



Expert Facility Activity No: EFS-PS1

MAINSTREAMING DROUGHT RISK MANAGEMENT

Training Report: Cost of Environmental Degradation

September 2018

| Version | Document Title | Author | Review and Clearance |
|---------|--|-----------|----------------------|
| V1 | Training Report: Cost of Environmental Degradation | Gert Soer | Suzan TAHA |



THE SWIM AND H2020 SUPPORT MECHANISM PROJECT (2016-2019)

The SWIM-H2020 SM is a Regional Technical Support Program that includes the following Partner Countries (PCs): Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, [Syria] and Tunisia. However, to ensure the coherence and effectiveness of Union financing or to foster regional co-operation, eligibility of specific actions will be extended to the Western Balkan countries (Albania, Bosnia Herzegovina and Montenegro), Turkey and Mauritania. The Program is funded by the European Neighbourhood Instrument (ENI) South/Environment. It ensures the continuation of EU's regional support to ENP South countries in the fields of water management, marine pollution prevention and adds value to other important EU-funded regional programs in related fields, in particular the SwitchMed Initiative, and the Clima-South project, as well as to projects under the EU bilateral programming, where environment and water are identified as priority sectors for the EU co-operation. It complements and provides operational partnerships and links with the projects labelled by the Union for the Mediterranean, project preparation facilities in particular MeSHIP phase II and with the present phase of the ENPI-SEIS project on shared environmental information systems, whereas its work plan will be coherent with, and supportive of, the Barcelona Convention and its Mediterranean Action Plan.

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



Acknowledgements:

Special thanks need to be directed to the Palestinian Water Authority (PWA), in particular to Ms. Majeda Alawneh, Manager Water Quality Department, and Eng. Omar Zayed; Director of Studies & Hydrological Monitoring Department

Disclaimer:

This publication was produced with the financial support of the European Union. Its contents are the sole responsibility of the SWIM-H2020 SM Project and do not necessarily reflect the views of the European Union.



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ABBREVIATIONS

| | |
|-----------|---|
| COED | Cost of Environmental Degradation |
| EF | Expert Facility |
| ENI | European Neighbourhood Instrument |
| ENP | European Neighbourhood Policy |
| MeSHIP | Mediterranean Hot Spot Investment Program |
| MoA | Ministry of Agriculture |
| MoH | Ministry of Health |
| PC | Partner Country |
| PHG | Palestinian Hydrology Group (NGO) |
| PWA | Palestinian Water Authority |
| SEIS | Shared Environmental Information Systems |
| SWIM-SM | Sustainable Water Integrated Management (project) – Support Mechanism |
| SwitchMed | Initiative that supports and connects stakeholders to scale-up social and eco innovations in the Mediterranean. |
| WBWD | West Bank Water Department |
| WP | Work Package |



1 GENERAL INTRODUCTION

Within the scope of the Expert Facility (EF) work package (WP1), the EU-funded “Sustainable Water Integrated Management & Horizon 2020 - Support Mechanism (SWIM-H2020 SM)”, in cooperation with the Palestinian Water Authority (PWA), conducted a 2-day workshop on Cost of Environmental Degradation (COED) in Palestine.

The workshop was requested by PWA with the aim to make its staff more familiar with the COED concept and be informed about the prospects to apply this concept in the Palestinian Water Sector.

The workshop **took place on 11 and 12 July 2018** in the Carmel hotel in Ramallah. On the first day presentations were made on ‘Introduction to the concept of Cost of Environmental Degradation’, ‘Air Pollution: The case of Jordan’, ‘Water Degradation: The case of Tunisia’, and ‘Water Degradation: The case of Jordan’. Each presentation was followed by a longer discussion and possibility to ask questions. On the second day, presentations were made on ‘Land degradation: The case of Morocco’ and ‘Policy consequences’. The presentations and subject discussions were followed by a longer general discussion on the methodology and the options for Palestine.

The workshop programme is presented in Annex 1, Workshop Programme

2 OBJECTIVES OF THE ACTIVITY

The general objective of the workshop was to make PWA staff and staff of other Ministries such as the Ministry of Agriculture (MoA) and Ministry of Health (MoH) more familiar with the concept and methods of the calculation of the cost of environmental degradation (COED) and the assessment of the economic impacts (including impacts of climate change on the environmental status, primarily focusing on the water and agricultural sectors) and discuss with them the prospects of applying the methodology in Palestine.

3 EXPECTED RESULTS OF THE ACTIVITY

The expected results of the action are:

- The participants’ understanding of the concept of COED has been enhanced
- The participants’ understanding of how the COED can be calculated for different topics (water, air, soil, industrial pollution) is improved
- The participants have a basic idea for what the method can be used and its limitation under conditions of limited data availability
- The participants better understand the relation between pollution, environmental degradation and related cost.



- The way forward in carrying out COED studies for Palestine is deliberated with the participants and identified

The participants are not expected to be able to implement the methodology without further external guidance.

4 PROFILE OF THE PARTICIPANTS

The training was conducted mainly for PWA staff for engineers and people with a similar level of education. A handful of this staff has management functions on the level of Director or Head of Department, the others occupy technical functions. Fourteen of the in total 20 participants were PWA staff.

The other six participants came from the West Bank Water Department (1), Ministry of Agriculture (MoA) (2), Ministry of Health (MoH) (2) and the Palestinian Hydrology Group (PHG) (1). Two of these six are directors/heads of department.

Women were under-presented; only six of the 20 participants (30 percent) were women. They were however equally active in the discussions.

More information on the participants can be found in Annex 2, List of Participants.

5 EVALUATION OF THE EVENT

Two categories of indicators were used to evaluate the workshop: **i) evaluation indicators**, reflecting the quality of the workshop logistics/ organisational aspects (See section A below) and the assessment of the technical quality of the workshop (See section B below), as perceived by the participants, **ii) impact indicators**, reflecting the direct impact of the workshop (See Section 6 below). The indicators and associated ratings are presented in Tables 1, and 2 respectively. Table 3 provides the specific remarks made by the non-key expert on the workshop (Section C below). Twelve out of twenty participants (60 percent) filled in the evaluation form

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

A set of 7 criteria; A1-A7 (See Table 1 below) was 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 assigned numbers as follows: Excellent = 4; Good = 3; Average = 2; Poor = 1



Table 1 : Results of the evaluation of the organization, administrative and planning issues

| A. ORGANISATIONAL, ADMINISTRATIVE AND PLANNING ISSUES BEFORE AND DURING THE EVENT (12 forms were filled) | | Number of Replies | | | | | Average Score (max = 4) |
|--|--|-------------------|------|---------|------|---------------|-------------------------|
| | | EXCELLENT | GOOD | AVERAGE | POOR | Total Replies | |
| A1 | Efficient logistics: location of venue and interpretation | 3 | 5 | 4 | 0 | 8 | 2.92 |
| A2 | Smooth flow of programme, efficient handling of emerging needs and attentiveness to participants concerns | 2 | 4 | 5 | 1 | 6 | 2.58 |
| A3 | Presentations correspond and contribute to the planned objectives and are conducive to enhanced shared understanding and participation on addressed topics | 3 | 2 | 4 | 3 | 8 | 2.42 |
| A4 | Clarity, coverage and sufficiency of concepts, objectives, anticipated outputs and outcomes | 1 | 2 | 6 | 3 | 8 | 2.08 |
| A5 | The materials distributed were helpful | 1 | 6 | 4 | 1 | 9 | 2.58 |
| A6 | Efficient and Effective Facilitation | 0 | 7 | 4 | 1 | 9 | 2.50 |
| A7 | Overall rating of the event | 0 | 7 | 4 | 1 | 9 | 2.50 |

The overall rating of 2.51 out of four indicates that the event was reasonably well appreciated. The figures also indicate that expectations were not fully answered. Side discussions with the participants during coffee breaks and lunch time revealed that quite a few participants expected that they would have learned in the seminar how to calculate the cost of environmental degradation. In the opinion of the trainer this can only be achieved in a learning-by-doing approach. In a two-day seminar, the complex issue of cost of environmental degradation can only be introduced to participants that have no extensive knowledge of the concept; more cannot be expected.

B. Feedback on Technical Aspects

Table 3 below presents the feedback received from the participants on the technical aspects of the event

Table 2 : Results of the evaluation of the technical aspects of the training

| B. FEEDBACK ON TECHNICAL ASPECTS | | No. of replies |
|----------------------------------|--|----------------|
| B1 | Coverage of the event; In your opinion did the event cover (tick one of the following): | |
| | <i>All the topics necessary for a good comprehension of the subject nothing more</i> | 0 |
| | <i>Some topics covered are not necessary</i> | 1 |
| | <i>Some additional topics should be included</i> | 11 |
| | <i>No reply</i> | |



| B. FEEDBACK ON TECHNICAL ASPECTS | | No. of replies |
|----------------------------------|--|----------------|
| | Total Replies | 12 |
| B2 | Level of difficulty | |
| | <i>Difficult</i> | 1 |
| | <i>Adequate</i> | 5 |
| | <i>Elementary</i> | 6 |
| | <i>No reply</i> | |
| | Total Replies | 12 |
| B3 | Length of the training; In your view the workshop duration (tick one of the following): | |
| | <i>Longer than needed</i> | 2 |
| | <i>Sufficient</i> | 4 |
| | <i>Shorter than required</i> | 6 |
| | <i>No reply</i> | |
| | Total Replies | 12 |
| B4 | What is the most valuable thing you learned during the workshop (knowledge or skills)? | |
| | <i>The concept of environmental degradation</i> | 7 |
| | <i>To estimate the cost of environmental degradation</i> | 6 |
| | <i>The impacts of environmental degradation</i> | 3 |
| | <i>A local module should be developed to assess the cost of environmental degradation</i> | 1 |
| | <i>Mitigation measures lower the cost and the burden on the government</i> | 1 |
| | Total Replies | 18 |
| B5 | How do you think that the current event will assist you in your future work on the subject? | |
| | <i>It will help increase awareness of the of the importance of preserving our resources</i> | 1 |
| | <i>Not much (we need more specific information on specific water degradation)</i> | 1 |
| | <i>Ability to calculate the cost of ground- and surface water degradation enhanced</i> | 2 |
| | <i>How to calculate cost of environmental degradation</i> | 1 |
| | <i>The cost of environmental degradation should be addressed in all financial planning</i> | 1 |
| | <i>How to calculate the negative environmental impacts of waste water reuse</i> | 1 |
| | <i>How much the cost of environmental degradation affects the development of the country</i> | 1 |
| | <i>It is good</i> | 1 |
| | <i>It is the start of thinking about the different issues causing environmental degradation</i> | 1 |
| | Total Replies | 10 |
| B6 | Please indicate whether (and how) you could transfer part of the experience gained from the event to your colleagues in your country? | |
| | <i>By knowledge exchange</i> | 3 |
| | <i>By workshops and meetings</i> | 1 |
| | <i>Share presentation and references</i> | 1 |
| | <i>I need to read more first and understand better</i> | 1 |
| | <i>To start a case study with colleagues and work with them hand in hand to produce results</i> | 2 |



| B. FEEDBACK ON TECHNICAL ASPECTS | | No. of replies |
|----------------------------------|--|----------------|
| | Total Replies | 8 |
| B7 | What did you like most about this event? | |
| | <i>Rich and interesting material</i> | 2 |
| | <i>The case study presentations</i> | 2 |
| | <i>Cost calculation of water degradation and health</i> | 1 |
| | <i>Good and new topic and worth to study and read about it</i> | 2 |
| | <i>Everything</i> | 1 |
| | <i>The subject itself</i> | 1 |
| | <i>Discussions that took place during the lectures</i> | 1 |
| | Total Replies | 10 |
| B8 | What needs to be improved? | |
| | <i>More explanation and knowledge about how to calculate the cost of environmental degradation</i> | 4 |
| | <i>Application to a practical case in Palestine</i> | 2 |
| | <i>More focus on the calculation of the cost of environmental degradation</i> | 3 |
| | <i>Studies and examples to be new not old</i> | 1 |
| | Total Replies | 10 |

C. Remarks by the trainer

A set of nine criteria; B1-B9 (See table below) are used hereby by the trainer to provide an overall assessment of the event.

TABLE 3 : ASSESSMENT BY THE TRAINER

| | |
|----|--|
| B1 | Efficient and effective performance and interaction by participants: the event was highly interactive with very active discussions on all the topics that were addressed. |
| B2 | Efficient and effective cooperation and team spirit; COED was an almost completely new concept for the participants. The participants were very interested and showed great spirit and all but one stayed until the very end of the seminar; discussions were open and respectful and showed good cooperation between different PWA departments and with the other involved ministries. |
| B3 | Level of achievement of planned objectives: All the information and examples presented were received with interest. Some participants had hoped to be able to apply the methodology after the seminar, but the methodology is too complex; in two days only an introduction could be made. |
| B4 | Did the event contribute to helping participants practice skills or gain knowledge related to course concepts: participants gained knowledge related to the COED concept. |
| B5 | What worked well during the event; discussions within the group, and with the trainer, |
| B6 | What didn't work well and why: filling in the quizzes and evaluation forms. Only half of the participants responded despite promises made. |
| B7 | What components/concepts did participants seem to understand well: the concept of COED; the way of calculating costs (only the general concepts). COED being an instrument in financial planning. |
| B8 | Were there any components/concepts that participants appeared to not understand: the responses in the questionnaires put some doubts on whether the cause-effect chain of environmental degradation was always well understood. |



| | |
|----|---|
| B9 | What aspects of the event could be improved and what to be kept: Three of the ten participants who filled the evaluation form would have liked the inclusion of practical work. The trainer judges that for that formal training is not adequate and hands-on training should be envisaged in small working groups. What worked well was the discussion between different participants. This could be the major highlight of the training. |
|----|---|

6 ANALYSIS OF THE RESULTS OF THE TRAINING COURSE

The training succeeded to mobilise a significant number of staff of PWA and some other government entities. Almost all participants stayed until the end and showed unremitting interest. A summary overview of the participants is given in Table 4.

TABLE 4 : WORKSHOP PARTICIPATION/ DEMOGRAPHICS

| | |
|--|------|
| Total No. of participants actually attending one or more training days | 20 |
| Total No. of participants Planned to attend | 15 |
| Planned/Actual | 140% |
| Number of organisations/agencies/authorities that were represented | 5 |
| Gender balance (% of women participants) | 30% |
| NGO representation: No. of participants from NGOs | 1 |

A pre-training assessment was not conducted. However, after the training a questionnaire was distributed to test how much the participants have understood the concept of COED and related issues (such as cause-effect relations). The results of this questionnaire are summarised in Table 5.

TABLE 5 : EVALUATION OF THE RESULTS OF THE KNOWLEDGE ACQUIREMENT TEST:

| Question | Changes in awareness, knowledge and skills | % |
|----------|--|-----|
| Q1 | % of participants that were aware which organisation invented initiated the concept of COED | 70 |
| Q2 | % of participants that correctly answered the question which subjects were presented during the training | 70 |
| Q3 | % of participants that understood which the concepts of cost calculation are | 70 |
| Q4 | % of participants that could correctly classify the COED approach | 60 |
| Q5 | % of participants heard about the concept of COED before the training | 100 |
| Q6 | % of participants that had a good general understanding of the COED methodology | 30 |
| Q7 | % of participants that correctly understood the methodology to calculate the cost of air pollution | 20 |
| Q8 | % of participants that correctly understood what measures need to be taken to reduce air pollution | 60 |
| Q9 | % of participants that correctly understood the methodology to calculate the cost of water pollution | 40 |
| Q10 | % of participants that correctly understood what measures need to be taken to reduce water pollution | 70 |



| Question | Changes in awareness, knowledge and skills | % |
|----------|---|----|
| Q11 | % of participants that correctly understood the methodology to calculate the cost of land degradation | 80 |
| Q12 | % of participants that correctly understood what measures need to be taken to reduce land degradation | 60 |

This questionnaire was filled in by ten out of 20 participants (50 percent).

- Answers on questions Q1 and Q2 indicate that not all participants were following the presentations well and/or had language problems.
- Answers on Q3 and Q4 indicate that two-third of the participants judged they understood the concept of COED. However, the poor score on Q6 and also on Q7 and Q9 puts some doubt on this.
- About two-third of the participants had a good general understanding of cause-effect relations between drivers and degradation

7 CONCLUSIONS & OVERALL ASSEMENT

Below is an overall evaluation of the training workshop. It can be concluded that the expected outcomes of the workshop - **as planned in the design phase** - have been largely achieved. Table 6 below, describes how the planned outcomes were achieved.

TABLE 6 : LEVEL OF ACHIEVEMENT OF TRAINING OBJECTIVES AND OUTCOMES:

| Planned outcomes as defined prior to the workshop | Have they been achieved? |
|---|--|
| <ul style="list-style-type: none"> • The participants' understanding of the concept of COED has been enhanced | Yes, through interactive presentations, discussions, and Q&A. However, the answers to the questionnaire indicate that this was not the case for all participants. |
| <ul style="list-style-type: none"> • The participants' understanding of how the COED can be calculated for different topics (water, air, soil, industrial pollution) is improved | Yes, the end-of-training questionnaires show that at least 70 percent of participants have a good understanding how cost can be calculated. As the calculation methodology was new for almost all of the participants, this is an almost 70 percent increase in their understanding. |
| <ul style="list-style-type: none"> • The participants have a basic idea for what the method can be used and its limitation under conditions of limited data availability | Correct. However, the answers to the questionnaire indicate that this was not the case for all participants. |
| <ul style="list-style-type: none"> • The participants better understand the relation between pollution, environmental degradation and related cost | Yes (by dedicated presentations). It holds for a considerable majority of participants |



| Planned outcomes as defined prior to the workshop | Have they been achieved? |
|--|---|
| <ul style="list-style-type: none">The way forward in carrying out COED studies for Palestine is deliberated with the participants and identified | The issue came up in the final discussion on the second day and in corridor discussions with a handful of participants. There is substantial interest with the middle management of PWA, MoA and MoH to apply the methodology for water resources deterioration in a hands-on study exercise with external support. |

A few final remarks:

- Most participants command the English language well. It can however not be excluded that some participants had problems in following the presentations. In the answers to the questionnaires, there is some indication (but no decisive proof) that this might have been the case.
- The answers to the knowledge questionnaire indicate that the understanding of cause-effect relations within environmental degradation themes - such as air pollution, water pollution and land degradation - might not be adequate for around one third of the participants. Without fully understanding these relations, it is not possible to understand the COED cost calculation concept and methodology. Language issues may have somewhat deflated the percentages mentioned in Table 5.
- Expectations – as expressed by PWA middle management before the workshop - regarding a more practical approach of the training workshop, could not be answered, due to the relatively short time and the need to adequately explain the complex concept and methodology of COED, as well as due to the rather large difference in the level of understanding of the concept of environmental degradation itself among the participants (as also shown by the different answers to the questionnaires).
- Following on that – during side-discussions - the wish was expressed by some participants that a comprehensive study is carried out in near future on the cost of water quantity & quality degradation. The SWIM/H2020-SM is advised to put this issue on the agenda of consultations with the PWA. If such support is decided, it should take place in a learning-by-doing environment with a small group of Palestinian experts and adequate external support.



8 ANNEXES

ANNEX 1 - AGENDA

COST OF ENVIRONMENTAL DEGRADATION WORKSHOP PROGRAMME

First day (11 July 2018)

| time | subject | remarks |
|-------|--|--|
| 10:00 | Opening of the workshop and presentation of participants | |
| 10:10 | Expectations | Presentation of participants Collection of expectations which serves as a basis for workshop evaluation |
| 10:30 | Introduction to the concept of Cost of Environmental Degradation | Presentation of 20 minutes followed by questions and discussion |
| 11:15 | Air Pollution: The case of Jordan | Presentation of 20 minutes followed by questions and discussion |
| 12:00 | coffee break | |
| 12:30 | Water Degradation: The case of Tunisia | Presentation of 20 minutes followed by questions and discussion |
| 13:15 | Water Degradation: The case of Jordan | Presentation of 20 minutes followed by questions and discussion |
| 14:00 | Lunch | |

Second day (12 July 2018)

| time | subject | remarks |
|-------|--|---|
| 09:00 | Feedback on the first day | |
| 09:15 | Land degradation: The case of Morocco | Presentation of 20 minutes followed by questions and discussion |
| 10:00 | Policy consequences | Presentation of 15 minutes followed by a longer guided discussion |
| 10:45 | Coffee break | |
| 11:30 | Options for the implementation of COED in Palestine | Verbal presentation and guided discussion |
| 12:00 | General discussion and questions | Questions and answers; general remarks and discussion |
| 12:50 | Closure of the workshop; workshop evaluation by participants | Distribution of seminar materials and questionnaires |
| 13:00 | Lunch | |



ANNEX 2 - LIST OF PARTICIPANTS

| COUNTRY | TYPE OF INSTITUTION (please use the options provided*) | TITLE (Mr/Ms) | FIRST NAME | LAST NAME | POSITION/ FUNCTION | ORGANISATION/ INSTITUTION |
|-----------|---|---------------|------------|-------------|--|---------------------------|
| Palestine | GOVERNMENT AGENCIES | Mr | Anwar | Zuhluf | | Palestine Water Authority |
| Palestine | GOVERNMENT AGENCIES | Mr | Hazem | Hamed | | Palestine Water Authority |
| Palestine | GOVERNMENT AGENCIES | Mr | Hamadi | Bader | | Palestine Water Authority |
| Palestine | GOVERNMENT AGENCIES | Ms | Majeda | Alawneh | Head Water Quality Dept. | Palestine Water Authority |
| Palestine | GOVERNMENT AGENCIES | Ms | Salam | Abu Hantash | Head of Section Water Harvesting | Palestine Water Authority |
| Palestine | GOVERNMENT AGENCIES | Mr | Omar | Zayed | Director of Studies & Hydrological Monitoring Department | Palestine Water Authority |
| Palestine | GOVERNMENT AGENCIES | Ms | Rasha | Salfiti | Laboratory technician | Palestine Water Authority |
| Palestine | GOVERNMENT AGENCIES | Mr | Fuhaid | Siyam | Laboratory technician | Palestine Water Authority |
| Palestine | GOVERNMENT AGENCIES | Ms | Rawan | Saleem | Laboratory technician | Palestine Water Authority |
| Palestine | GOVERNMENT AGENCIES | Mr | Imad | Saifi | Director Regional Directorate | Palestine Water Authority |
| Palestine | GOVERNMENT AGENCIES | Mr | Marwan | Budair | - | Palestine Water Authority |



| | | | | | | |
|-----------|--------------------------|----|-------------|------------|---|---------------------------|
| Palestine | GOVERNMENT AGENCIES | Mr | Azhar | Shareef | Laboratory technician | Palestine Water Authority |
| Palestine | GOVERNMENT AGENCIES | Mr | Ali | Ramadan | Engineer | Palestine Water Authority |
| Palestine | GOVERNMENT AGENCIES | Mr | Kamal | Issa | Director Water Tarif Dept. | Palestine Water Authority |
| Palestine | GOVERNMENT AGENCIES | Mr | Muhamed | Hdaidom | - | West Bank Water Dept. |
| Palestine | MINISTRY REPRESENTATIVES | Mr | Azzam | Shabib | - | Ministry of Health |
| Palestine | MINISTRY REPRESENTATIVES | Mr | Mahmoud | Othman | - | Ministry of Health |
| Palestine | MINISTRY REPRESENTATIVES | Ms | Ibtisam | Abuhaja | Director of Climate Change and Drought Management Dept. | Ministry of Agriculture |
| Palestine | MINISTRY REPRESENTATIVES | Mr | Raed | Abu Rub | - | Ministry of Agriculture |
| Palestine | NGOs REPRESENTATIVES | Mr | Abdul Raouf | Abu Rahmeh | - | Palestine Hydrology Group |