More applications and WEAP exercises

(c) The material

(d) Extend the workshop duration

(e) Highlight to the different participating organizations and Ministries to allocate in the workshop staff who are experienced along with junior staff

(f) Decrease the time allocated to the participatory exercises

6. CONSLUSIONS & OVERALL ASSESSMENT

The workshop objectives have been met as the participants have gained an improved understanding on the process of designing demand management measures and policy targets at the local/decentralized level, and how to conduct a relevant ex-ante evaluation of the cost-effectiveness of the measures. Furthermore, they learned about a variety of water saving options and technologies for the domestic and agricultural sectors. Finally, they gained knowledge on the importance of having water budgets at the river basin scale and on how to develop them, and on how to design a data collection on water use data for the various sectors through a hands-on practical exercise.

One of the success elements of this workshop, which has been acknowledged by the participants, was that it managed to bring together different stakeholder groups and engage them into a constructive dialogue and a useful exchange of knowledge alongside with the training presentations, which were interactive and promoted bilateral exchanges.

7. ANNEXES

7.1 AGENDA

SWIM-H2020 SM Training Workshop with the competent authorities on the process of designing measures and policy targets at the local/decentralized level

Thursday, March 15th, 2019

09:00 - 09:30	Registration and Coffee
09:30 - 10:00	Welcome & Objectives of the workshop *- Mona Fakih, Director of Water, Ministry of Energy and Water (MoEW), SWIM Focal Point* *- Tour de Table (all participants)*
10:00 - 11:00	Training Session: Methods and tools for assessing water budgets at the river basin scale *- Dr. Maggie Kossida, SWIM-H2020 non-key expert on Programmes of Measures*
11:00 - 11:30	Participatory exercise *(all participants)*
11:30 - 12:00	Coffee Break
12:00 - 12:30	Reporting back from the participatory exercise and discussion
12:30 - 13:15	Training Session: Process for designing demand management measures and ex-ante assessing their effectiveness *- Dr. Maggie Kossida, SWIM-H2020 non-key expert on Programmes of Measures*
13:15 - 14:15	Interactive Discussion on the design of measures (constraints, key issues, etc.) *(all participants)*
14:15 – 15: 15	Participatory exercise (defining policy targets and Programme of Measures (PoM)) *(all participants)*
15:15 - 15:30	Wrap-up, conclusions and next steps Workshop evaluation
15:30 - 16:30	Lunch and Networking

7.2 LIST OF PARTICIPANTS

Table 7-1: List of participants

COUNTRY	TYPE OF INSTITUTION	TITLE (Mr/Ms)	FIRST NAME	LAST NAME	POSITION/ FUNCTION	ORGANISATION/ INSTITUTION	EMAIL
LEBANON	DONOR AGENCIES	Mr	Bassan	Jaber	Ex-General Directors MEW, Senior Advisor	LWP/DAI	bjaber@metgc @gmail.com
LEBANON	MINISTRY REPRESENTATIVES	Mrs	Nisrine	Ghattas	Engineer	MEW	nisrine.ghattas @gmail.com
LEBANON	LOCAL AUTHORITIES	Mrs	Mirna	Seabi	Local Devenopment Agnet	Municipality of Jeita	mirna.seaibi@jei tavillage.com
LEBANON	MINISTRY REPRESENTATIVES	Mrs	Rima	Mahanna	Head of Agricultural Center in Keserwan	MoA Jounieh	rima.mehanna@ gmail.com
LEBANON	MINISTRY REPRESENTATIVES	Mrs	Carine	Khalil	Agricultural Engineer	MoA Jounieh	kiri27m@hotmail .com
LEBANON	GOVERNMENT AGENCIES	Mr	Antoine	Khoury	GIS Analyst	BMLWE	tony-khoury77@hotm ail.com
LEBANON	MINISTRY REPRESENTATIVES	Mrs	Sally	Sassine	Environmental Specialist	MoE	s.sassine@moe. gov.lb
LEBANON	MINISTRY REPRESENTATIVES	Mr	Samer	Al Hachem	Geologist, Environmental Specialist	MoE	s.alhachem@m oe.gov.lb
LEBANON	MINISTRY REPRESENTATIVES	Mrs	Yara	El Moghrabi	Environmental Policy Specialist	MoE	y.elmoghrabi@ moe.gov.lb
GREECE	PRIVATE SECTOR	Mrs	Maggie	Kossida	SWIM Non-Key Expert	LDK	maggie@ldksa.g r
LEBANON	MINISTRY REPRESENTATIVES	Mrs	Mona	Fakih	Director of Water	MEW	monafakih@hot mail.com
LEBANON	MINISTRY REPRESENTATIVES	Mr	Samer	El Husseini	Water Engineer	MoE	samertoo@gmai l.com
LEBANON	PRIVATE SECTOR	Mrs	Diana	Abi-Abboudissa	Interpretor		dianaabiabboud @idm.net.lb
LEBANON	PRIVATE SECTOR	Mrs	Grace	Abou Khaled	Interpretor		aboukhaled_gra ce@hotmail.com