



REPORT

6thSWIM-Sustain Water MED Regional Meeting

8&9th of June, 2014
Bologna, Italy



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List of abbreviations

ABH-SMD	Hydrological Basin Agency of Agadir Morocco
BAU	Al Balqa Applied University (Jordan)
CB	Capacity Building
CITET	International Centre for Environmental Technologies Centre International des Technologies De L`Environnement de Tunis
CP	Counterpart
CRDA	Regional Authority for Agricultural Development, Tunisia
DWWTP	Decentralized Waste Water Treatment Plants
EIA	Environmental Impact Assessment
ENEA	Italian National Agency for New Technologies, Energy and Sustainable Economics
EU	European Union
GAM	Greater Amman Municipality
GDA	Groupement de Developpement Agricole
GIZ HQ	GIZ Headquarter
HCWW	Holding Company for Water and Wastewater
IFAT	Weltleitmesse für Wasser, Abwasser, Abfall & Rohstoffwirtschaft
IUCN	International Union for Conservation of Nature
IWRM	Integrated Water Resources Management
JVA	Jordan Valley Authority
MALR	Ministry of Agriculture and Land Reclamation (Egypt)
MIRRA	Methods for Irrigation and Agriculture (Jordan)
MoA	Ministry of Agriculture(Jordan)
MWI	Ministry of Water and Irrigation (Jordan)
NAW	Nabil Ayoub Wakileh & Co.(Jordan)
NRC	National Research Centre (Egypt)
O&M	Operation and Maintenance
ONAS	National Sanitation Utility Tunisia
PEV	Projekt Evaluierungsvorhaben
PR	Public Relations
PSD	Public Security Directorate (Jordan)
PS	Private Sector
SBR	Sequencing Batch Reactor
SC	Steering Committee
SWIM SWM	SWIM-Sustain Water MED
UFZ	Helmholtz Centre for Environmental Research (Leipzig, Germany)
WAJ	Water Authority of Jordan
NRW	National Water Research Centre (Egypt)
WW	Wastewater
WWT	Waste Water Treatment
WWTP	Waste Water Treatment Plant

Introduction

SWIM-Sustain Water MED is implemented in Egypt, Jordan, Morocco and Tunisia with the objective to improve sustainable integrated management of non-conventional water resources, with emphasis on wastewater treatment and reuse. The project is implemented by a Consortium of 8 partners, with the GIZ as the leading implementation partner. Partners are: Adelphi Research gGmbH, Germany; Italian National Agency for New Technologies, Energy and Sustainable Economics (ENEA), Italy; Water Basin Agency for the Souss-Massa-Drâa region (ABH-SMD), Morocco; National Sanitation Office (ONAS), Tunisia; Holding Company for Water and Wastewater (HCWW), Egypt, Al Balqa Applied University (BAU), Jordan and International Union for the Conservation of Nature (IUCN), Jordan.

The SWIM-Sustain Water MED project began implementation in January 2012. Six regional meetings have been held since, where partners discussed achievements and jointly developed action plans for the coming year. The first was held in December 2012 in Amman/Jordan, the second in May 2013 in Tunis/Tunisia, the third in December 2013 in Berlin/Germany, the 4th in June 2014 in Rabat/Morocco, the 5th from 3-4 Dec 2014 in Sharm EL Sheikh/Egypt and the sixth from 7-11th of June, 2015 in Bologna/Italy.

The meeting in Bologna was organized by the team from ENEA, Roberto Farina, Luigi Petta and Macro Ferraris.

The meeting aimed at:

- Receiving feedback from all partner countries on activities carried out since the 5th RM in June 2014 in Sharm El Sheikh/Egypt and the planned activities until September 2015;
- Reviewing the recommendations and conclusions from the SWIM evaluation that was conducted from October 2014 until May 2015;
- Reviewing and finalizing plans for scheduled activities until September 2015;
- Receiving an update by Ismail Al Baz on follow up plans to SWIM;
- Filling gaps and including lessons learnt and recommendations by participants into the last chapter of the Compendium;
- Introducing and discussing the nexus energy, food and water in relation to SWIM activities in the four partner countries;
- Exchanging experiences and lessons learnt among the SWIM-Sustain Water MED team (peer to peer exchange);

The meeting brought together the SWIM-Sustain Water MED teams from Jordan, Morocco, Egypt and Tunisia, the partners ENEA and Adelphi Research gGmbH and the SWIM-Sustain Water MED coordination team from Amman/Jordan.

1. Welcome and report back on progress since December 2014

1.1. Country update

In the first session each country (Jordan, Egypt, Tunisia, and Morocco) gave a presentation on their achievements to date. The updates are documented below, separately under each country heading.

1.1.1 Jordan

The progress in Jordan was presented by Dr Nasser Almanaseer. He noted that SWIM Jordan is transferring the ownership of the pilot plant to the PSD.

The Current Incoming Flow at the Plant is 70 – 95 m³/day (85 to 95 during the week days and 70 to 80 during the week ends). PSD needs approx. 40 to 45 M³/day (7 days a week). Excess treated WW (30-50 m³/day) will be used by the Greater Amman Municipality (GAM) and an agreement is currently being drawn between PSD and GAM to officialise this additional reuse activity. When all buildings & facilities at the PSD Head Quarters are completed, the estimated flow will increase and will reach design flow of 150 M³/day. At that point, PSD requirement for irrigation will not increase and it will still be 40 to 45 M³/day, then the available excess irrigation water which can be used by GAM will be 80 to 100 M³/day.

SWIM SWM's impact reaches beyond the pilot plant, having engendered small but considerable changes at the policy level. To this end, the project developed policy recommendations calling for a reference authority for Water Quality Control and relaxing the standards for reuse, especially regarding Nitrates. The Ministry of Water and Irrigation is at present drafting a DWWT-strategy, which can build on SWIM SWM's recommendations.

The water saving from the plant is significant and amounts to 150.000 JD/year. Currently training is in progress, out of the 13 trainees of the PSD, seven are police women.

The experience of Jordan shows the importance of the SCADA system and the need to do trouble shooting when the plant is first in operation.

The experience in Jordan shows that pilot sites are a good tool to illustrate the functioning and benefits of a certain technology. The SMART project has also illustrated this.

Also binding agreements are required with all stakeholders. GIZ invited all stakeholders at the beginning of the project and forged binding agreements.

Planned Activity	Achieved Output until 06/ 2015	Proof of output
Technical/Steering Committee meetings	<ul style="list-style-type: none"> • Technical Committee meeting May 2015 • Project activities 100% Completed • Take over meetings for PSD/NAW • Follow up meetings with PSD/GA 	<ul style="list-style-type: none"> • MoM • Take over Certificate • GAM/PSD signed agreement
Pilot activity: Treatment	<ul style="list-style-type: none"> • Flood management • Excess water management • Oder prevention tools • Water quality monitoring 	<ul style="list-style-type: none"> • Flood equipment • Intake equipment • Aerator • Lab reports
Pilot activity: Reuse	<ul style="list-style-type: none"> • GAM - PSD agreement • Demonstration garden • Reuse impact 	<ul style="list-style-type: none"> • Signed agreement • Monitoring documentation • Final assessment report
Evaluation and impact mission	<ul style="list-style-type: none"> • Complete evaluation and impact mission in Jordan 	<ul style="list-style-type: none"> • Draft final report in process

Planned Activity	Achieved Output until 06/ 2015	Proof of output
Capacity building for PSD staff	<ul style="list-style-type: none"> • O& M training by NAW on Feb • Active Jordanian participation at the 2nd E-learning course 	<ul style="list-style-type: none"> • Training summary report, list of trainees, training manual, evaluation sheet • 13 trainees: 7 policewomen, 6 policemen
Visibility activities	<ul style="list-style-type: none"> • Arab Water Week, Jan 2015 • Water Berlin, March 2015 • SEEM Conference (Sustainable Wastewater Management), April 2015 • USAID workshop, water and Climate change, April 2015 	<ul style="list-style-type: none"> • Power point presentation. • invitation letters. • Media coverage. • Proceeding

Best practices and lessons learnt

The following matrix illustrates the best practices and lessons learnt from SWIM Jordan:

EIA	Simplify procedures for small-scale WWTP
Water quality monitoring:	<ul style="list-style-type: none"> • Appoint a reference authority • Optimize parameters (list of parameters and frequency) • Support the role of decentralized entities • Relax reuse standards e.g. Nitrate
Private sector participation	<ul style="list-style-type: none"> • Enhance and strengthen private sector capacities (Design, Construction, O&M)
Guidelines & Regulations	<ul style="list-style-type: none"> • Small-scale treatment plants: Technology selection, Design, Pre-qualification, Tendering, O&M, Quality assurance, Licensing. • Adapted Jordanian Standards

Next Steps

1. Follow up on the O&M through the contractor
2. Follow up on the excess water management
3. Follow up on the water reuse and demo garden
4. Data management for better evaluations
5. Link project to ongoing and future initiatives (MWI, SMART, NICE, GIZ projects, and other projects)
6. Contribute to DWWT Jordanian strategy on O&M (Scheduled meeting with MWI & NICE Office in Germany)

Impact of Treated Wastewater Reuse at the Public Security Directorate (PSD)



1.1.2 Country update – Egypt

The following activities were conducted:

- ✓ Field visits
- ✓ Survey for data collection & evaluation
- ✓ Interviews with key-stakeholder in the pilot area
- ✓ Literature review for past initiatives
- ✓ TORs for Baseline Assessment Study

Additionally the following have been implemented:

- ✓ Tender Document
- ✓ EIA
- ✓ Call for offers

- ✓ Offers evaluation
- ✓ Contracting the executing firm (TIA Co.Germany/Target-Co.Egypt)
- ✓ Implementation: 15 June (4-6 months needed)

Preliminary Assessment of Past Initiatives

The pilot project in Egypt conducted an assessment of the challenges and success factors of past small-scale sanitation initiatives

The matrix below provides an overview of the findings:

Governorate	Village (District)	Technology
FIELD VISIT WITH SAMPLING		
Gharbeya	Mashal / Kom El-Naggar (Bassyun)	Activated sludge
Fayoum	Zawyat El-Karatsah WWTP	Compact anaerobic tower: upflow anaerobic sludge blanket + anaerobic filter + trickling filter + sand filtration
	Abdel Kareem Issa (Sanhorus)	Upflow Septic Tank / Baffled Reactor (USBR)
Beni Suef	Sheikh Yacoub (Fashn)	Primary settling tanks + aeration + subflow planted gravel filter + oxidation channel
	Maimun (Markaz El Wasta)	On-site collective septic tank with gravel filter + aerated filter at WWTP
Sharkiya	Kafr El Hamam (next to Zagazig)	Kimatech® (Prefabricated unit based on physico-chemical treatment)

CASE STUDIES WITH DATA AVAILABLE		
Dakahlia	Meet Dafr	UASB + Downflow Hanging Sponge (DHS)
	Samaha	Constructed wetland
	Meet Mazah	Waste stabilisation ponds
Gharbeya	Senbo	Dual Biological Aerobic Filter (DBAF)
Damietta	24 villages	Various technologies
Kafr El Sheikh	Various ezbas (incl. El Moufty, Om Sen, El Koleea)	Waste Stabilisation Ponds (WSP)
Giza	Zinin WWTP	Pilot compact anaerobic tower with biological filter
	NRC	Pilot UASB + DHS Pilot Primary sed. + DHS
FIELD VISIT ONLY		
Beheira	Sharaf El Din (Zawayt Gazal)	Anaerobic Baffled Reactor (ABR)
Qena (<i>visit to be done</i>)	Kom El Dabae	WSP, small-bore sewer sytem (SBS), forest
	Dandara	ABR with upflow gravel filter

More information about the finding can be found in:

1. Reymond, Ph., Abdel Wahaab, R., Moussa, M. (2015) Small-Scale Sanitation in Egypt - The ESRISS Project Final Report. Eawag, HCWW, Switzerland-Egypt (WWW.SANDEC.CH/ESRISS)
2. Reymond, Ph., Abdel Wahaab, R., Moussa, M. (2012).Small-scale Sanitation in Egypt – 10 Points to Move Forward. Research for Policy Brief. Eawag, Switzerland-Egypt (WWW.SANDEC.CH/ESRISS).

The following conclusions can be drawn for WWTPs in rural areas:

- Choose a simple and reliable process
- Ensure affordable O&M costs and low-skilled labour requirements
- Cluster decentralized treatment plants are an option to avoid high O&M costs and also render a project more financially viable for credit institutions.
- Use the least amount of land (in the densely populated agricultural areas)
- Low power consumption
- Minimum use of mechanical equipment
- Local availability of spare parts
- Any technology that works for larger populations can also be adapted to smaller populations
- Size of plant often determines which technology leads to lower capital costs
- Community often does not care much about the technology of the plant but of the location and the amount of land required (especially where land is a precious commodity, i.e. Nile Delta)
- Environmental effects such as odour, noise and vectors are a concern.

Discussion in plenary

The following points were raised in the plenary discussion following the presentation from Dr.Refaat. The technology selected for Egypt is the Prefabricated Compact Anaerobic and Aerobic Activated Sludge System (provided by TIA Co. Germany). It was pointed out that Jordan had already tried the Anaerobic fixed bed aeratedreactor based on the modified septic tanks technology. . The reasonsfor the selection of this technology are the low level of skills required for O&M and the overall positive experience of Jordan with the technology.

The sewer system in the pilot village was part of the original design; however the budget was allocated only for the treatment plant. The Holding Companyis currently looking for alternative ways to fund the sewer network. GIZ will contribute part of the costs and the local community is willing to provide voluntary labour. The EU has given the green light for the extension of the overall project until 30 March 2016.

In Egypt no clear operation manual is available for decentralized systems (large and small) to guide the operators.

1.1.3 Country update – Tunisia

The following matrix gives an overview of the planned and achieved activities until 06/2015.

Planned Activity	Achieved Output until 06/2015	Proof of output (minutes, etc.)
Conducted National/Technical Steering Committee meetings	<ul style="list-style-type: none"> No steering committee meetings were conducted in last period A final steering committee is planned for next July 2015, Many technical meeting are organized especially with ONAS IT department, 90 percent of the project is completed 	MOM
Conducted baseline assessments, EIA and etc.	<ul style="list-style-type: none"> The 3rd environmental analyses is prepared 1 environmental campaign was achieved to monitor the sand filter performance The second one will be conducted at the end of June. 	Analysis report
Construction work /opening ceremony/take over by partners	<ul style="list-style-type: none"> Construction of a sand filter completed in February 2015, The IT platform was tested in March 2015 Many small construction activities started in May 2015 	TOR, contract, Minutes of construction progress
Capacity building activities / conducted local trainings	<ul style="list-style-type: none"> Local training on the use of lab equipment procured for ONAS staff 	
Stakeholder workshops/National Steering/Technical committees meetings,	<ul style="list-style-type: none"> July 2015 Technical Committee Meeting was held in February, March and April 2015. 	
Impact and evaluation mission	<ul style="list-style-type: none"> Done since October 2014 	
Visibility activities (incl. presentations at international conferences), media coverage, PR material	<ul style="list-style-type: none"> Posters A guide for the maintenance of the sand filter was prepared 	

Best practices and lessons-learned according to these thematic clusters

Implementation	<ul style="list-style-type: none"> The involvement of ONAS in construction activities and monitoring
Stakeholder Engagement/awareness-raising	<ul style="list-style-type: none"> Training courses on IT platform management and laboratory analyses are conducted

Political support / Steering Committee engagement / coordination of sectors / policy-integration / publications	<ul style="list-style-type: none"> • SC is strongly supporting SWIM activities • A new guide for sand filter maintenance is under development
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The following points were raised in the plenary discussion following the presentation.

The guidelines on the O&M of tertiary sand filters were developed with ONAS regional department in cooperation with a private company.

The sandfilter is the tertiary treatment and has to be considered as a part of the WWTP. Its O&M therefore lies under the responsibility of ONAS. The sand-filter treatment covers all required water quality standards and hence no UV treatment is planned.

The project learnt that the Waste Water Association does not have the capacity to conduct the allocation of treated wastewater and so ONAS has taken over. The quality of the affluent of the plant is of good quality.

The Nitrate concentration in the outlet is very low because it is already quite low after the secondary treatment based on activated sludge.

The project plans to add drip irrigation in irrigated areas.

1.1.4 Country update – Morocco

The following matrix illustrates the implemented activities until June 2015 from SWIM Morocco. The Pilot Project is located in AitIdir, Valley de Dades, Morocco - Rural Integrated Water Resources Management Project with focus on ECOSAN & Rainwater Management.

Implemented Activity	Date	Proof of output (minutes, etc.)
Start of construction work	11.11.2014 End of June	Photos
End of construction Plantation of test garden	21.05.2015	Photos and agricultural products

The following points were raised in the plenary discussion:

Regarding rainwater harvesting: The current focus of the project is on flood protection. The Moroccan pilot site is on an altitude of 2000 m with a high risk of flood events in the winter month. Erosion prevention was initially planned, but finding the right surface was very difficult. Also, the paperwork required for the administrative procedures was very time consuming.

Regarding rainwater harvesting: Trees will be planted in 30 houses in order to improve soil quality. On top of that, permaculture will be practiced there. Rainwater and greywater irrigation is planned in 19 houses. Many houses separate greywater and black water and the greywater is used in the garden.

Regarding energy production: anaerobic digester with a flexible tank form PVC is used for the generation of energy through wastewater treatment. Cow manure and wastewater are used for the digester to produce bio-gas for household usage.

The cooperation with the construction company turned out to be slightly complicated due to amongst others language barriers. However, the company provided a translator and finally this obstacle could easily be overcome. The cooperation is going well and the construction company has been able to gain additional specialised expertise on ecological sanitation. The project has therefore enabled the construction company to establish itself in a new market of rural sanitation. This experience will feed into the new pilot project 'Employment in rural sanitation', which is being implemented by AGIRE in cooperation with CISAR.

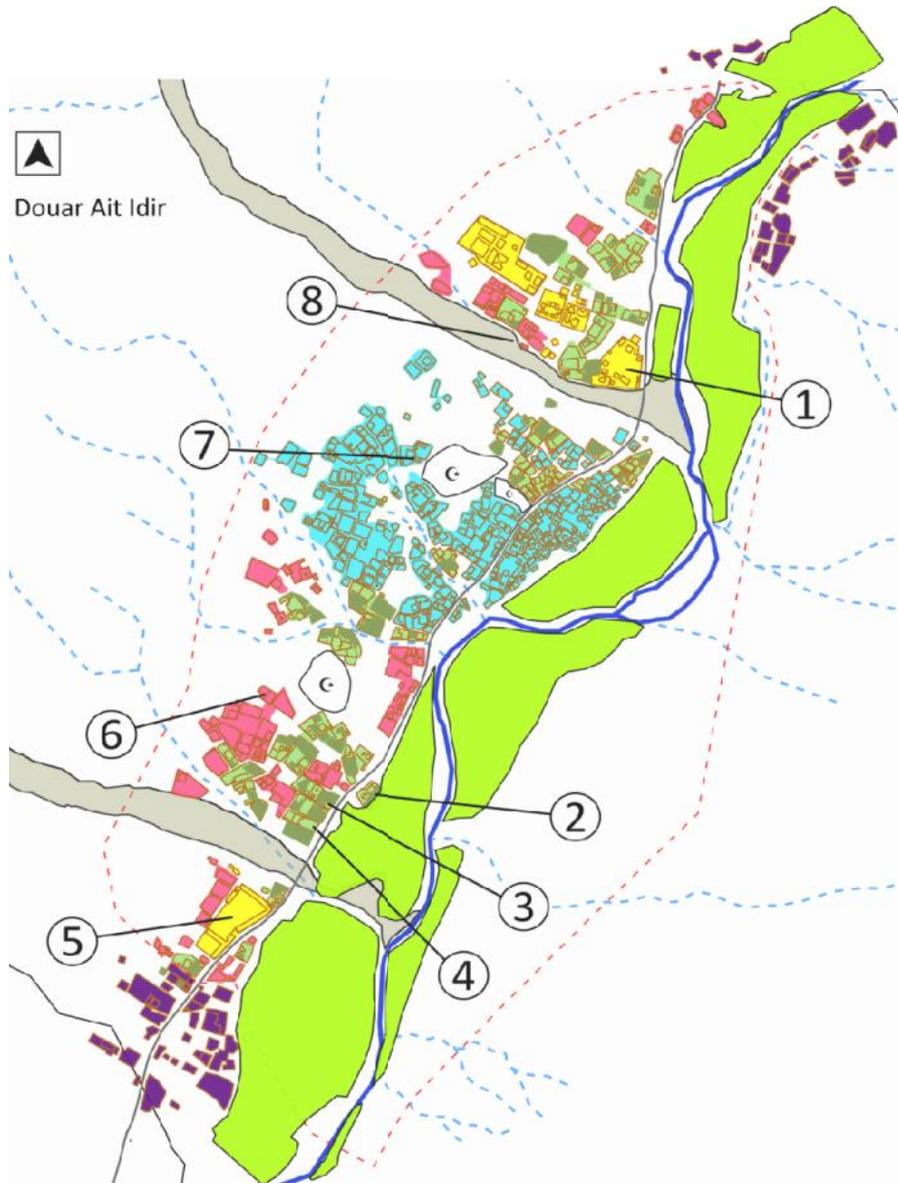
Despite having initially acquired the full support of the beneficiary community through thorough stakeholder engagement activities, the project was taken to court by a segment of the village population. The trial ended in favour of the project but it still suffered significant delays to its implementation and it was finally decided not to continue implementation in the said segments of the village. The problem can be traced back to local elections that took place shortly after the start of the project and the project was used as leverage against the incumbent mayor.

Despite this obstacle, the project was able to continue with a slightly modified ECOSAN plan for parts of the village. Through their active participation in the project implementation (i.e. survey participation, field trips to DeitIfrah etc.), the local population has been learning about and opening up to the benefits of ECOSAN technologies.

At a more policy level, a guideline for ECOSAN technologies is being developed for rural areas so that the applied technologies can also be used in other rural areas. These guidelines will feed into the larger National Rural Sanitation Plan, which is also being supported by AGIRE.

The inauguration of the plant is planned for September 2015, but the time schedule might be too tight for decision-makers and partners.

Overview of the site

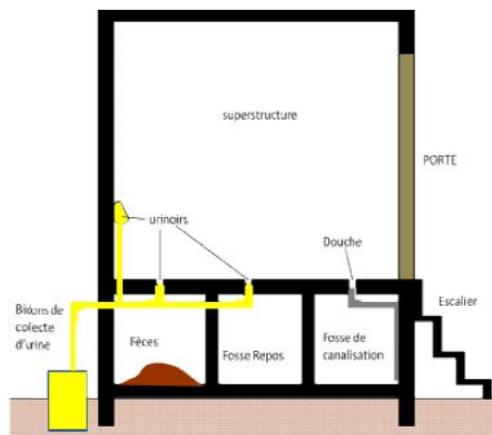
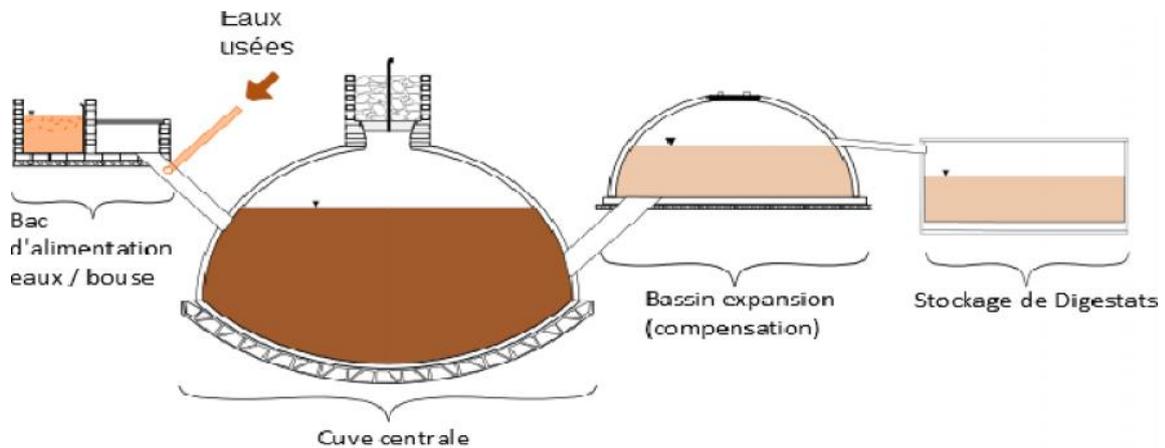
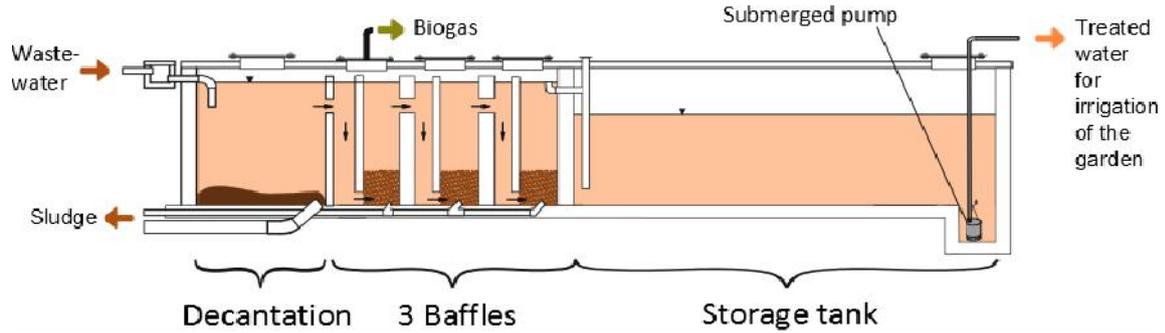


- 1) Primary School (UDDT)
- 2) Hostel (Digester)
- 3) Maison bénéficiaire W (Digester)
- 4) Maison bénéficiaire X (ABR)
- 5) Souk (UDDT)
- 6) Maison bénéficiaire Y (UDDT)
- 7) Maison bénéficiaire Z (Digester)
- 8) Ravin Nord (RWM, flood wall)

 The systems chosen are:

- Anaerobic trématent ABR
- Agricultural digesteurs for cattle farmers
- Urine Diverting Dehydrating Toilets (Public/Private)

Note: Centralized systems were not accepted as there was no land area available!



2. SWIM Evaluation

The lead evaluator, Ebba Augustin, presented the recommendations derived from the project evaluation of SWIM Sustain Water MED. The evaluation process stretched over a period of eight months. Initially, the PEV was expected to be concluded in December 2014. Due to the delay in the establishment of the pilot plant in Egypt, the evaluation mission was prolonged until June 2015. This

extension imposed a number of challenges on the evaluation team, Ebba Augustin and Thomas De Beyer, but enabled the inclusion of the Egyptian pilot project.

The mission assessed the SWIM project's overall performance and included the following site visits and meetings:

- Mission to Tunis October 2014
 - Meeting with COPIL + ANPE + Min Env.
 - Interview with GIZ Programme Manager
 - Skype with GDA + CDRA
- Mission to Morocco November 2014
 - Meeting with GIZ Team
Visit of DayetIfrah (Pilot of earlier project)
 - Meeting in QZZ: ABH SMD & Serv. Environment
 - Visit of AitIdir: Site visit + meeting with Municipality + meeting with contractors
- Mission to Jordan 16-18 Oct. and 10 Dec. 2014
 - Meeting with SWIM GIZ Team
 - Interviews with MWI and Min. of Environment
 - Meeting with National Steering Committee
 - Visit to Pilot Site at Public Security Directorate
- Mission to Egypt 14-16 April, 2015
 - Meeting with GIZ Team
 - Visit of Al Rayan village (Pilot village), meeting with village CDA
 - Meeting with administrative village head and affiliated company (Head of WW sector)
 - Meeting at Affiliated Company & National Research Center

Summary of the main findings:

The project's technical focus is of high relevance in all four partner countries. Most of the project's set objectives will be achieved until the end of the project, which includes the no-cost extension phase in September 2015. However, the efficient implementation was hindered by the political framework conditions that could not be foreseen in the period of the PEV. Additionally weaknesses were observed in the original project concept and in the stakeholder selection. The time allocation of three years is not sufficient for the achievement of full sustainability and the no-cost extension is an important factor in the successful and timely implementation of the project.

Recommendations for each pilot project are summarized and documented in the presentation attached to this report. Some lessons learnt can be drawn for the regional coordination of the project:

- Ensure the functioning of the pilot plants beyond the end of the project;
- Develop a plan for a transition phase including; the GIZ Water Programs and/or other donor initiatives as well as the SWIM Support programs;

- Include O&M and management concepts in the transition measures;
- Ensure the continued use of the SWIM instruments, application of lessons learnt and outputs such as the compendium and the IT Platform.

Additional points were raised in plenary:

Nabil Wakileh believes three years are sufficient for the implementation of a pilot project but these should be clearly delineated in phases and deliverables (milestones) per phase.

Tunisia faces considerable challenges with regards to O&M skills and finances.

3. Planning of remaining activities until September 2015

Ismail Al Baz gave an overview of the activities that were implemented since the last Regional SWIM meeting in Sharm El Sheikh on the 3rd and 4th of December, 2014:

- The SWIM SWM regional conference was held in December 2014 in Sharm el Sheikh and brought together 150 participants from 10 European and Mediterranean countries.
- The construction of the pilot plants Tunisia and Morocco were completed.
- The Jordanian pilot plant was officially handed over to the PSD in April 2015.
- The construction contract for the pilot plant in Egypt was signed in the second quarter of 2015.
- The Impact and Evaluation Mission in Egypt was completed.
- The Progress Report 2014 was submitted to the German Ministry of International Cooperation (BMZ) and the 3rd Amendment signed by all partners.
- SWIM Sustain MED was present in the Arab Water Week in Amman in January 2015. SWIM Sustain MED also attended SCM Barcelona in December 2014 and the Water Berlin, in March 2015.
- The second E-learning course on urban sanitation was implemented with 30 participants in January and February 2015.

The following activities are planned until September 2015:

- The final construction of the pilot plant in Egypt;
- The finalization of the Socio-Economic and Environmental Impact assessments;
- The elaboration of the compendium of best practices (editing, printing, translation);
- The final financial and audit reporting by December 2015;
- The final technical reports to the EU and BMZ by December 2015;
- The SWIM-SM Steering Committee and coordination meetings in November and December 2015;
- The 4th Amendment for EU/ BMZ will be signed to extend to project duration until March 2016;
- The 4th PA will be completed until December 2015;
- The dissemination of the compendium documentation; and finally
- The follow-up of project results and impacts.

4. Operationalizing lessons learnt

In the afternoon of the first day, a working group session provided space and time for the SWIM partners to draw lessons learnt from their work experience and to develop recommendations for any future DWWM initiatives.

Four working groups were formed on:

1. Steering/Communication
2. Beneficiaries/Target Group
3. Capacity Development
4. Implementation

The output of each working group is documented below.

1. Steering and Communication

Lessons learnt	Recommendations	To whom?
Steering & planning (regional) <ul style="list-style-type: none"> • 8 partners/ 4 Counterparts is challenging 	<ul style="list-style-type: none"> • Important to have continuous communication flow, a monthly web-chat with all consortium partners 	<ul style="list-style-type: none"> • Project Management
Steering & planning (national) <ul style="list-style-type: none"> • Need to involve all key stakeholders • Some administrative steps were under estimated in terms of time needed 	<ul style="list-style-type: none"> • Conduct more thorough stakeholder analysis at inception phase • Consider administrative delays • Conduct risk assessment at inception phase and evaluate throughout the project 	<ul style="list-style-type: none"> • National teams • Project Management
Communication: <ul style="list-style-type: none"> • Despite a lot of communication channels low flow of information • Weak understanding of roles (better towards the end of the project) 	<ul style="list-style-type: none"> • Have clear role descriptions and task divisions and communicate these regularly 	<ul style="list-style-type: none"> • Project Management
Website (impact) <ul style="list-style-type: none"> • Good for public relation and outside communication • Website not the best tool for internal communication (reliance on emails) 	<ul style="list-style-type: none"> • Ensure that necessary project information is circulated via email rather than a central platform such as a website 	<ul style="list-style-type: none"> • Project Management • National teams

The following points were raised in plenary:

In Jordan, the MWI chose the members of the Steering Committee in a top-down manner and not all relevant stakeholders were included.

The case of Morocco illustrates the importance to conduct a risk assessment prior to implementation, although not all difficulties could have been foreseen.

The website is a very useful tool, however some colleagues felt that it was not efficient for internal communication as information was also transferred via email.

Despite a good communication network, there was an inadequate flow of information between the European partners and the national teams. This can partially be traced back to the fact that the role of the European partners remained unclear for a long time. This improved as their role took on a more tangible form (site visits and evaluation meetings).

2. Beneficiaries/Target groups

Lessons learnt	Recommendations	To whom?
High participation	Adopt participatory approach	Beneficiaries
Scoping/stakeholders	Consider early involvement of potential stakeholders at different levels and including women	Beneficiaries
Willingness to contribute	Structure and design the activity so that it ensures tangible profits and guarantees a return in investment with minimal risk of failure	Beneficiaries
Sanitation and health	Adopt precautions for water reuse and sludge management to avoid contamination and disease	Beneficiaries
Trust level between all project management entities especially implementer and beneficiary	Develop clear project objectives and share precise framework and time-table. Also arrange frequent meetings and maintain adequate level of communication	Implementing agency (i.e. GIZ)
Maintenance is an important issue	Follow up on the maintenance plan and tools during and after project implementation	Implementing agency and beneficiaries
Communication is vital	Adopt communication tools that fit to the level of the beneficiary and surrounding environment to improve the awareness level in different dimensions with the focus on the replication and sustainability of the project	Implementing agency

3. Capacity Development

Lessons learnt	Recommendations	To whom?
Every case has a specific applicable technology	<ul style="list-style-type: none"> • Site visits • Evaluation of applicability in other areas 	GIZ, local authorities
Flexibility in: implementation, selection of technology, stakeholder involvement, capacity building	<ul style="list-style-type: none"> • Training courses • Use training outputs 	
Tools: e-learning saves time and effort, more efficient than traditional methods of training	<ul style="list-style-type: none"> • Use different multi-media tools 	GIZ, partners
Capacity development through work with more collaboration	<ul style="list-style-type: none"> • Internal monitoring 	GIZ, partners and Private Sector

with EU partners		
O&M after the handing over of the project: guidelines, O&M manual	<ul style="list-style-type: none"> • Develop troubleshooting manual • Continue revising the manual 	Owners (final beneficiary, company etc.)

The following point was raised in plenary:

- The guidelines produced by Adelphi and ENEA can be the basis for a manual for WWT projects.
- There is an urgent need in all countries for an O&M manual.

4. Implementation

Lessons learnt	Recommendations	To whom?
Tendering is <u>very</u> time consuming	Proper preparation is necessary, involve experienced partners (e.g. external experts)	GIZ, implementation partners
Limited numbers of local suppliers, contractors	<ul style="list-style-type: none"> • Check market early in the process • Consider joint ventures of national and international suppliers 	GIZ, implementation partners
Pilot projects are not interesting for suppliers, the budget is too small	Plan a higher budget during planning of the project, if possible	GIZ, implementing partners
Need time for detailed studies (social, technical, economic, market, environment) and baseline assessment	Plan for sufficient project time, have two phases or build on existing studies	GIZ, Implementing partners
Technology needs to be selected based on various criteria (some site specific)	Use existing or develop guidelines, evaluation matrixes for technology selection (based on e.g. cost, O&M, feasibility, land requirements)	Implementing partner, authorities, GIZ, donors
O&M is a challenge to budget and capacities	<ul style="list-style-type: none"> • Develop O&M manual for DWWT • Allocates sufficient budget • Train staff 	Implementing partner, authorities, GIZ, donors
Needs support from various ministries and local decision makers	Involve influential partners	Implementing partner, authorities, GIZ, donors

5. Compendium and assessment of effects

This session was managed by Adelphi and ENEA and focused on the final touches on the compendium and the assessment of effects.

Adelphi presented the current status of the compendium. The following issues were discussed with all project partners:

- Layout options for the Compendium: a vote was carried out on the pictures suggested for the cover of the compendium. Picture number 1 was the picture preferred by a majority of participants. Also, a suggestion was made to include more than one picture on the cover. adelphi will take into account the result of this vote when developing the final layout of the compendium cover with the graphic designer.
- Lessons learnt on challenges and good practices as well as policy recommendations: adelphi presented a first list of potential lessons learnt and recommendations and discussed these with the partners. Among the challenges to be mentioned in Chapter 4, the partners asked to mention the lack of resources and capacities for operation and maintenance of decentralised WWTP and the need to ensure long-term sustainability of such projects. Among the recommendations, it was added to the list that levels of regulation and requirements should be adapted to reflect different scales of these types of projects (i.e. regarding EIA, reuse standards, norms to be fulfilled). Also, participants stressed the need to prevent overlapping responsibilities and to define clear responsibilities and mandates (e.g. for monitoring, operation and maintenance) at the local level.

After the presentation of the compendium in plenary, a final discussion about the compendium's country chapters and assessment of effects was carried out with each country team following the *World Café* approach.

ENEA was in charge of following-up on technical aspects related to the assessment of effects, and in particular discussions were held with Moroccan, Tunisian and Jordanian teams. No specific follow-up was expected for Egypt due to the state of implementation of the pilot project as described in the first-day morning session.

The discussion with the Moroccan team was focused on the last design changes introduced in recent months in terms of planned technologies to be implemented in Ait Idir. Such changes were mainly due to political reasons, which enlightened once more the importance of gaining public consensus including all the most relevant stakeholders involved in the wastewater management sector. The modifications will not affect the overall effects from environmental point of view: indeed, the implementation of the whole pilot project will lead to a general improvement of the current situation. A complete and reliable O&M program was identified as the pivotal aspect to guarantee long-term benefits; in this regard, providing skills training for final users will be a crucial measure. This is especially important since the alternative to assign a responsible for the maintenance of all installed technologies does not feasible in the local context. Regarding the Compendium, ENEA suggests to provide some basic and relevant figures about the overall advantages gained by the decentralized and reuse approach (e.g. the amount of chemical fertilizers saved through the implementation of decentralized wastewater management in an elementary school of 200 pupils).

The discussion with the Tunisian team focused on the implementation of the tertiary treatment downstream the "STEP" in Medenine. The technology chosen is a classic slow sand filtration that includes 2 parallel on-site casting concrete units. The third monitoring report on water and soil quality will be sent to the SWIM partners in the first half of 2015. Quality data of the olive oil produced in the irrigated area will also be provided. As in the previous case, the O&M aspects will be crucial for the success of the pilot activity. In order to prevent the sand filter units from clogging, ENEA suggests to monitor the turbidity upstream of the sand filter. This way low-quality wastewater can be prevented from entering the filter and costly maintenance operations can be reduced. However, ONAS has not deemed it necessary to introduce this change - at least for now. In general, it is important to include

the sand filter unit as an integral part of the WWTP and as such under the responsibility of ONAS. The development of an O&M manual for the sand filter units is highly recommended. All these aspects will be crucial for the future evaluation of the sand filter technology as a tertiary-finishing treatment aimed at wastewater reuse.

The discussion with the Jordanian team was focused on the inlet storage tank, aimed at reducing odour emissions as well as reducing the risk of uncontrolled filling and leakages. A submerged aerator and a level controlled discharge pump have been installed into the storage tank, taking into account the progressively increasing flowrate (which increases as the number of PSD employees increases). Moreover, a sand filtration unit has been installed in order to provide adequate treatment of rainwater for reuse purposes. The monitoring of the treatment plant will be provided through a remote control with a specific alarm system allowing the operator to perform O&M in the shortest time possible thus reducing any possible negative impact.

adelphi discussed country specific recommendations as well as open questions for the case study chapters with each of the Pilot-country teams respectively.

With the Tunisian and the Moroccan team, not many questions on the contents of the compendium chapters needed to be discussed as both teams had the chance to review their chapters before the meeting. It was agreed with both teams that they would send the following remaining materials to adelphi: updated data on water quality obtained (if available), recent photos of the pilot sites, relevant graphs on the site and the technologies, existing factsheets and guides available on the technologies.

The discussion with the Egyptian team went into the details of the compendium chapter, regarding especially the Egyptian legal framework and a new code that will be introduced as well as the technology selected to be implemented on the pilot site. All information related to the new code and a factsheet describing the technology should be sent to adelphi, along with recent photos of the pilot site.

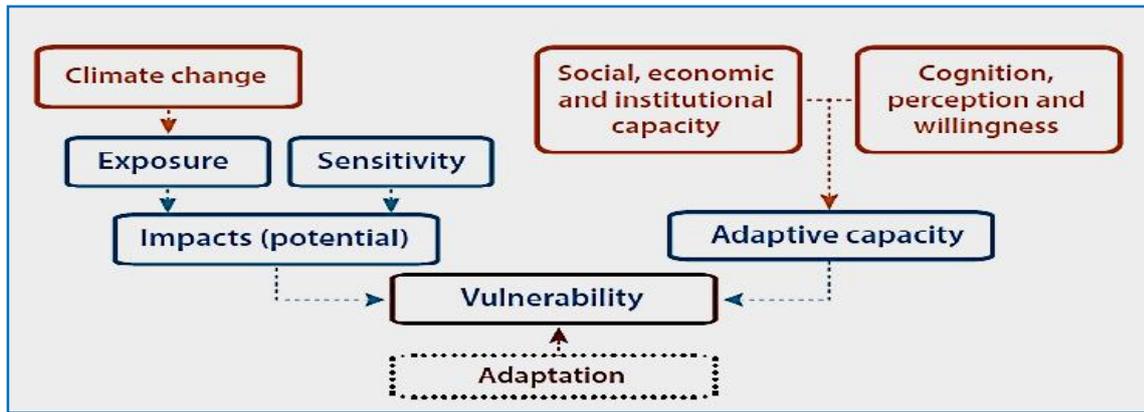
The discussions with the Jordanian team focused on the need for quality certifications for construction companies and technology providers of small-scale treatment plants. The team also mentioned the need to strengthen capacities of responsible staff (e.g. at WAJ) with regard to the preparation of ToR and evaluation of tenders for small-scale treatment plants. While these tasks are outsourced for large-scale treatment plants, in-house capacities are needed to ensure quality of tender procedures and implementation of small-scale projects.

6. Water and Climate Change

Dr. Rifaat and Dr Naser Almanaseer conducted the session on water and climate change. Dr. Naser Almanaseer presented ‘Decentralized Wastewater Treatment as an Adaptation Tool to Climate Change’. He highlighted that decentralized wastewater treatment represents one important measure to adapt the Jordanian water sector to the impacts of climate change as they enable groundwater recharge and for an alternative water source in dry seasons.

On very similar grounds, Dr. Refaat presented the benefits of sludge management and accompanying energy production on the impacts of climate change. The practice not only strengthens the resilience of the water and energy sector in Egypt but also acts as a mitigation measure to climate change.

He introduced the following Vulnerability Concept Framework:



Dr. Nasser introduced the methodological approach for the vulnerability analysis for Jordan.

Step 1: Assessment of baseline conditions	Qualify existing climatic and non-climatic conditions in the concerned sector/ area, including past experiences with extreme events, historical climate sensitivity, vulnerability thresholds, etc.
Step 2: Assessment of exposure	Assess frequency and magnitude of future climate change hazards using specific climatic indices
Step 3: Assessment of sensitivity	Assess the degree to which the the bio-physical and social components of the exposed sector/system may be affected by the climate change hazards
Step 4: Impact ranking	Evaluate the level of impact resulting from the combination of both exposure and sensitivity to climate change hazards
Step 5: Assessment of Adaptive capacity	Assess the ability of the system/community to withstand negative impacts and adjust to changing climatic conditions
Step 6: Overall vulnerability rating	Determine the level of climate change vulenrability as a function of both impact and adaptive capacity (Vulnerability ranking matrix)

He concluded with a presentation of the findings and conclusions of the assessment as well as an outline of proposed adaptation measures in the water sector.

Climate Change Hazards	Sensitivity Indicators Factors	Overall vulnerability assessment (Average for RPC 4.5 and RCP 8.5)	Adaptation measures	Priority level
Precipitation decreased	Groundwater level decline Groundwater quality deterioration Stream flow reduction	High	Rainwater harvesting	1
			Springs rehabilitation	2
			Increasing efficiency of irrigation	3
			Reduce abstraction	4
			Water saving devices	5
			Wastewater treatment	6
			Reduce irrigation	7
			Decentralized wastewater treatment	8
			Research programs	9
Temperature increased	Decline of groundwater recharge Stream flow reduction	Very High	Artificial recharge	1
			Conjunctive use	2
			Research programs	3
Drought	Increased water demand	High	Enhance water storage efficiency	1
			Plants with low water requirements	2
			Awareness programs	3
			Desalinization	4
			Develop tolerable prediction models	5
			Research programs	6
Evaporation	Stream flow reduction	High	Improve runoff - Catchment treatment	1
			Increasing efficiency of irrigation	2
			Enhance water storage efficiency	3
			Complimentary irrigation	4
			Grey water	5
			Desalinization	6
			Research programs	7

7. Peer to Peer, administration – next steps

In the final session of the meeting a peer to peer exchange was conducted based on the priority themes identified in the first session of day one. Two groups were formed on 'Sludge Management and Energy Production' and 'Climate Change and Water'. The peer to peer exchange is an open peer learning approach where participants freely engage in an unstructured exchange of expertise and lessons learnt around themes of their concern.

Next steps & deadlines

In the final session of the day, Ismail Al Baz summarized the main tasks and deliverables until the end of 2015.

It was already agreed in Sharm El Sheikh that the final audit reports have to be submitted by late of October in 2015. Hence, any costs related to activities and salaries have to be closed by the end of September. That implies that all activities of SWIM in the partner countries (with the exception of Egypt) have to be finalized by end of October. The extension requested by the EU until March 2016 is primarily to allow Egypt to finish the planned activity regarding the pilot plant.

All partners are requested by the end of October, to also send their progress reports with activities and technical details to the SWIM office. This will help the project to draft the final audit report and progress report to the EU by the end of 2015. GIZ is planning a final audit report for SWIM in November 2015. Financial reports need to be submitted by end of October 2015 at latest. This request refers to all colleagues who receive funds directly from GIZ.

Regarding the pilot plants, it is expected that all activities regarding the plants will be finished by end of September. Handover ceremonies will be planned in each of the partner countries. The SWIM office needs to be informed as early as possible regarding the planned events. This is important for the coordination of the events across the four partner countries and for the invitation to the EU delegation in the respective country.

The GIZ colleagues in Tunisia and Morocco are requested to file their time-sheets for GIZ and EU reports. Hesham Asalamat will remind all colleagues in the coming days on the missing months. The SWIM team is expecting to receive the updates as soon as possible.

Please send updates of the action plans also as soon as possible. The updates to the current plans (in the existing excel sheets) need to arrive at the SWIM office latest by the 15th of June.

The EU and GIZ format (takeover document) have to be used for the handover to the partners. All items that are handed over have to be listed. The handover reports are part of the upcoming audit and have to be compiled by SWIM as per GIZ and EU requirements.

8. Thank you note and close

The meeting closed with a thank you note from Dr. Ismail Al Baz. He especially thanked the team of ENEA, Roberto Farina, Luigi Petta and Marco Ferraris for their organization of the SWIM meeting in Bologna!

Annexes

1. **Presentation Socio-economic and environmental impact assessment Adelphi/ENEA**
([Click Here](#))
2. **Presentation of final evaluation mission**
([Click Here](#)) for PDF format, ([Click Here](#)) Power point format
3. **List of participants**
4. **Agenda**
5. **Regional Action Plan**
([Click Here](#))

Annex 3

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SWIM- Sustain Water MED: Network of Demonstration Activities for Sustainable Integrated Wastewater Treatment and Reuse in the Mediterranean

6th SWIM Regional Meeting December 07-11, June 2015 Bologna, Italy
Hotel in Bologna to be announced later

Annex 4 Agenda

Day 1 - 08th of June, 2015

<i>Time</i>	<i>Activity</i>	<i>Responsibility of</i>
08:30 – 10:00	<p>Welcome and Introduction:</p> <ul style="list-style-type: none"> ➤ Introduction of participants ➤ Agenda review ➤ Collection of ideas for country to country exchange (peer to peer) day 2 <p>Update on project progress: (Where are we now)</p> <ul style="list-style-type: none"> ➤ Report back on activities from 01/2015 – 06/2015 and planned until Sept 2015 (15 min each country) ➤ Planned- achieved (Log-frame/Regional action plan) 4 plans (plan & indicator) ➤ Opportunities/challenges –open questions ➤ Lessons learnt ➤ Project sustainability (per country) 	<p>Ismail Al Baz</p> <p>Ebba Augustin (Moderator)</p> <p>Moderator</p> <p>SWIM Team all countries and other partner countries</p>
10:00 – 10:30	Coffee Break	
10:30-12:00	<p>SWIM Evaluation</p> <ul style="list-style-type: none"> ➤ Presentation of final Evaluation results ➤ Presentation of results of social and impact evaluation missions ➤ Plenary discussion 	<p>Moderator Ebba Augustin Adelphi and ENEA</p>
12:00-13:00	Lunch break	
13:00-15:30	<p>Topic 1: Planning of remaining project activities until September 2015</p> <ul style="list-style-type: none"> ➤ Presentation: Ismail Al Baz <p>Topic 2: Operationalizing lessons learnt Working groups to design the optimal SWIM project (based on lessons learnt)</p> <ul style="list-style-type: none"> ➤ Presentations of working groups ➤ Feedback from plenary 	<p>Ismail Al Baz</p> <p>Moderator</p>
15:30-16:00	Coffee break end of 1st day session	



Day 2 - 9th of June, 2015

<i>Time</i>	<i>Activity</i>	<i>Responsibilities of</i>
9.00 – 10.00	Presentation of WG results and plenary discussion	
10.00 – 10.45	Compendium and assessment of effects (adelphi, ENEA): <ul style="list-style-type: none"> ➤ Presentation of the compendium and policy papers by (adelphi): short presentation of current progress and Discussion in plenary. 	Adelphi & ENEA Moderator
10:45 – 11.15	Coffee break	
11.15- 12:30	Water and Climate Change <ul style="list-style-type: none"> ➤ Presentation on Nexus Energy, food & Water and Climate Change (Dr. Refaat) ➤ Discussion in plenary ➤ Presentation of results of the WG and discussion in plenary 	Moderator
12:30 – 14:00	Lunch break	
14:00-15:30	Peer to Peer <ul style="list-style-type: none"> ➤ In small working groups ➤ Feedback in plenary ➤ Wrap up and close ➤ Admin and what next 	Moderator Ismail Al Baz
19:00	Get together event (to be announced)	

Day 3 - 10th of June, 2015

<i>Time</i>	<i>Activity</i>	<i>Responsibilities of</i>
09:00 – 18:00	<ul style="list-style-type: none"> ➤ Technical Excursion visit of EXPO 2015 in Milan 	Roberto Farina

Annex 5Regional Action Plan ([Click Here](#))