SWIM & H2020 SM

GUIDING RECOMMENDATIONS FOR THE APPLICATION OF THE "MONEVA SYSTEM" TO MONITOR AND EVALUATE THE PARTICIPATORY IRRIGATION MANAGEMENT (PIM) AND IRRIGATION MANAGEMENT TRANSFER (IMT) PROCESS

BASED ON ITS APPLICATION IN JORDAN AND TUNISIA

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V6	GUIDING RECOMMENDATIONS FOR THE APPLICATION OF THE "MONEVA SYSTEM" TO MONITOR AND EVALUATE THE PARTICIPATORY IRRIGATION MANAGEMENT (PIM) AND IRRIGATION MANAGEMENT TRANSFER (IMT) PROCESS BASED ON ITS APPLICATION IN JORDAN AND TUNISIA	Suzan Taha	Michael Scoulos

The SWIM & Horizon 2020 Support Mechanism (2016 – 2018)

The SWIM-H2020 SM is a Regional Technical Support Program that includes the following Partners Countries (PCs): Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, [Syria] and Tunisia. However, in order 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 SWITCH-Med program, and the Clima South program, as well as to projects under the EU bilateral programming, where environment and water are identified as priority sectors for the EU co-operation. It complements and provides operational partnerships and links with the projects labelled by the Union for the Mediterranean, project preparation facilities in particular MESHIP phase II and with the next phase of the ENPI-SEIS project on environmental information systems, whereas its work plan will be coherent with, and supportive of, the Barcelona Convention and its Mediterranean Action Plan.

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

For more information please visit http://www.swim-h2020.eu/ or contact info@ swim-h2020.eu

List of Acronyms

CIHEAM	International Centre for Advanced Mediterranean Agronomic Studies
CWR	Crops Water Requirements
GWP-Med	Global Water Partenership – Mediterranean
Ha	Hectare
HR	Human Resources
IMT	Irrigation Management Transfer
KE	Key Expert
LO	Liaison Officer
M&E	Monitoring and Evaluation
M^3	Cubic Meters
MAP	Mediterranean Action Plan
MED EUWI	Mediterranean component of the European Water Initiative
MONEVA System	Monitoring and Evaluation System
MSSD	Mediterranean Strategy for Sustainable Development
O&M	Operation and Maintenance
PCs	Partner Countries: Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, Syria and Tunisia
PDF	Portable Document Format
PIM	Participatory Irrigation Management
RWS	Relative Water Supply
SWIM	Sustainable Water Integrated Management
SWIM – SM	Sustainable Water Integrated Management- Support Mechanism
UNEP	United Nations Environmental Programme
UNEP/MAP-GEF MedPartnership	Strategic Partnership for the Mediterranean Large Marine Ecosystem
US$	Dollar of United States
V	Variable
WP1	Work Package 1
WUA	Water Users Associations

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1 Background

Between 2013 and 2015 the EU funded SWIM-SM (Sustainable Water Integrated Management –Support Mechanism) project developed an IT application to enable monitoring and evaluation of the Participatory Irrigation Management (PIM) and Irrigation Management Transfer (IMT) process in the project countries (Algeria, Egypt, Israel, Jordan, Lebanon, Libya Morocco, the occupied Palestinian territory, Syria and Tunisia). The application called the "MONEVA" system intends to be a contribution to the scarce information and data available on the evaluation of PIM/IMT programs that are under implementation or completion in more than 60 countries over the world.

The MONEVA system is a decision making tool aimed at evaluating the performance of government agents at the national and regional level (in the regional offices) and water users associations (WUAs) at the local level in the implementation of PIM/IMT programs in a specific country.

The tool, which was a joint effort of the SWIM-SM and the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM) – Bari was tested and implemented in selected pilot areas in two SWIM countries (Jordan and Tunisia).

The system has two major components:

At the government level: this component is addressed to assess the performance of the irrigation agency responsible for the planning and implementation of the PIM/IMT programs at the national level (i.e. the performance of the national administration responsible for PIM/IMT in the country) and at the regional levels (i.e. the regional offices which are responsible for implementing the PIM/IMT programme in the regions). Outcomes, outputs and activities are hence defined and evaluated through a set of indicators developed for this purpose.

At the local level: The other component of the MONEVA is aimed at evaluating the performance of the newly formed Water Users Associations (WUAs). With this purpose, also potential outcomes, outputs and activities were defined as well as the corresponding indicators for their achievement.

The yearly monitoring and evaluation permits to assess the progress in the performance and to identify the corrective actions needed. Both components mentioned above, are part of a single integrated approach and therefore the installation of both components is required for a satisfactory functioning of the system.

The system is a national integrated system in the sense that only one MONEVA system can be installed at the national level. But at the regional level it is possible to install one in each region. Selected information from the WUAs is accumulated at the regional level and some selected information is accumulated at the national level. If the communications among the different levels are kept up to date, the MONEVA system provides updated information at any time of consultation over the levels.

The MONEVA system uses free domain programming language (Access Runtime 2010) and therefore can be freely installed. It is available in English, French and Arabic, which greatly facilitates its adoption in many countries and particularly in those of the Mediterranean and Near East Region. The flexibility built into the MONEVA system permits to select the indicators that will be applied in a specific country and to customise the scoring criteria based on the country's local PIM/IMT experience. This adaptation feature of the MONEVA system is rather unique..

2 Introduction

During the testing of the MONEVA **in the pilot countries of Jordan and Tunisia in 2014**, it became evident that:

1) Some of the data that are necessary for the deployment of the system at all levels (national, regional or local/WUAs levels) were not available and had to be estimated.
2) If data were available, they

a. Were distributed in more than one department
b. Cannot be directly entered into the MONEVA system without further analysis and processing.

3) In the case of Jordan, some of the raw data were found to be available in existing information systems, but requires extraction and processing to aggregate them to the temporal and spatial level needed by the System (annual aggregation versus daily or spot measurements, aggregation at the level of the WUA versus farm units)

4) There are no procedures for calculating the variables/subvariables in a standardized way (at all levels, national, regional and local)

In 2015, based on the recommendations of the partner countries to address the gaps listed above, SWIM-SM provided technical assistance with the aim to help institutionalise the utilisation of the MONEVA in the same pilot countries.

Although the MONEVA system is structured around three levels (See Background above), due to time constraints, the institutionalisation efforts were dedicated to the lower two levels in Jordan - Regional and Local. In Tunisia, because the PIM/IMT process has ended back in 2007 with full transfer of irrigation management tasks from the government to the WUAs, the institutionalisation efforts targeted that level (i.e. the local level - WUAs)

The institutionalisation efforts focussed on the development of data collection, data entry and processing procedures that were depicted in two files:

1. A **document** providing organisational arrangements for data collection, entry and processing procedures, that lays out for each procedure the following:
   a. Objective of the procedure,
   b. Description and relevance to the MONEVA indicators,
   c. How data will be collected?
   d. When it will be collected?
   e. Who is doing what?
2. An **excel file** which prepares all the data for entering them into the MONEVA, with the aim to ensure uniformity in the calculation of variables and facilitate the intermediate calculations.

A proposal for both files was first drafted by SWIM-SM. The two files were **later customised to suit the local specificities of each pilot country based on their application in one regional office in Jordan (South Shuneh Directorate) and five WUAs in both countries**.

Based on the experience gained during the past two years, it is believed that the application of the MONEVA system in a country requires the following:

1) Preparing the grounds for the application of the MONEVA system in the country

2) Developing data collection/entry forms or updating existing forms.

3) Developing adequate procedures for data collection, data processing and data entry.

4) Establishing standard procedures for calculating the indicators/variables.

5) Identifying responsibilities at the various levels

This document is undertaken within the framework of the SWIM & H2020 SM, in order to consolidate the experience gained by SWIM-SM during the testing and the implementation phases throughout two years (2014 and 2015), and presents it whenever possible in the form of guidance, hoping it helps the interested officials in replicating the experience within the pilot countries (Jordan and Tunisia) or any other beneficiary country.

It should be noted, that while this document offers the procedures developed for Jordan at both the regional and local levels, as examples, the countries can also refer to those developed for Tunisia at the

local level, available at www.swim-h2020.eu as **Annexe 4 of the document "Directives pour L'utilisation des Procédures du Système Moneva (NiveauLocal)_Tunisie.pdf"**. The title of the annex is **'Procédures et formulaires de Collecte de données Pour le système MONEVA (Niveau Local)**. **The respective file for processing the MONEVA variables based on the data availability in the selected WUAs in Tunisia (within the region of Sousse), can also be consulted at** www.swim-h2020.eu **under the title "Traitement des données MONEVA (niveau local) _Tunisie.xls.**

3 Overview of relevant information about the MONEVA system

The MONEVA system stands for the computer application that was developed for the comprehensive monitoring and evaluation of the PIM/IMT process throughout its phases. It builds on the internationally known best practices in PIM/IMT planning and implementation and in WUAs operationalisation.

3.1 Objectives of the MONEVA system

The MONEVA system is composed of four main components with the following objectives::

1. Module A: Assessing the degree of the government's political commitment towards the PIM/IMT process and the adequacy of the existing institutional and legal arrangements in support of the establishment of the.
2. Module B: Assessing the performance of the responsible irrigation agencies in the implementation of the PIM/IMT program particularly at the regional level.
3. Module C: Assessing the institutional, financial and technical performance of the Water Users Associations (WUAs).
4. Module D: Assessing the impact of WUAs' establishment .

3.2 The stakeholders and target users

The system aims to monitor and evaluate theree main kinds of stakeholders that are normally involved in any PIM/IMT process:

1) the national irrigation agency responsible for the PIM/IMT process. This agency is usually collabrating with other government organisations that are relevant to the planning and implementation of the process and cooperating with international donors active in the field.
2) the regional offices of the governmental offices that are often the implementers of the PIM/IMT process in the regions
3) the WUAs and the farmers at the local level.

3.3 The structure of the system

In order to enable monitoring and evalutaion (M&E) of the different stakeholders; each at their level, a cascading structure was developed involving , at the government level , two levels of installations/applications (MS Access database) for monitoring and evaluation (one dedicated for the National stakeholders and another one for the regional stakeholders).

At the local level and in order to ensure that the WUAs have the capacity to deal with the system, PDF files consisting of fields that allow for a pre–guided compilation of monitoring data are used. **These will be referred to as the** "**PDF modules at the local level**". The WUAs only have to fill the required monitoring data either "in PDF forms" or "manually"; on a printed version of the PDF forms (in the absence of a computer) and send them to the appropriate regional office where they get integrated into the MONEVA

system at the regional level - for storage and evaluation. The evaluation of the WUA is sent back to the local level (WUA) for assessment and preparation of the Annual Action Plan[1].

[1] This special procedure was developed to cope with the problem that many WUAs still do not have computer facilities

Table 1: The cascading structure of MONEVA

Applicable level	Type of MONEVA Application
National/Central level	MS Access database
Regional level	MS Access database
Local level (WUAs)	PDF files consisting of fields that allow for a pre–guided compilation of monitoring data referred to as the "PDF modules at the local level"

The MONEVA system does not only allow performing evaluation of PIM/IMT at each stakeholder level, it also permits that information stored and/or generated at the lower level can be shared with the stakeholders at the higher level. This allows aggregating the monitoring data for all the WUAs and the regions of the country at the National level, and those of all the WUAs within a region at the regional level, thus enabling performing second level of evaluation through statistical analysis; both temporal and spatial.

4 Guiding Recommendations for the application of the MONEVA in a country

4.1 Pre-MONEVA deployment

The application of the MONEVA system requires taking a decision by the irrigation agency involved in the participatory irrigation management and irrigation management transfer process to apply the MONEVA system in the country. The application of the system could be undertaken through a phased implementation involving pilot region(s) at the beginning to be expanded gradually into other regions.

Once a decision is taken, it becomes the role of the directorate or the department, which is responsible at the National level for PIM/IMT and for monitoring the performance of the WUAs, normally referred to as the WUA support Unit (WUASU) or Directorate to deploy the system in the pilot areas and provide support to the regional offices and WUAs where the system is to be deployed.

The following bullets are recommended actions to be undertaken once the deployment of the MONEVA is agreed upon

1) **Appoint a national administrator and Install the National component of the system at the National level:** Normally the system at the national level should be installed in the department/directorate, which is responsible for the PIM/IMT process and for monitoring the performance of the WUAs.

   A detailed guide of the system's installation and operation at the national level is available as part of the MONEVA system at www.swim-h2020.eu. The guide also includes the minimum set of "System prerequisites" (Hardware and Software prerequisites) for the system installation at each level (national, regional and local)

2) **Select the pilot region(s) and the pilot WUA(s)** within the region(s) in which the system will be tested.

3) Assign MONEVA **Regional Administrator (Regional Officer (RO))** for **each pilot region** as per the proposed scope of work detailed in Annex 1 and **install** the **regional component of the MONEVA** system **in the selected regional office(s)** using the guide developed for this purpose at the regional level.

4) Assign MONEVA **Local** Officer (LO) for each pilot WUA as per the proposed scope of work detailed in Annex 2.

5) **Train the nominated national, regional and local officers on the MONEVA**. Targeted Technical Assistance from SWIM & H2020 SM should be possible under SWIM II. CIHEAM-Bari can also provide expert assistance. In addition, use can be made of the experience gained by the independent consultants who were involved in the pilot implementation in both Jordan and Tunisia (two experts in

each country), in addition to the knowledge gained by the implicated partners at all levels in both countries. Training can also include

a) All the O&M directors of the regional office(s)
b) All the officers engaged in PIM/IMT at the regional level
c) The Information and Technology (IT) specialist who are mandated to provide IT support to the users.
d) Donors and projects active in PIM/IMT

6) **Get familiar with the system's structure** (set of indicators, output, and outcomes), a task that should be undertaken by the designated national administrator. This can be done through close examination of the structure of the system which is easily accessed in a dedicated section of the system (under utility and tools).

7) **Establish an ad-hoc committee at the national level involving**, in addition to the MONEVA National and regional Administrators/ officers, relevant officials from the O&M departments of the irrigation agency, and those responsible for PIM/IMT. The role of this committee is to :

   a. Advise the National Administrator on the PIM/IMT dates
   b. Jointly select with the national administrator the set of indicators that will be applied for the country at all levels (national, regional and local).
   c. Review the scoring criteria for the applicable indicators based on which the evaluation will be performed and modify them if needed to suit the local conditions of the country.

For more details See the Section titled "Establishment of the MONEVA settings by the National Administrator" below. **It should be noted that** the selection of the indicators the at the local level, requires that **the above committee invites selected WUAs leaders** in order **to ensure that the local experience of the WUAs and farmers is taken into account**.

4.2 Establishment of MONEVA National Settings by the National Administrator

Before the system can be used by any other user at any level, the **National Administrator** has the responsibility of entering the General Settings of the system. These settings are essential parameters that will be applied throughout the country. They are all listed in the left side of the screen shot (Figure 1) and include the following:

1. **PIM/IMT dates:** These dates have been introduced based on the pilot experience. The following is a list of the PIM/IMT dates used in the MONEVA, together with their graphical presentation (Figure 2)

   a) *The year in which the PIM/IMT process was started*,
   b) *The expected duration of the PIM/IMT program*,
   c) *The reference year* is the year before the start of the annual monitoring in the MONEVA system and up to which cumulative data for certain indicators need to be entered. .This year was introduced in order to account for the experience in PIM/IMT prior to the start of use of the M&E system. It refers to the year up to which the monitoring data for certain indicators will be accumulated. They are entered into the system once at the beginning, when a country (with an ongoing PIM/IMT program) starts populating the system with data for the first time.
   d) *The number of years for which the PIM/IMT program is expected to be extended*, and
   e) *The date of the last update of the time settings.*

   While the date of a) is used to determine the age of the PIM/IMT process, which is needed for the evaluation of some indicators for which the scoring criteria depends on the stage of the development of the PIM/IMT[2], The dates related to b), c) and d) are needed to decide the expected date of

[2] For example, the performance of an indicator measuring the change in the allocation of financial or human resources during two consecutive years would be considered good if, during the first five to ten years of the PIM/IMT life time, the value of the

completion of the PIM/IMT process, in order to activate certain indicators that are used for end of PIM/IMT evaluation.

Figure 1: Main Menu of the MONEVA and Screenshot of the Scoring Criteria

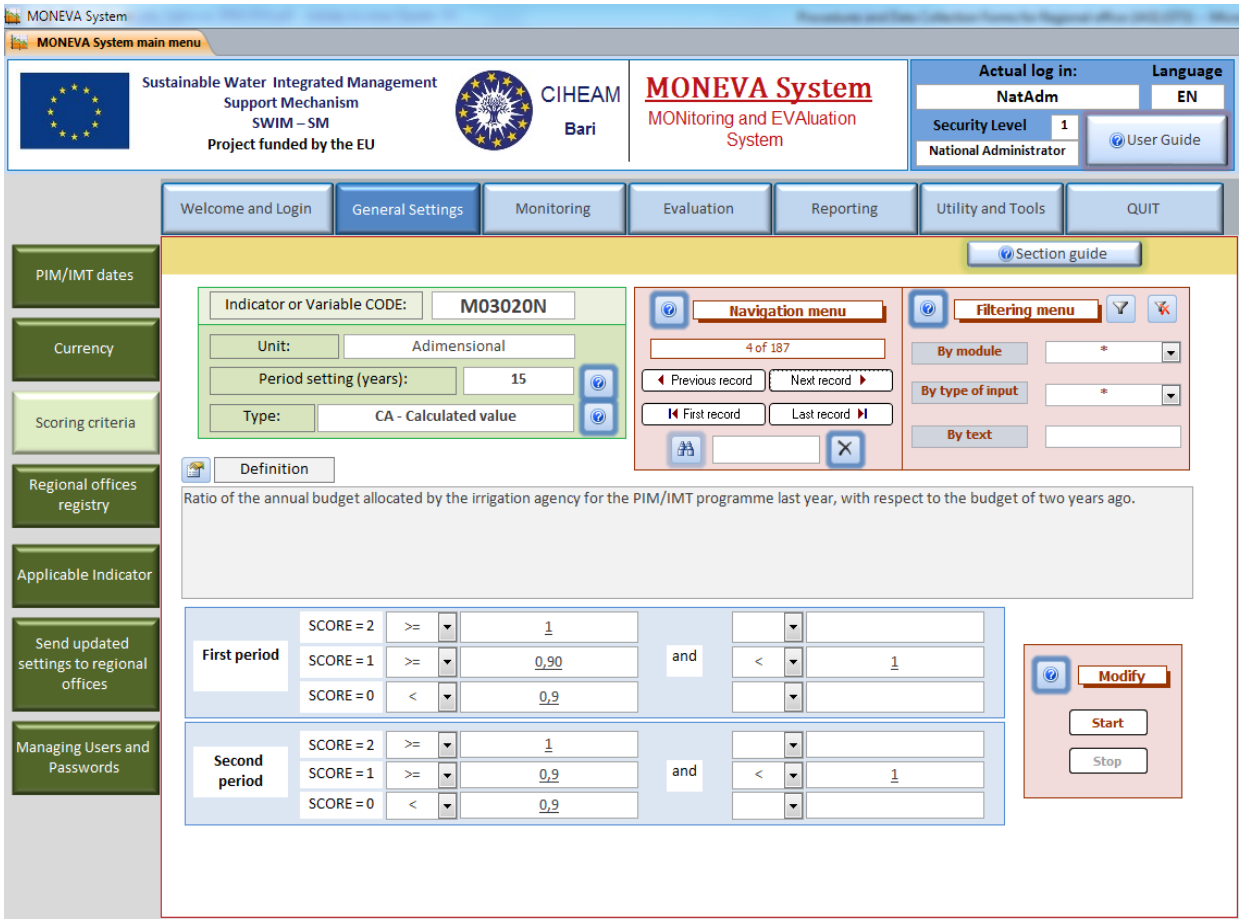
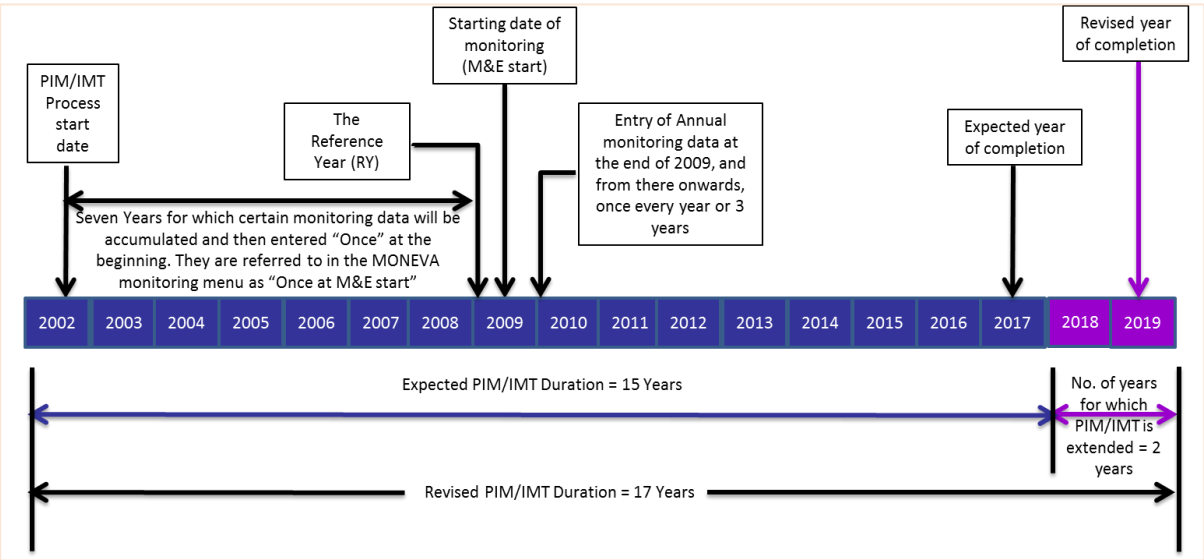


Figure 2: Graphical presentation of PIM/IMT dates relevant to the MONEVA, with fictitious example



indicator was increasing. After 5-10 years, and as more areas and O&M tasks are transferred to the WUAs, less governmental resources should be allocated, and hence a decrease in the value of the indicator is warranted.

2. **The currency setting:** establishes the exchange rate of the US$ with the local currency. This is used in some indicators where the scoring criteria is based on values set in US$ and where conversion from local currency to US dollars are needed
3. **The scoring criteria:** This setting permits the National Administrator after consultations with the ad-hoc national committee established above (See bullet 7 of the section "Pre-MONEVA deployment"), to change the scoring criteria for any indicator to reflect the local experience of the country.

   In addition, it allows changing the period setting; which refers to the number of years after which the scoring criteria for an indicator might vary. For example a growing number of staff working in the irrigation agency is desirable during the first development phase (**the first period,** Figure 1) of the PIM/IMT programme, but as time evolves (say after some 15 years; referred to as **the second period in** Figure 1) the number of staff should decrease annually.

4. **Regional offices registry.** This is a registry of all the Regional Offices that are or will be involved in the use of MONEVA. For each office, a unique code is defined and some other specific data

5. **Applicable indicators:** In this section all the indicators of the system are presented (Figure 3) and the National Administrator will decide, together with the ad-hoc national committee established above (See bullet 7 of the section "Pre-MONEVA deployment"), which indicators will be applicable ("Applicable indicators") in the specific country. In the absence of such a committee, this responsibility can be delegated to the National Administrator.

   ***Note**: The Indicators and the Variables that are used to measure the indicators are distinguished in each module by their codes, whereby the codes of the indicators of Module "A" start with the letter M, while those of Modules B, C and D, start respectively with N, P and R. On the other hand, the codes of the variables always start with the letter of the Module they belong to.*

   Since some of the settings require a good understanding of the MONEVA , they should be established after appropriate training has taken place.

   Figure 3 illustrates the screen where the selection of indicators can be made and shows that for every indicator, there are two buttons with the headings: "active" and "scored". If the "active" button is pressed, the indicator will be inactivated; and the overall maximum scoring of the related outputs and outcomes will be adjusted accordingly. Being inactive, all the variables that are used to calculate such indicator will also be deactivated and put out of use. On the other hand, if the "scored" button is pressed for a given indicator, then the overall maximum scoring of the outputs and outcomes related to the said indicator will be adjusted as if the indicator is de-activated, while still maintaining all the variables that are used to calculate the said indicator. This second alternative is relevant to maintain certain variables that are used to calculate more than one indicator. National Administrators must therefore study carefully the variables that determine one indicator before deactivating it. This can be done through close examination of the structure of the system which is easily accessed in a dedicated section of the system (under utility and tools). Should the country decide to use the indicator later, both de-activation and de-scoring can be reversed.

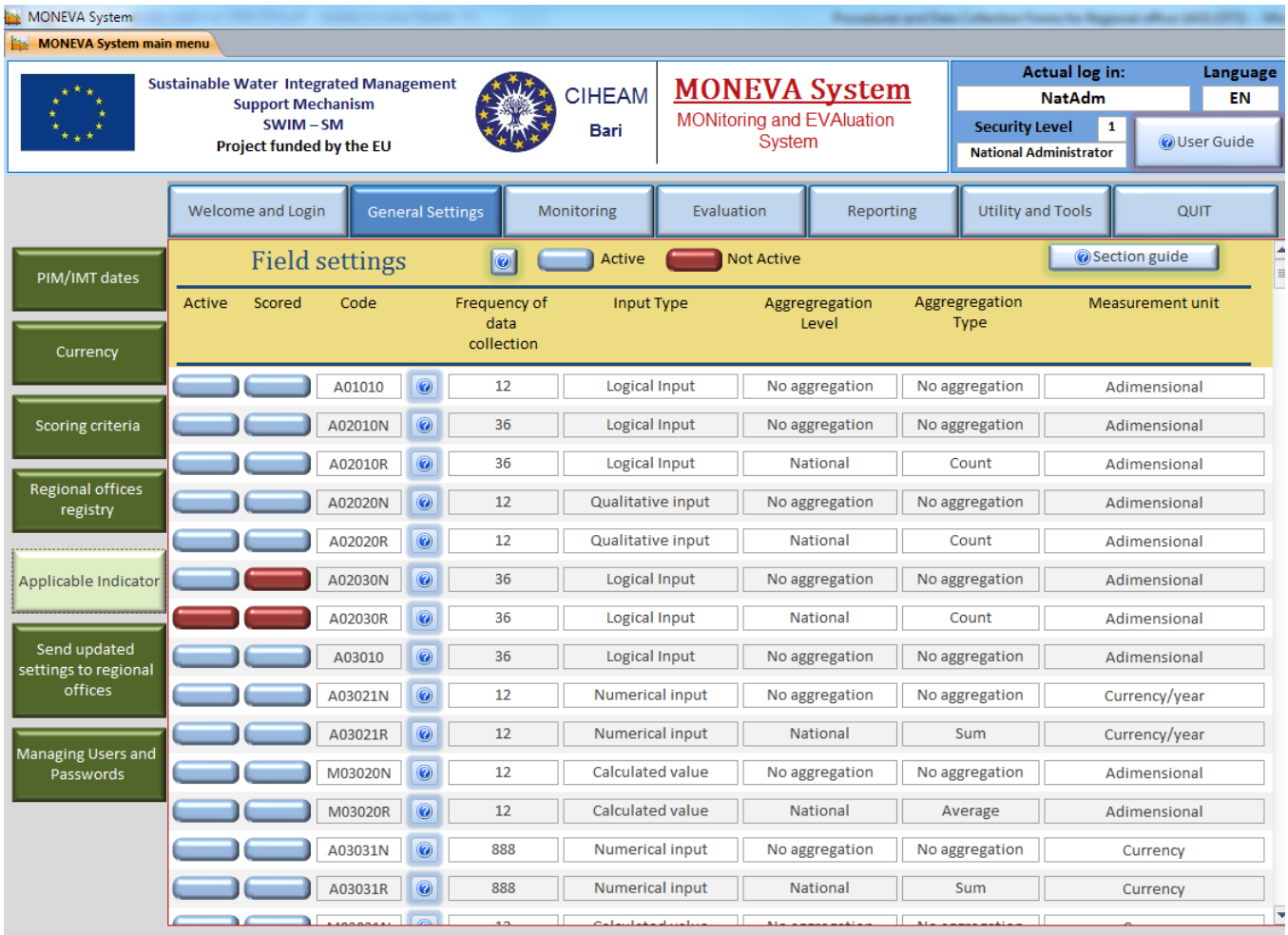
6. **Managing Users & passwords:** With this sub-menu, the Administrators can define the passwords of the different users at the national and regional levels

7. **Send the Updated settings to the Regional Offices:** Once the system's settings are established at the National level, the **national administrator should send these settings to the regional officer** and **communicate the users' names and passwords** to the system's users at the national and regional levels.

   An important note is in order here. Should some indicators at the local level (indicators for which the codes start with the letter C or D) get inactivated, the national administrator **should generate**

new PDF files/modules, before distributing them to the regional administrator(s) who in turn will disseminate them to the WUAs. The generation of the new PDF files/modules is required in order to avoid unnecessary effort on the part of the WUAs to collect data that are not needed any more.

Figure 3: Screenshot of the Applicable Indicators



For a detailed description of the settings to be established or modified, the reader is referred to the User's Guide which is accessible from every section of the MONEVA available at www.swim-h2020.eu. A brief description of the same settings is also available in the short document that was prepared by SWIM-SM, titled "The MONEVA system. A monitoring and evaluation (M&E) system for Participatory/Transfer Irrigation Management programs (PIM/IMT)", under the same title of this section[3]. The document can be found also under www.swim-h2020.eu.

4.3 Retrieval of the settings established at the national level by the Regional Administrator and fill in the local registry

At the regional level, the regional administrator/officer should follow the guide within the MONEVA system in order to:

1. **Retrieve all the settings** that have been established at the National level (PIM/IMT dates, currency, scoring criteria, and the regional offices registry (including that of his/her region).
2. **Update/modify the registry of his/her regional office** as needed.

[3] i.e. "Establishment of MONEVA National Settings by the National Administrator"

3. **Fill in the Local offices registry**, which is a registry of the WUAs that will participate in the M&E system. In this context, it should be noted that "local offices" refers to the "WUAs.
4. **Manage users and passwords at the regional level**, and distribute them to the users at his/her level
5. **Disseminate the MONEVA PDF files** (modules) **relevant to the local level to the WUAs** either by email, on a digital support (CD, USB...) or as hard copies, depending on the availability of soft and hard wares at the Local Office,

4.4 Starting the Monitoring Process

Monitoring is carried out at three levels: national, regional and local, through **independent data collection and processing and subsequent data entry at each level**. At the national and regional levels data is entered directly into the system, **using the monitoring menus within the MONEVA system** that are dedicated for that purpose. At the **local level**, **data is entered either manually** into the printed version of the PDF files **or electronically** depending on the level of the IT preparedness of the WUA.

As indicated earlier, the system allows the transfer of information from one level to the other as required to maintain the integrity of the system.

4.4.1 Types of data, variables and indicators available in the MONEVA system at all levels

The following table lists the types of variables and indicators that are found in the MONEVA system.

Table 2: Types of data (variables and indicators) in the MONEVA system

Type	Description	Example
Logical Indicators (Y/N)	They consist of a statement that the users of the system have only to respond to with "Yes" or "No"; as applicable at each level (national, regional or local).	**A01010**: A government statement declaring the PIM/IMT program a national priority is available
Numerical indicators	They provide numerical information about an activity that has been carried out . Numerical indicators consist of one or more numerical variables. They are needed to determine the value of the numerical indicators.	**M03020N:** Percentage of the annual budget allocated by the irrigation agency for the PIM/IMT programme last year with respect to the budget of two years ago
Numerical & qualitative indicators.	They are essentially qualitative indicators whereby consulted people express qualitative opinions.	**A02020N & A02020R**: "Degree of effectiveness of coordination among the institutions participating in PIM/IMT program in your region: (2) satisfactory (1) medium (0) not at all.
		C02050: Is the elections of the Administrative Council made through: secret voting, selection, not all
	Results for the Qualitative indicators can in some cases be expressed as percentages of the total number of people consulted/surveyed	**C07080**: Degree of government staff satisfaction with respect to performance of WUA

Type	Description	Example
Information data	They are not truly indicators but provide information that helps to evaluate the results of some of the numerical indicators.	Percentage of WUA serviced areas that are irrigated under surface irrigation, sprinklers and drip.

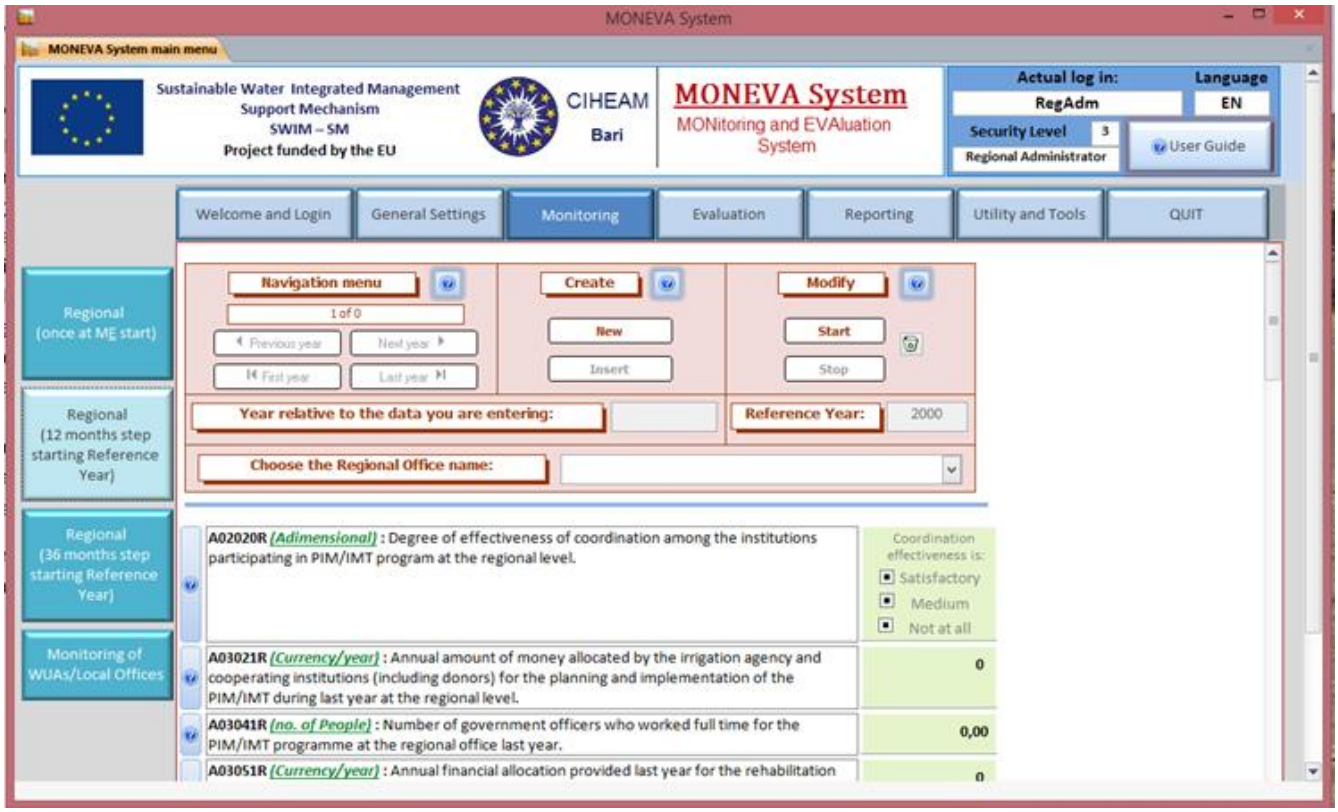
The **monitoring data can also be classified in three groups according to the frequency of update in the MONEVA system:**

1. Data that needs only to be entered once called in the MONEVA menu: "once at the M&E start" (See the upper box at the left side of Figure 4. Also refer back to Figure 2above), as for example fixed information which do not change with time such as the irrigable areas serviced by the WUAs, or cumulative information up to the reference year.

2. Data that changes often and is requested annually (12 months) called in the menu; "12 month step starting the reference year".

3. Data that does not change often and is requested only every 36 months (3 years, called in the menu: "36 month step starting at the reference year".

Figure 4: Screenshot of the 12 months step of monitoring at the regional level



Finally, **numerical** indicators and variables can also be classified according to the business category. Table 3 lists the different categories according to their occurrence in each level (regional and local). See also Annex 3 and Annex 4 for the complete list of the MONEVA indicators/variables, applied in Jordan (marked in bold) and of the additional sub-variables created by SWIM-SM in order to calculate these variables/indicators (indented). Knowing the business category for each indicator/variable is important to enable defining where the data will be collected from.

Table 3: Types of variables and indicators by business category (Regional and Local)

Business Category	Regional Level	Local Level
Technical	√	√
Qualitative data	√	√
Financial and administrative	√	√
Human Resources	√	√
Socio economical	√	√
Farmers awareness	√	
Training of the WUA Supporting staff	√	
Training of the WUAs	√	
Rehabilitation	√	
WUAs Establishment & Management transfer	√	
Environment		√
Water productivity		√

4.4.2 Development of the procedures and data processing for MONEVA

The testing of the MONEVA in the pilot areas during 2014 made it evident that some of the data variables and numerical indicators need extra data (variables) which were not readily available at the national, local or regional levels. Hence, clear data collection, entry and processing procedures are required. To illustrate this situation, the case of the indicator "P03072" defined as the "Relative Water Supply (RWS)"[4] is taken as an example. The value for the indicator, which gives an indication of the water scarcity in the WUA and the system's capacity to satisfy the Crops Water Requirements (CWR) is obtained by dividing two variables (V)'s as follows:

P03072 = (P03071/C03072)*100

Whereby,

P03071 = Variable 1 (V1); the Water consumption per irrigated area (obtained by dividing the total farm irrigation supplies by the irrigated areas), and

C03072 = V2; the Estimated annual crop water requirements in the area or region where the WUA is located; expressed in cubic meters (m^3) per hectare (ha).

Most of the WUAs' leaders do not have a clear notion about CWR in their area (V2). However, they have good records of how much water the farmers receive (variable V1). Hence, it is necessary to develop a procedure to measure/estimate the CWR (V2) in each region, based on the local experience and research data. Once such information is available, the WUAs are in a good position to enter the CWR values (V2 or C03072) in the **PDF files/modules at the local level.**

In order to facilitate the collection of the data needed for monitoring PIM/IMT, and enable the processing of such data in a standardised manner in preparation for their entry into the MONEVA, SWIM-SM developed a set of procedures for most of the numerical data variables needed by the MONEVA System for the calculation of the indicators. It is envisaged that with the progressive application of MONEVA, the need for such procedures will decrease but in the initial stages, they can provide useful support.

In view of the above, the following elements of support were developed, namely:

1. "MONEVA data processing" (Excel File) at the **regional level** (Jordan only)

[4] Also referred to as the "Scarcity Ratio with respect to the crop water requirements" in the MONEVA system, which is equal to the Ratio of the water supplied to the farms per irrigated area with respect to the estimated crop water requirements in the area or region of the WUA

2. "MONEVA data processing" (Excel File) at the **local level** (Jordan and Tunisia)
3. "Procedures and Data collection Forms for the MONEVA System" at the **regional level** (Jordan only)
4. "Procedures and Data collection Forms for the MONEVA System" at the **local level** (Jordan and Tunisia).

All the above files are available as references for replication within the same country at www.swim-h2020.eu as per the table 4 below. For other countries of the region, it is suggested that these files are reviewed and customised to suit their local conditions. A detailed description of these files mostly based on their application in Jordan will follow.

Table 4: Types and Names of Supporting files available for the application of the MONEVA Procedures at SWIM-H2020 web site

		Name of the Files developed per country	
Type of File	**Level of Applicability**	**Jordan**	**Tunisia**
MONEVA Data Processing files (Excel files)	Regional Level	MONEVA Data processing (Regional Level).xls	N.A.
	Local	MONEVA Data processing (Local Level).xls	Traitement des données MONEVA (niveau local) _Tunisie.xls
MONEVA Procedures and data collection forms	Regional Level	Guiding Recommendations4ApplyingMONEVA-Annex7(ProceduresRegionalLevel).pdf	-
	Local	Guiding Recommendations4ApplyingMONEVA-Annex8(ProceduresLocalLevel).pdf	Annexe 4 of the document "Directives pour L'utilisation des Procédures du Système Moneva (NiveauLocal)_Tunisie.pdf". The title of the annex is 'Procédures et formulaires de Collecte de données Pour le système MONEVA (Niveau Local)

4.4.2.1 The types of indicators/variables that the proposed procedures cover

Procedures were developed by SWIM-SM for most of the following:

1. Numerical indicators/variables
2. Qualitative and quantitative indicators/variables.
3. Information data

As for the logical indicators, they can be respectively answered at the regional level by the MONEVA Regional administrator/Officer (RO) with the assistance of the same ad-hoc committee established above (See bullet 7 of the section "Pre-MONEVA deployment"), **or at the local level**, by the MONEVA LO with the assistance of the president of the WUA. It is the responsibility of the designated MONEVA ROs and LOs who are responsible for the coordination of the collection of the monitoring data and their processing and for the subsequent entry of the processed data into the MONEVA, to ensure that the logical indicators are answered as applicable and that the responses describes best the situation at their respective level. **Annex 5 and Annex 6 give a list of the logical indicators at the regional and local levels, respectively.**

4.4.2.2 The MONEVA data processing Files (Excel Files)

The MONEVA data processing files (local and regional) are Excel files where different sheets are included in order to facilitate and guide the user in the preparation of the monitoring data that need to be entered into the MONEVA system; each at his/her respective level. The aim of this support element is to ensure uniformity in the calculation of variables prior to their entry into the MONEVA system, and facilitate the intermediate calculations (often involving simple arithmetic calculations).

Normally the responsibilities of "data processing" using these files and "data entry" into the MONEVA system should be clearly designated to the "MONEVA officers" from the very beginning, at both the regional and local levels in each country (See proposed scope of work for these officers in Annex 1 and Annex 2; respectively.)

Although the processing files do not cover the national level, as it was outside the scope of work of SWIM-SM during 2015, however they can be easily developed following the guide in the Section titled "Methodology for the development and testing of the procedures for data collection" below.

As indicated above, the elements of support have been developed for the Regional level in Jordan and for the Local level in both Jordan and Tunisia. Below is a general description of the sheets that are contained in the MONEVA data processing file at the local level (Table 5) and at the regional level (Table 6) mostly based on what has been developed for Jordan. **As mentioned in the "Introduction"**, the countries can refer to those developed for Tunisia at the local level, which are available at www.swim-h2020.eu under the title "Traitement des données MONEVA (niveau local)_Tunisie.xlx. See also Table 4.

Table 5: "MONEVA Data Processing (Local Level).Xls" File with the main calculation sheets and their description

Category	Name of sheet	Description
Main sheets	1. WUA fixed info	This sheet includes all the **fixed information about the WUAs** that rarely changes. It represents a stock of fixed information for the WUA under consideration which is either (a) necessary for conducting intermediate calculations (Example on such information is the irrigable areas used in the calculation of several variables prior to their entry into the MONEVA system such as the expected maintenance cost per hectare) or (b) needed to be entered directly into the MONEVA system (Examples: WUA Name and code, type of WUA, date of establishment, date of transfer agreement, the agro-climatic region in which the WUA is located, etc.).
	2. Input2MONEVA	In this sheet, **all the numerical variables/subvariables and indicators that require calculations - prior to their entry into the MONEVA - are listed**. Two types of variables/subvariables and indicators are distinguished here: - Those that require direct data entry using logbooks available WUAs, and - Those requiring more complicated processing. The user is guided in each case as to what he/she needs to do (See Figure 5). In case the variable/sub-variable/indicator requires complicated processing, he/she is instructed to fill the specific cells in the **"Processing"** sheets with the relevant data (See bullet 3), and is forwarded to those cells through a mouse click. Once the relevant data is entered in the "Processing" sheet, automatic calculations of these variables/subvariables and indicators takes place which are reflected in the "Input2MONEVA" sheet. Once all data are entered, the results available in the "Input2MONEVA" sheet can be entered directly to the monitoring section of the MONEVA using the menu system.
	3. Processing sheets	These sheets contain all the relevant data that need to be entered in order to enable the calculation of **specific numerical indicators (that require more complicated calculations).** Once relevant data is entered, the calculations are automatically undertaken in the processing sheets and get reflected in the "Input2MONEVA" sheet. **In the case of Jordan**, since a lot of the required data reside in **raw** Oracle database format (in the so-called Water Management Information System (WMIS) available at JVA), a script was developed to extract these data from the WMIS into text files; each file corresponding to the calculation of a specific variable/indicator for a given year. The said files were thereafter linked through visual basic (VB) to the "**MONEVA Data Processing.xls**" file. In order to execute the VB program, the user would just need to click on the indicator/variable under consideration in the "**Input2MONEVA**" sheet and the results of the processing of the raw data get stored in a specific processing sheet, named the "WMIS results" and get reflected automatically in the "Input2MONEVA" sheet.
Complementary sheets	4. Water Needs	This table provides a standardised calculation of the **average Crop Water Requirements (CWR) for** the pilot region under consideration in the case of Tunisia. In the case of Jordan where the WUAs cover only four climatic regions compared to six in Tunisia, the table calculates the CWRs for **every region of the Jordan Valley.** By

Category	Name of sheet	Description
		inputting the "Region" where the WUA is located into the 'WUA fixed info' sheet, the specific CWR of a given WUA will be estimated. In the case of Tunisia, all the WUAs that fall within the central east region of Tunisia can make use of this sheet.
	5. LocalAll	This is a **reference table** containing all the indicators at the local level and other details. **Normal users would not need to use it at all.** Advanced users may use it to consult specific details of a variable or indicator.

Figure 5: Screenshot of the Input2MONEVA sheet – Local Level

Year	2014					
Variable Code as applicable	Frequency	Unit	Definition English	Definition Arabic	Formula/Value as applicable	Type of Entry
C03021	12	m³Ha	Planned water allocation (at the head of the system) of last year expressed	كميات المياه التي تم التخطيط لتوزيعها (على رأس نظام الري) للعام الماضي ب م٣/هـ.	#DIV/0!	Formula - معادلة
C03021.1	12	%	% Allocation (last year)	نسبة التزويد المائي (خلال العام الماضي)	100%	Data entry أدخال المعلومات
C03072	~~888~~ 12	m³Ha	Estimated annual crop water requirements in the area or region where the WUA is located expressed in m3 ha.	الاحتياجات المائية السنوية المقدرة للمحاصيل المروية ضمن المنطقة أو المساحة المخدومة من قبل جمعية مستخدمي المياه (م٣ / هكتار).	#DIV/0!	هذه الخانة يتم تحديثها تلقائيا عند الحصول على المعلومات المرتبطة بها من مديرية التحكم (WMIS). انقر على المتغير C03072 لتحديث المعلومات للعام قيد النظر.
C03023	12	m³	Total amount of water received by the WUA at the main intake(s) and distributed during last year through pressurised system expressed in m3.	اجمالي كمية المياه التي تلقتها جمعية مستخدمي المياه على المأخذ الرئيسي (المآخذ الرئيسية) والتي وزعت خلال العام الماضي من خلال نظام الري المضغوط(م٣).	3573763.2	هذه الخانة يتم تحديثها تلقائيا عند الحصول على المعلومات المرتبطة بها من مديرية التحكم(WMIS) . انقر على المتغير C03023 لتحديث
C03024	888	Ha	Irrigable area: This is the maximum area that can be irrigated within the WUA irrigation scheme if there no limitation of water supply. Note: It is calculated by summing the net irrigable area of all farms inside	المساحة القابلة للري: هي الحد الأقصى للمساحة التي يمكن ريها ضمن مخطط الرى التابع لجمعية مستخدمي المياه في حال لم يكن هناك أي قيود على كميات التزويد المائي. ملاحظة: يتم احتساب ذلك عن طريق جمع صافي المساحة القابلة للري لجميع المزارع	1026	Formula - معادلة يتم تحديثها فقط بعد إدخال المساحات القابلة للرى في ورقة "المعلومات الثابتةWUAFixedInfo". انقر هنا لادخال تلك المعلومات في الورقة المذكورة
C03041	12	m³	Total volume of water actually received at the main intake(s) during the peak month of demand of last year expressed in m3	إجمالي حجم المياه الذي تلقته كل المآخذ الرئيسية خلال شهر ذروة الطلب في العام الماضي (م٣)	363398.4	هذه الخانة يتم تحديثها تلقائيا عند الحصول على المعلومات المرتبطة بها من مديرية التحكم(WMIS) . انقر على المتغير C03041 لتحديث المعلومات للعام قيد النظر. Automatic update upon

Table 6: "MONEVA Data Processing (Regional Level).Xls" File with the main calculation sheets and their description

Category	Name of sheet	Description
Main sheets	1. RegionsFixed Info	This sheet includes all the **fixed information about the regional office** that rarely changes. It represents a stock of fixed information for the regional office under consideration including the list of the WUAs serviced by the regional office, their codes, the total number of farm units within the regional office (served by the WUAs or those still served by the regional office), etc.
	2. CountryMasterTables	These tables were developed specifically for Jordan and should be reviewed to see if they are relevant to other countries.
	3. Input2MONEVA	In this sheet, **all the numerical variables/subvariables and indicators that require calculations - prior to their entry into the MONEVA - are listed**. Two types of variables/subvariables and indicators are distinguished here: - Those that require direct data entry using logbooks available at the regional office, and - Those requiring more complicated processing. The user is guided in each case as to what he/she needs to do (See

Category	Name of sheet	Description
		Figure 6). In case the variable/sub-variable/indicator requires complicated processing, he/she is instructed to fill the specific cells in the **"Processing"** or the "**CumulativeData**" sheets with the relevant data (See bullet 4), and is forwarded to those cells through a mouse click. Once the relevant data is entered in the "Processing" or the "**CumulativeData"** sheets, automatic calculations of these variables/subvariables and indicators takes place which are reflected in the "Input2MONEVA" sheet. Once all data are entered, the results available in the "Input2MONEVA" sheet can be entered directly to the monitoring section of the MONEVA using the menu system.
	4. Processing sheets	Two types of processing sheets exist at the regional level: **- "12&36MonthsProcessing" sheet:** This contains all the relevant data that need to be entered into the MONEVA every 12 or 36 months in order to enable the calculation of **specific numerical indicators (that require more complicated calculations).** Once relevant data is entered, the calculations are automatically undertaken in the processing sheets and get reflected in the "Input2MONEVA" sheet. **- CumulativeDataProcessing" sheet**: Same as above but refers to cumulative data that need to entered once into the MONEVA system (at the starting date of monitoring (M&E start date) as per Figure 2 above)
	5. RegionalAll	This is a **reference table** containing all the indicators at the regional level and other details. **Normal users would not need to use it at all.** Advanced users may use it to consult specific details of a variable or indicator.

Figure 6: Screenshot of the Input2MONEVA sheet – Regional Level

Year	2014					
Variable Code as	Frequen	Unit	Definition		Formula/Value as	Type of link (data entry or automated)
A02020R	12	Adimensional	Degree of effectiveness of coordination among the institutions participating in PIM/IMT program in your region. Note: Coordination is effective	درجة فعالية التنسيق بين المؤسسات المشاركة في برنامج PIM / IMT على المستوى الإقليمي. ملاحظة: "يكون التنسيق فعالاً عندما تقوم جميع المؤسسات المشاركة بمسؤولياتها	(1) Medium	هذه الخانة يتم تحديثها تلقائيا عند إدخال البيانات المرتبطة بها في ورقة "Processing" . انقر هنا لتحديث المعلومات للعام قيد النظر. Automatic update upon data
A03021R	12	Currency/year	Annual amount of money allocated by the irrigation agency and cooperating institutions (including donors) for the planning and implementation of the PIM/IMT during last year in	إجمالي المبلغ السنوي من الأموال المخصصة من قبل وكالة الري والمؤسسات الأخرى المتعاونة (بما في ذلك الجهات المانحة) من أجل التخطيط لبرنامج PIM / IMT وتنفيذه خلال العام الماضي في	154000	Formula - معادلة
A03021R.1	12	Currency/year	Annual amount of salaries allocated by the irrigation agency for the planning and implementation of PIM/IMT	قيمة الرواتب التي تم تخصيصها العام الماضي من قبل وكالة الري بهدف التخطيط ل وتنفيذ الإدارة ة التشاركية لمياه الري ونقل الصلاحيات في منطقتكم	26250	هذه الخانة يتم تحديثها تلقائيا عند إدخال البيانات المرتبطة بها في ورقة "Processing" . انقر هنا لتحديث المعلومات للعام قيد النظر 'Automatic
A03021R.2	12	Currency/year	Annual amount of money allocated by the donors for the planning and implementation of PIM/IMT during last year in	قيمة المبالغ التي تم تخصيصها العام الماضي من قبل الجهات المانحة بهدف التخطيط ل وتنفيذ الإدارة ة التشاركية لمياه الري ونقل الصلاحيات في منطقتكم	127750	هذه الخانة يتم تحديثها تلقائيا عند إدخال البيانات المرتبطة بها في ورقة "Processing" . انقر هنا لتحديث المعلومات للعام قيد النظر 'Automatic
A03031R	888	Currency	Cumulative amount of money allocated for your region by the irrigation agency and cooperating institutions (including donors) for	القيمة التراكمية للأموال المخصصة لمنطقتكم من قبل وكالة الري والمؤسسات الأخرى المتعاونة (بما في ذلك الجهات المانحة) من أجل تخطيط وتنفيذ PIM /	122340	Formula - معادلة
A03031R.1	888	Currency	Cumulative Amount of **salaries** allocated by the **irrigation agency and cooperating institutions** for the planning	القيمة التراكمية للرواتب التي تم تخصيصها من قبل وكالة الري والمؤسسات المتعاونة الأخرى بهدف التخطيط للإدارة التشاركية لمياه الري ونقل الصلاحيات في	122340	هذه الخانة يتم تحديثها تلقائيا عند إدخال البيانات المرتبطة بها في ورقة "CumulativeData" . انقر هنا لتحديث المعلومات للعام قيد
A03031R.2	888	Currency	Cumulative Amount of **money allocated by the donors** for the planning and implementation	اللقيمة التراكمية للمبالغ التي تم تخصيصها من قبل الجهات المانحة بهدف التخطيط للإدارة التشاركية لمياه الري ونقل	0	هذه الخانة يتم تحديثها تلقائيا عند إدخال البيانات المرتبطة بها في ورقة "CumulativeData" . انقر هنا

4.4.2.3 Procedures and data collection forms

In general, Excel files are not very suitable for long text descriptions and for this reason many descriptive details have been avoided in the "MONEVA Data Processing" files in order to concentrate on numerical information and calculations. Hence, the user may find that some more detailed explanations are needed to understand how the data will be collected and processed.

With this purpose, the "Procedures and Data Collection Forms for the MONEVA System" at the Regional Level and at the Local level, were developed as a Word Document. These are documented in Annex 7 and Annex 8, reflecting the required procedures to collect and process data at the regional and local level; respectively (based on the applications of these procedures in Jordan). The said annexes complement the Excel Tables 'MONEVA Data Processing' files discussed above at the corresponding level, where all the **numerical** variables to be entered in the MONEVA monitoring menus, are listed in the "Input2MONEVA" sheets. Some of the values to be entered are simple and can be easily filled by the users. However, other values are more complex requiring some intermediate calculations or clarifications. These Annexes (**Annexes 7 and 8**) are precisely addressed to these more complex variables by providing guidance on how to collect them.

4.4.2.3.1 Methodology for the development and testing of the procedures for data collection

One of the main components of a good M&E system is the provision of organizational arrangements for data collection that is capable of recording progress over time. An M&E system without such arrangements cannot be sustained or institutionalised. Provisions for data management, analysis and reporting are also essential in this regard.

Based on SWIM-SM experience during the pilot implementation, below is a quick summary of what can be done by a country willing to develop its own procedures in support of MONEVA deployment:

- Get familiar with the definition of the variables and indicators used by the MONEVA system, together with the frequency of their update. This can be done through close examination of the structure of the system which is easily accessed in a dedicated section of the MONEVA system (under utility and tools).
- Select the indicators applicable for each level (national, local and regional).
- Identify the data that are required by the MONEVA system at each level, but are not being collected by the corresponding stakeholders.
- Develop new stand-alone forms and procedures for collecting non-available data and refine existing ones whenever needed, **using whenever possible the procedures developed by SWIM**.
- Integrate the collection of the additional data to the extent possible with existing data collection forms and procedures
- Develop an implementation work plan
- Designate a national and a regional officer who will be working closely with the WUAs in the application of the new procedures and the MONEVA system,
- Agree on the optimal way to conduct the field measurements and to train on the new procedures. A combination of group and individual training should be adopted.
- Agree on the training dates
- Identify who will be doing what and when.

Specific Considerations at the local level

- Conduct Dedicated field meetings with the WUAs in cooperation with the designated national and regional officers with the objective to:
  - ✓ Select the MONEVA Officer in each WUA
  - ✓ Conduct training for the relevant WUA staff on the data collection forms and procedures
  - ✓ Define the responsibilities for each form/procedure
  - ✓ Define the scope of Work for the MONEVA Officer in the WUA (See Annex 2)
  - ✓ Designate people from the WUA for field work and measurements
  - ✓ Select (1) the turnouts for flow and pressure measurements, (2) targeted farmers in the upper, middle and lower turnouts to whom the "the farmers' satisfaction" questionnaires will be distributed and (3) Government staff to be targeted by the "WUA Performance Satisfaction" questionnaire
  - ✓ Discuss the proposed schedule for field measurements **based on the water rotation (days and times during which water will be distributed to the selected lines)**
  - ✓ Arrange for the provision of **technical assistance from the regional office and logistic support for the field measurements** (including mobilisation of measuring devices and tools), taking into account the staff availability.

- **Always follow the "application of procedures in the field" with "on-job training for the WUA staff"** to get trained on how to fill related data collection forms, and how to enter and manually process the measurements' data. This will lead to further refinement of the procedures and the related documentation based on the local conditions.

Specific considerations at the Regional Level

- **Introduce the designated MONEVA regional officer(s)** with the envisaged work and define his/her scope of work (See Annex 1)

- **Conduct On-job trainings for the staff of the regional office(s) on the procedures**, with the participation of other national and regional officers. This normally leads to the refinement of procedures to better suit the conditions in the country.

4.4.2.3.2 Summary of Procedures developed by SWIM-SM

In Jordan eight new procedures (addressing a total of 14 data variables) at the local level were developed, and two existing procedures (addressing some ten data variables) were refined. In Tunisia, Ten new procedures (including intermediate tables for daily and monthly data) were developed ….. ….. At the regional level, a total of 10 procedures were introduced addressing some 20 variables (Jordan only)

Below is a summary of the procedures developed by SWIM-SM:

At the local level:

1. Procedures for measuring flows and pressure at the upper and lower turnouts. Such procedures are necessary to enable evaluation of the equitability of distribution of irrigation water within the area serviced by the WUA (Jordan and Tunisia). Some adjustments have been introduced to the procedures in the case of Tunisia given the time and human resources required for the measurements and the losses in water that have been recorded.
2. Procedures to carry out surveys to measure the degree of farmers' satisfacation with the WUA services and performance with respect to the uniformity of the flow & pressure, the operation and maintenance of the pressurised system (Jordan and Tunisia), to enter the data and process them according to the MONEVA requirements
3. Same as above but for surveys to measure the degree of satisfaction of the government staff with respect to the WUA performance (Jordan and Tunisia)
4. Procedures that introduces all the elements of the costs that should be included when determining the annual costs of the WUAs including "personnel costs", "maintenance costs" "direct maintenance costs" and "costs of repairs due to illegal use" to enable improved documentation of such costs (Jordan and Tunisia), being essential to ensure the financial viability of the WUA. The procedures include data log forms on a daily basis, and processing of such data on a daily and monthly basis to obtain annual costs.
5. Procedures to collect, and process on-farm data in order to assess the impact of the WUAs establishment on crops productivity, crop diversification, level of investment in on-farm technology, agricultural production, etc. (Jordan and Tunisia)

At the regional level:

1. Assessing the degree of effectiveness of coordination among the institutions participating in PIM/IMT program in a region. The procedure is based on collecting the opinions of selected regional officers about the effectiveness of the coordination among the participating institutions.

2. Estimating the annual amount of money allocated by the irrigation agency and cooperating institutions (including donors) for the planning and implementation of the PIM/IMT during last year in the region. This procedure requires the determination of two variables: one is the annual amount of salaries allocated by the irrigation agency and the other is annual amount of money allocated by the donors for the planning and implementation of the PIM/IMT during last year.

3. Assessing the annual financial allocation provided last year for the rehabilitation and/or improvement of the irrigation systems to be handed over to the WUAs of one region.

4. Assessing the number of staff working in the Irrigation Agency and of the staff in the regional office fully dedicated to the O&M of the irrigation system during last year and at the starting date of the PIM/IMT.

5. Assessing the number of training days for the staff of the WUA support unit at the regional office during last year and also for the leaders of the WUAs and staff including the number of courses in which they have participated.

6. Checking the number of accounting systems that were installed (and planned to be installed) in the WUAs of the concerned regional office.

7. Assessing the number of WUAs, where the evaluation of the rehabilitation needs has been carried out up to last year and the number of WUAs where the rehabilitation works were planned to be completed last year and the number of those actually completed last year in one region

The above procedures are documented in Annex 7 of this document (presented as a separate Word Document) based on their application at the regional level in Jordan[5]. The **respective procedures for the local level are detailed in Annex 8. Both annexes complement the "MONEVA data processing File (Excel File) at the regional and local levels (respectively; 'MONEVA Data Processing (Regional Level).xls' and 'MONEVA Data Processing (Local Level).xls' referred to above (available at www.swim-h2020.eu)**.

Being similar in structure, a brief overview of the two annexes will follow.

Both sets of "Procedures" set out in Annexes 7 and 8 are structured in a consistent manner for all the MONEVA variables analysed and cover the following:

1. **The "Process" table**. It describes the main characteristics of the procedure and provides guidance with respect to the methodology to be used for "data collection"/"measurements", the data to be collected and some other descriptive aspects of the process.
2. **Tasks table.** It provides the sequence of the tasks to be undertaken, when and by whom. The last 2-3 rows of the table provide guidance regarding the forms to be used and where to find them in the Annex.
3. **Examples of the forms to be used**. In the most general case three forms are needed, namely:
   a. ***Data collection forms***, which are necessary to collect the information in the field. A typical example of such forms is the questionnaires to be used to collect the views of the farmers regarding their degree of satisfaction with respect to some activities of the WUA (maintenance, operation, etc.). An example of such a form is presented with sample data to clarify how they must be filled by the users (See Table 7 below)
   b. ***Data entry and data processing forms*****:** Sometimes the data collected (such as the individual responses of the farmers with respect to the WUA performance) have to be entered first into **data entry forms** (See Table 8 for an example). The data collection forms were especially designed to allow grouping of the responses at any desired level. For example in the case of Table 8, grouping of the farmers' responses was made at five levels: "the Number of farmers, who were highly satisfied, satisfied, neutral, dissatisfied and highly dissatisfied with the WUA performance").

   In other cases, data can be entered directly into the "data collection form" for further processing (See Table 9 for an example).

   Both Annexes provide examples on such forms which are illustrated with some fictitious data for better understanding of the process. In this regard, the user has two possibilities after data is collected (entered): either to process them manually and directly enter the results into the MONEVA system, or to enter the collected data in the "MONEVA Data Processing" files (at the local or regional levels), where the same forms are included in the sheet "Processing", but with the facility that the required calculations are done automatically in Excel.

[5] For the procedures applied in Tunisia at the local level, please refer to Table 4 to get the names of the files as they appear on the website www.swim-h2020.eu

Table 7: Example of the data collection form to survey the degree of Farmers' Satisfaction of the WUA services and performance - related to Variables: C04061, C04062, C05060, C05070 and C07070

WUA Name		WUA Code		Date	

Location of the farm unit (Please enter Yes against the appropriate answer)	Lower turnout?	Upper turnout?	Middle turnout?
		Yes	

Indicator	Object of evaluation	Degree of satisfaction[6]				
		Highly Satisfied	Satisfied	Neutral	Not satisfied	Highly Dissatisfied
C04061	To what extent you are satisfied with the uniformity of the flow in the pressurized system?	Yes				
C04062	To what extent you are satisfied with the uniformity of the pressure?			Yes		
C05060	To what extent you are satisfied with the operation of the irrigation system?				Yes	
C05070	To what extent you are satisfied with the maintenance of the irrigation system?		Yes			
C07070[7]	To what extent you are satisfied with the performance of the WUA?					Yes

Source: Modified after Annex 8 "Procedures and Data Collection Forms for the MONEVA System at the Local Level"

Table 8: Example of the Data entry form to enter and summarise the results of the "Farmers Satisfaction Survey" related to Variables: C04061, C04062, C05060, C05070 and C07070 in the Pressurised System

Date of Survey	Farmer No.	Farm Unit Location (upper, lower, middle)	Degree of satisfaction with				
			The uniformity of the flow in the pressurised system?	The uniformity of the pressure?	The operation of the irrigation system?	The maintenance of the irrigation system?	The WUA performance[8]
31/12/2014	1	Upper	5[9]	3	2	4	1
31/12/2014	2	Upper	3	3	3	3	3
31/12/2014	3	Upper	1	1	1	1	1
31/12/2014	4	Lower	4	4	4	4	4
31/12/2014	5	Upper	2	2	2	2	2
31/12/2014	40						
No. of farmers who are highly satisfied				**0**	**0**	**0**	**0**
No. of farmers who are satisfied				**8**	**8**	**16**	**8**
No. of farmers who are neutral				**16**	**8**	**8**	**8**
No. of farmers who are not satisfied				**8**	**16**	**8**	**8**

[6] Enter YES under the answer that represents most your degree of satisfaction of the respective WUA service area
[7] To be included in the survey every three years
[8] To be collected every three years
[9] 5 = Highly Satisfied, 4 = Satisfied, 3 = Neutral, 2 = Not Satisfied, 1 = Highly Dissatisfied

No. of farmers who are highly dissatisfied	**8**	**8**	**8**	**16**
Total No. of farmers surveyed	40			

Source: Modified after Annex 8 "Procedures and Data Collection Forms for the MONEVA System at the Local Level"

Table 9: Example of Data collection and processing form for Variable C04041: Average flow at the lower turnouts in pressurised irrigation systems

WUA Name		**WUA Code**		**Year**
Name of lateral selected	Lateral 1	Lateral 2	Lateral 3	Add more laterals if necessary
Number of turnout	21	23	17	
Date of measurement No 1	30/09/2015	30/09/2015	30/09/2015	
Date of measurement No 2	30/10/2015	30/10/2015	30/10/2015	
Date of measurement No 3	30/11/2015	30/11/2015	30/11/2015	
Time of measurement No. 1	13:30	13:30	13:30	
Time of measurement No. 2	13:30	13:30	13:30	
Time of measurement No. 3	13:30	13:30	13:30	
Flow measurement No. 1 (l/s)	12	8.5	10	
Flow measurement No. 2 (l/s)	13	9	8	
Flow measurement No. 3 (l/s)	10	10	7	
Average flow per lower turnout in each lateral (l/s)	**11.67**	**9.17**	**8.33**	
C04041: Average flow for the selected lower turnouts (l/s)			**9.72**	

Source: Modified after Annex 8 "Procedures and Data Collection Forms for the MONEVA System at the Local Level"

4. **The full set of data collection forms**. These are presented in a dedicated appendix at the end of both Annexes (in Appendix 1 of Annexes 7 and 8). Here, the same forms that were described in the examples are included without any data and ready for use in the field once printed and distributed.

   The "Procedures and data collection forms" of Annex 7 and Annex 8 do not only provide understanding on how to undertake some calculations, but also provides a set of standard forms for the collection of data at the field and standardises the data collection procedure. If the instructions are followed, there is the guarantee that the data would be comparable and consistent, being collected with the same methodology. Table 9 above illustrates one of the forms used for determining the average flow at the lower turnouts in pressurized pipes with illustrative data entered. The text of the "Procedures and data collection forms" of Annex 8 further explains how to select the laterals and how and when to undertake the measurements. As the example illustrates, the calculation involved are very simple but some of the field staff may need this guidance.

Once the variable is calculated as per Table 9 above, the computed value (9.72 l/s) should be inputted in the MONEVA system. Likewise, the corresponding flow in the upper turnouts (for which the text in the "Procedures and data collection forms" of Annex 8 also details how to measure it) should be also inputted into the MONEVA. Then, the MONEVA system will calculate an indicator that reflects the equality of the water distribution within the irrigation system. Depending on the scoring criteria assigned to this indicator, the WUA will get 2, 1 or 0 points for the resulting value in the evaluation for this specific indicator.

As indicated above**, all the forms mentioned above (but without values) are also included in the "processing sheet" of the "MONEVA data processing.Xls", corresponding to the level under consideration[10] but without any detailed explanations**. Once the user is familiar with the procedures he/she can go directly to the "processing sheet" and enter the information there. In this regard, the procedures provide an initial support that may not be needed after the user gets familiar with them, or they may be only sporadically consulted. However, in WUAs where no computer is available the procedures may remain an essential tool to undertake the calculations in a more traditional fashion.

[10] i.e. either in the "MONEVA data processing (Local level).xls" or in the "MONEVA data processing (Regional Level).xls"

For more information on these procedures, the reader may refer to the more detailed explanations set out in the above mentioned Annexes (Annex 7 & Annex 8) in order to understand which data will be collected, the methodology for data collection, when should the measurements be taken or data be collected, where it will be entered and how it will be processed.

4.4.3 Step by Step Guide for the Regional Level Users to enter the Monitoring Information into the "MONEVA" System

4.4.3.1 Objective

The section is intended to assist the designated **MONEVA Regional Officers** who are responsible for filling the information required by the MONEVA system at their level. For this purpose users will be guided in a step by step modality through the different instruments of support that have been developed to facilitate the entry of data into the MONEVA system.

4.4.3.2 Assumptions

1. This guide is addressed to the person (or persons) designated by the Director of the concerned Regional Office to collect and enter the monitoring data in the MONEVA system.
2. The guide assumes that the MONEVA settings including those related to PIM/IMT dates are retrieved by the MONEVA Regional Officer
3. The guide covers **only** entering of data in the **Monitoring menu of MONEVA**. For other menus of MONEVA the user should follow the User's guide included in the MONEVA system
4. The user has copies of the following **elements of support**:
   a. **MONEVA data processing (Regional Level).xls**
   b. **Procedures and data collection forms (Regional Level).pdf (Annex 7)**
5. The user has some familiarity with the use of the MONEVA system and its purpose

4.4.3.3 Background

Previous experience has shown that entering the information directly in the MONEVA forms above mentioned, might present some difficulties particularly for the numerical data to be entered. To facilitate the collection and processing of this numerical data two elements of support were developed, namely: the Excel file called "**MONEVA data processing (Regional level)**" and "**Annex 7** related to the Procedures and data collection forms (regional level)".

The recommended procedure of this guide is largely based on the use of the above-mentioned **elements of support**. The use of these instruments has several advantages: facilitating the calculations, guaranteeing uniformity in the collection of information and its processing and facilitating the storing of information, since one copy of the information entered remains always in the Regional Office and can be easily updated in future years. Once all the calculations completed according to the procedures, the data can be entered in the "Monitoring" Menu of the MONEVA.

4.4.3.4 Recommended procedure

Step 1. Copy the Excel file called "**MONEVA data processing (Regional Level)**" into your computer under the local Disk C:\Moneva Processing\.

Step 2: Make a copy of the above file, and rename the copy to reflect the year for which the monitoring data is entered. For example, if you are entering the data for the year 2014, the new file name will be "**MONEVA data processing (Regional Level)_2014. In 2015, a new copy will be made for that year.**

Step 3: Open the file "**MONEVA data processing (Regional Level)" for the year under consideration** and select the spreadsheet called ***"RegionsFixed Info".*** See if the data related to your Region is correct and complete missing information, **while noting the legend which distinguishes between the different types of data entry such as**:

- Data/Information filled once at the beginning of monitoring and evaluation applicable for the country level
- Data/Information filled once at the beginning of monitoring and evaluation (relevant to the regional office under consideration)
- Formula(not to be touched)
- Direct data entry (to be updated annually)
- Information is entered using a list from a Drop down menu.

Note: *Make sure you enter the information available at the top left end of this sheet, as they form the basis for a lot of calculations within the file (See Figure 7 below). Also note the legend.*

Figure 7: Example of Information that has to be filled by the MONEVA Regional Officer

تاريخ المباشرة ببرنامج ال PIM/IMT **Year PIM/IMT started**	2002	تعبأ مرة واحدة عند المباشرة باستخدام هذا الملف وهي ثابتة على المستوى الوطني To be filled once at the beginning when this file is used for the first time. It is a fixed value at the National level
سنة المباشرة باستخدام تطبيق نظام الرصد والتقييم (تاريخ بدء إدخال بيانات الرصد/المتابعة لأول مرة) **M&E Start Year**	2014	تعبأ مرة واحدة عند المباشرة باستخدام هذا الملف وهي متغيرة وتعتمد على سنة مباشرة المكتب الأقليمي بتطبيق نظام الرصد والتقييم To be filled once at the beginning when this file is used for the first time and it changes depending on the M&E start date of the regional office under consideration
السنة المرجعية (والتي يتم جمع البيانات وصولا اليها) **Reference Year up to which data will be accumulated**	2013	Formula - معادلة
سنة إنشاء وحدة دعم جمعيات مستخدمي المياه **WUA Support unit establishment year**	2010	تعبأ مرة واحدة عند المباشرة باستخدام هذا الملف وهي ثابتة على المستوى الوطني To be filled once at the beginning when this file is used for the first time. It is a fixed value at the National level
السنة التي يتم إدخال بيانات الرصد والتقييم لها **Year for which M&E data is entered**	2014	تغير السنة في هذه الخانة سنويا وهي تمثل العام الذي يتم جمع بيانات الرصد/المتابعة المتعلقة به Year to be changed annually. It represents the year for which Monitoring data are collected
المديرية/المنطقة **Region/Directorate**	مديرية الشونة الجنوبية South Shuneh Directorate	يرجى إدخال اسم المديرية الخاصة بكم من القائمة المحددة مسبقا Enter your regional office name using the drop menu
المنطقة الرئيسية **Main Region**	شمال وادي الأردن North Valley	Formula - معادلة

Step 4. Select the sheet called *"**CountryMaster tables**"*. These are tables for national use. Check if the data related to your Region are correct and complete. If not, complete with the missing information **while noting the legend.**

Step 5. Select and open the sheet called **"12&36Months*Processing*"**. The first variable is the A02020R (referring to the "Degree of effectiveness of coordination among the institutions participating in PIM/IMT program in your region"). This variable requires some guidance for filling the data needed. Go to step 6 for this guidance.

Step 6. Go to the printed document of **Annex 7**, corresponding to the "**Procedures and data collection forms (regional level)"** and follow closely the instructions for the data collection and processing of the variable under consideration.

Step 7. After the survey is carried out and recorded in the data collection form, enter the obtained values in the "**12&36MonthsProcessing"** sheet. The final result is automatically copied in the **"input2MONEVA"** sheet.

Stept 8. Repeat the steps 5, 6 and 7 for all the remaining variables specified in the "**12&36MonthsProcessing"** sheet.

Step 9. Select and open the sheet called "***CumulativeDataProcessing***". The data in this sheet corresponds to the monitoring data that needs to be entered "once at M&E start" in the MONEVA system (See also Figure 2**).** It contains a number of variables that need intermediate calculations. Examples have been provided for the South Shuneh Directorate to illustrate the type of data and calculations that are needed. Users of other regions should clear the data highlighted in blue and replace it with the ones of their specific region or directorate. **A legend is provided in this sheet to guide the user as to what needs to be entered directly (highlighted in blue) or through selection using predefined drop menu (highlighted in green)**.

Step 10. Select and open the sheet called **"input2MONEVA"** and check that all the calculations done in the processing sheet were automatically transferred to this sheet in the column "F". Enter the remaining values corresponding to the variables that require direct data entry (i.e. no processing is needed) into the empty cells of the same column "highlighted in blue".

Step 11. Open the MONEVA system and go to the Monitoring menu. Click on the button: "Regional (once at the ME start); (See the top box of the submenu in the left side of **Figure 4**). Select the Regional office and the year for which you want to enter the information. Copy one by one the values of the variables that are found in Column F of the "**Input2MONEVA"sheet which** have the frequency equals to "888" into the corresponding codes of the MONEVA screen. Make sure that the codes in the sheet "Input2MONEVA" correspond with those of the Monitoring menu of MONEVA.

In order to facilitate screening of the variables according to their frequency, the user of the "**MONEVA data processing (Regional Level)"** can select only the variables (listed in the **"Input2MONEVA"** sheet) corresponding to the frequency equalling "888". This frequency "i.e. 888" corresponds to the monitoring data to be entered "once at the M&E start" (**refer back to** Figure 2**)**. The selection can be done by going to column B2 of the **"Input2MONEVA"** sheet, clicking on the combo box on the lower right end of the cell, and then select the frequency which equals "888". Then all the variables that need to be entered into "Regional (once at the ME start)"monitoring, will be filtered in the **Input2MONEVA"** sheet from where their values can be copied into the corresponding fields in the MONEVA menu.

Step 12. **Go back to the Monitoring menu.** Click on the button: "Regional (12 months step starting Reference year)". Select the Regional office and the year for which you want to enter the information. Copy one by one the values of the variables that are found in Column F of the "**Input2MONEVA"sheet which** have the frequency equals to "12" into the corresponding codes of the MONEVA screen. Make sure that the codes in the sheet "Input2MONEVA" correspond with those of the Monitoring menu of MONEVA.

In order to facilitate screening the variables according to their frequency, the user of the "**MONEVA data processing (Regional Level)"** can select the codes listed in the **"Input2MONEVA"** sheet corresponding to the frequency equalling "12". This frequency "i.e. 12" corresponds to the monitoring data to be updated "every 12 months" (**refer back to** Figure 2**)**. The selection can be done by going to column B2 of the **"Input2MONEVA"** sheet, clicking on the combo box on the lower right end of the cell, and then select the frequency which equals "12". Then all the variables that need to be entered into "Regional (12 months step starting Reference year)", will be filtered in the **Input2MONEVA"** sheet from where their values can be copied into the corresponding fields in the MONEVA menu.

Step 13. **Go back to the Monitoring menu.** Click on the button: "Regional (36 months step starting Reference year)". Select the Regional office and the year for which you want to enter the information. Copy one by one the values of the variables that are found in Column F of the "**Input2MONEVA"sheet which** have the frequency equals to "36" into the corresponding codes of the MONEVA screen. Make sure that the codes in the sheet "Input2MONEVA" correspond with those of the Monitoring menu of MONEVA.

In order to facilitate screening the variables according to their frequency, the user of the "**MONEVA data processing (Regional Level)"** can select the codes listed in the **"Input2MONEVA"** sheet corresponding to the frequency equalling "36". This frequency "i.e. 36" corresponds to the monitoring data to be updated "every 36 months" (**refer back to** Figure 2**)**. The selection can be done by going to column B2 of the **"Input2MONEVA"** sheet, clicking on the combo box on the lower right end of the cell, and then select the frequency which equals "36". Then all the variables that need to be entered into "Regional (36 months step starting Reference year)", will be filtered in the **Input2MONEVA"** sheet from where their values can be copied into the corresponding fields in the MONEVA menu.

For other countries in the region which are willing to deploy the system: Review the sheets and adjust them to your national and regional conditions

4.4.4 Step by Step Guide for the Local Level Users (WUAs) to enter the Monitoring Information into the "MONEVA" System

4.4.4.1 Objective

The section is intended to assist the designated **MONEVA Local Officers** who are responsible for filling the information required by the MONEVA system. For this purpose users will be guided in a step by step modality through the different instruments of support that have been developed to facilitate entering the data into the MONEVA system.

4.4.4.2 Assumptions

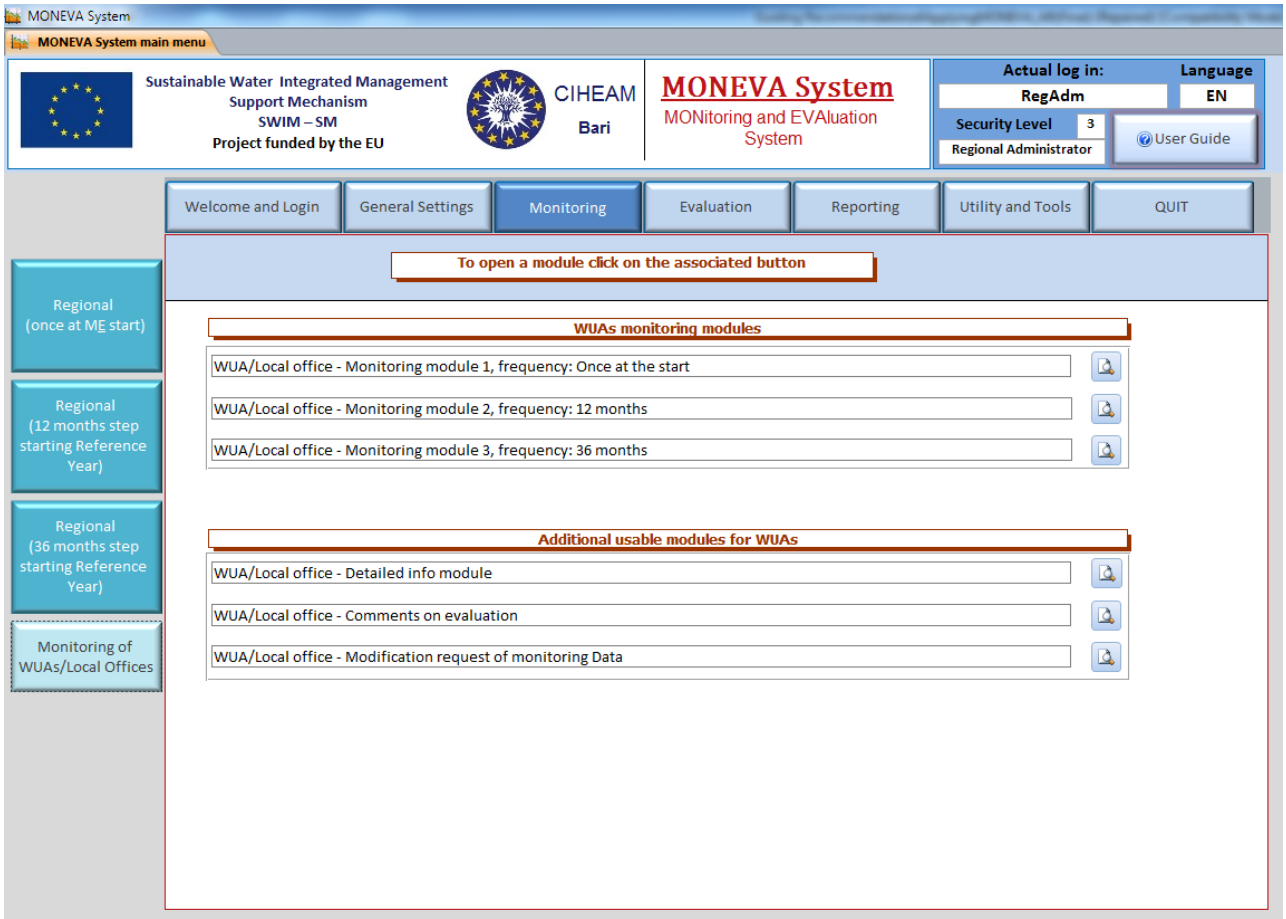
1. This guide is addressed to the person (or persons) designated by the President of the WUA to collect and enter the data in the MONEVA system.
2. The user has received from the Regional Office the PDF files (modules) at the local level in the applicable language (that should reflect only the applicable[11] indicators at the local level), which include (Figure 8):
   a. WUA/Local office - **Monitoring module 1, frequency: Once at the start**
   b. WUA/Local office - **Monitoring module 2, frequency: 12 months**
   c. WUA/Local office - **Monitoring module 3, frequency: 36 months**
   d. WUA/Local office - **Detailed info module**
   e. WUA/Local office - **Comments on evaluation**
   f. WUA/Local office **- Modification request of monitoring Data**
3. The user has received from the MONEVA Regional Officer the following **elements of support** in the applicable language
   a. **MONEVA data processing (Local Level)** (Excel File)
   b. **Procedures and data collection forms (Local Level).pdf (Annex 8)**
4. **For Jordan only**: The user has received from the Water Management Information System (WMIS) section through the appropriate Regional Officer, the text files that contain all the WMIS data related to the variables/indicators; (C03023, C03024, C03041, C03052, C03071, C03081, C06122, C06131, C06151, C10011, D04021.1, and D04041.1, for the year under consideration. There is one text file for each of these variables/indicators, which is saved under

[11] See the note at the end of the section "Establishment of the MONEVA settings by the National Administrator"

the same code of and the year for which the monitoring is conducted. Example "C03023_2014.txt". **Other countries May consider developing a script to extract MONEVA-related data from existing information systems if applicable.**

5. The user has some familiarity with the use of the MONEVA system and its purpose.

Figure 8: Example of Information that has to be filled by the MONEVA Local Officer



4.4.4.3 Background

Previous experience has shown that entering the information directly in the MONEVA forms above mentioned, might present some difficulties particularly for the numerical data to be entered. To facilitate the collection and processing of this numerical data two elements of support were developed, namely: the Excel file called "**MONEVA data processing (Local level)**" and "**Annex 8** related to the Procedures and data collection forms (local level)".

The recommended procedure of this guide is largely based on the use of the above mentioned **elements of support**. The use of these instruments has several advantages: facilitating the calculations, guaranteeing uniformity in the collection of information and its processing and facilitating the storing of information, since one copy of the information entered remains always with the WUA and can be easily updated in future years. Once all the calculations are completed according to the procedures, the data can be entered into the MONEVA PDF forms (Modules) at the local level.

For WUAs not having a computer, printing the file "**MONEVA data processing (Local Level).xls**" will be of help but the automatic calculations inserted in this file will not be operative. **Annex 8** related to the "Procedures and data collection forms" at the local level will be also of great assistance but all calculations will have to be done manually. For these reasons WUAs in this situation are strongly advised to seek the

assistance of a person with a computer and ability for its use. A WUA not using computer facilities nowadays cannot keep good control of its operations.

4.4.4.4 Recommended procedure

Step 1. Copy the Excel file called "**MONEVA data processing (Local Level)**" into your computer under the local Disk C:\Moneva Processing\

Step 2: Make a copy of the above file, and rename the copy to reflect the year for which the monitoring data is entered. For example, if you are entering the data for the year 2014, the new file name will be "**MONEVA data processing (Local Level)_2014. In 2015, a new copy will be made for that year**

Step 3: Open the file **"MONEVA data processing (Local Level)" for the year under consideration** and select the sheet called ***"WUA fixed info"***. See if the data related to your Region is correct and complete missing information, **while noting the legend which distinguishes between the different types of data entry such as**:

- Data/Information filled once at the beginning of monitoring and evaluation
- Formula(not to be touched)
- Direct data entry (to be updated annually)
- Information is entered using a list from a Drop down menu.

Note: *Make sure you enter the information available at the top left end of this sheet, as they form the basis for a lot of calculations within the file (See Figure 9 below) including the crop water requirements calculations for the WUA under consideration.*

Figure 9: Example of Information that has to be filled by the MONEVA Local Officer

WUA name اسم الجمعية	غور كبد المضخة 91 Ghor KabedPump Station 91	يتم إدخال الاسم باستخدام قائمة محددة مسبقا Name is entered using a list from a
المديرية/المنطقة **Region/Directorate**	مديرية الشونة الجنوبية South Shuneh Directorate	Formula - معادلة
رمز الجمعية **WUA Code**	203003	Formula - معادلة
السنة التي يتم إدخال بيانات الرصد والتقييم لها **Year for which M&E data is entered**	2014	إدخال مباشر للمعلومات (يتم تحديثها سنويا) Direct data entry (to be updated (annually

Step 4. Open the sheet called ***"Processing"***. The first variable is the C04041 (referring to the "Average flow at the lower turnouts in pressurized systems") and it requires some guidance for the data collection and processing. Go to step 5 for this guidance.

Step 5. Go to the printed document of **Annex 8,** related to the "**Procedures and data collection forms (local level) "**and follow closely the instructions for the data collection and processing of the variable(s) under consideration.

Step 6. Enter the measurements obtained in the field (and supposedly recorded in the data collection form related to the variable C04041. See Form L.1, in Appendix 1 of Annex 8) into the **"Processing"** sheet. Once all the data are inputted, the result is automatically copied in the **"input2MONEVA"** sheet.

Step 7. Repeat the steps 4, 5 and 6 for all the remaining variables specified in the ***Processing*** sheet.

Step 8. Open the **"WaterNeeds" sheet** and make sure that the crop water requirements correspond to the region where the WUA is located. If this is not the case, then make sure you have entered the name of your WUA in the **"WUAFixedInfo"** sheet.

Step 9: Open the sheet called **"Input2MONEVA"** and check that all the calculations done in the "**Processing**" sheet were automatically transferred to this spreadsheet in the column "F". Enter the remaining values corresponding to the variables that require direct data entry (i.e. no processing is needed) into the empty cells of the same column "highlighted in blue".

Step 10. For Jordan only: While still in the "Input2MONEVA" sheet, execute the script that was developed under visual basic for all the following variables/indicators ((C03023, C03024, C03041, C03052, C03071, C03081, C06122, C06131, C06151, C10011, D04021.1, and D04041.1). This can be done by just clicking on each of these variables/indicators which will result in automatically summarising the data related to each of them (using the data stored in the text files mentioned in bullet 4 of section 4.4.4.2 above) in the required form as needed by the MONEVA, while saving the results in the "**WMIS Results"** sheet.

Step 11. Copy all the values of the variables that are found in Column F of the "**Input2MONEVA"sheet which** have the frequency equals to "888" into the corresponding codes in the PDF form " **WUA/Local office - Monitoring module 1, frequency: Once at the start"**. Check carefully that the value that you enter corresponds to the code stated in the PDF form (module) under consideration.

In order to facilitate screening of the variables according to their frequency, the user of the "**MONEVA data processing (Local Level)"** can select only the variables (listed in the **"Input2MONEVA"** sheet) corresponding to the frequency equalling "888". This frequency "i.e. 888" corresponds to the monitoring data to be entered "once at the M&E start" (**refer back to** Figure 2**)**. The selection can be done by going to column B2 of the **"Input2MONEVA"** sheet, clicking on the combo box on the lower right end of the cell, and then select the frequency which equals "888". Then all the variables that need to be entered into "WUA/Local office - **Monitoring module 1, frequency: Once at the start"**, will be filtered in the **Input2MONEVA"** sheet from where their values can be copied into the corresponding fields of the PDF module under consideration.

Step 12. Copy all the values of the variables that are found in Column F of the "**Input2MONEVA"sheet which** have the frequency equals to "12" into the corresponding codes in the PDF form **"WUA/Local office - Monitoring module 2, frequency: 12 months**". Check carefully that the value that you enter corresponds to the code stated in the PDF form (module) under consideration.

In order to facilitate screening of the variables according to their frequency, the user of the "**MONEVA data processing (Local Level)"** can select only the variables (listed in the **"Input2MONEVA"** sheet) corresponding to the frequency equalling "12". This frequency "i.e. 12" corresponds to the monitoring data to be entered "once every 12 months" (**refer back to** Figure 2**)**. The selection can be done by going to column B2 of the **"Input2MONEVA"** sheet, clicking on the combo box on the lower right end of the cell, and then select the frequency which equals "12". Then all the variables that need to be entered into "**WUA/Local office - Monitoring module 2, frequency: 12 months"**, will be filtered in the **Input2MONEVA"** sheet from where their values can be copied into the corresponding fields of the PDF module under consideration.

Step 13. Copy all the values of the variables that are found in Column F of the "**Input2MONEVA"sheet which** have the frequency equals to "36" into the corresponding codes in the PDF form **"WUA/Local office - Monitoring module 3, frequency: 36 months**". Check carefully that the value that you enter corresponds to the code stated in the PDF form (module) under consideration.

In order to facilitate screening of the variables according to their frequency, the user of the "**MONEVA data processing (Local Level)"** can select only the variables (listed in the **"Input2MONEVA"** sheet) corresponding

to the frequency equalling "36". This frequency "i.e. 36" corresponds to the monitoring data to be entered "once every 36 months" (**refer back to** Figure 2**)**. The selection can be done by going to column B2 of the **"Input2MONEVA"** sheet, clicking on the combo box on the lower right end of the cell, and then select the frequency which equals "36". Then all the variables that need to be entered into "**WUA/Local office - Monitoring module 3, frequency: 36 months"**, will be filtered in the **Input2MONEVA"** sheet from where their values can be copied into the corresponding fields of the PDF module under consideration.

Step 14. Complete the form: d) WUA/Local office - **Detailed info module.** The information regarding the main crops is only for descriptive purposes and not essential but the rest of the information is essential to keep an updated inventory of the WUAs.

Step 15. Send the four forms: a, b, c, and d to the regional office following the instructions given in the forms.

In case of errors in the information sent to the regional office or disagreement with the evaluation received from the regional office, follow steps 16 and 17.

Step 16. In case of disagreement with the evaluation received from the regional office for a specific indicator use the form: e) WUA/Local office - **Comments on evaluation** to record the WUA comments on the evaluation of the said indicator, and then send the form to the regional office about your disagreement

Step 17. In a case of error in the value of a variable already sent to the regional Office use the form: f) WUA/Local office **- Modification request of monitoring Data** to correct the data sent and then send the form to the regional office.

4.5 Evaluation

This is the most important part of the MONEVA system but, like in any other M&E system, its value is largely determined by the quality of the data entered. Evaluation is performed once the monitoring phase is completed. The system distinguishes between two levels: National and Regional administrators or users: each can perform only the Evaluation at their respective level and hence can access the corresponding outcomes

Figure 10: Selection of the outcomes to be evaluated

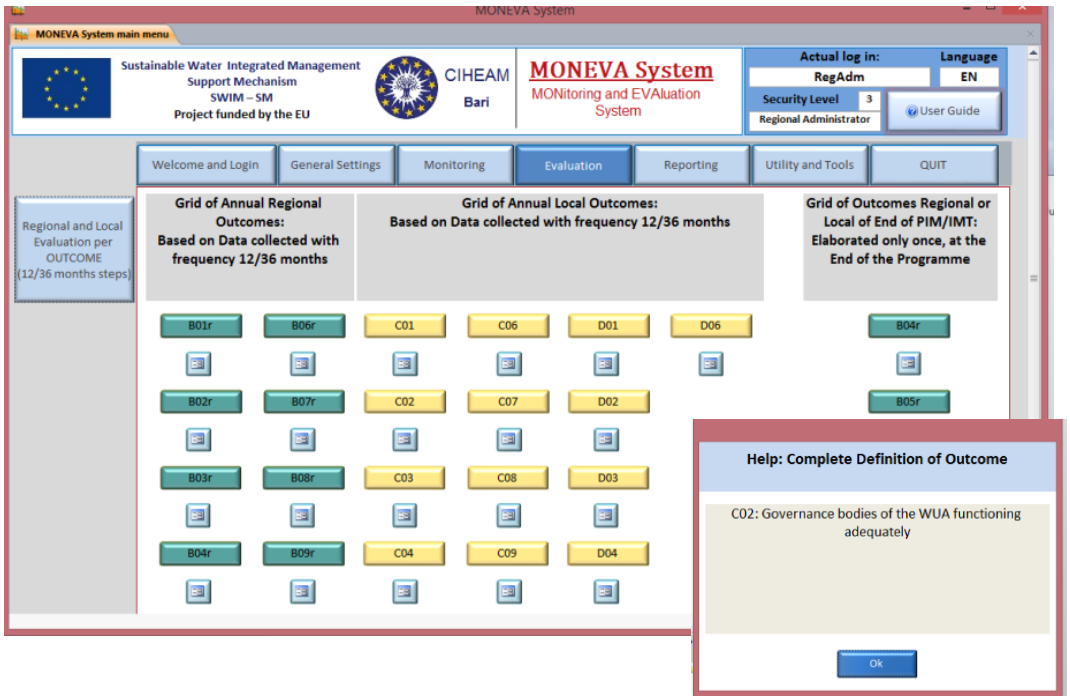


Figure 10 shows the screen at the Regional Level, where the outcomes can be selected. Those in green correspond to the **Regional level (represented by a code starting with B and ending with r, example B01r)** and those in yellow to **Local Level**. By clicking on any button, a description of the

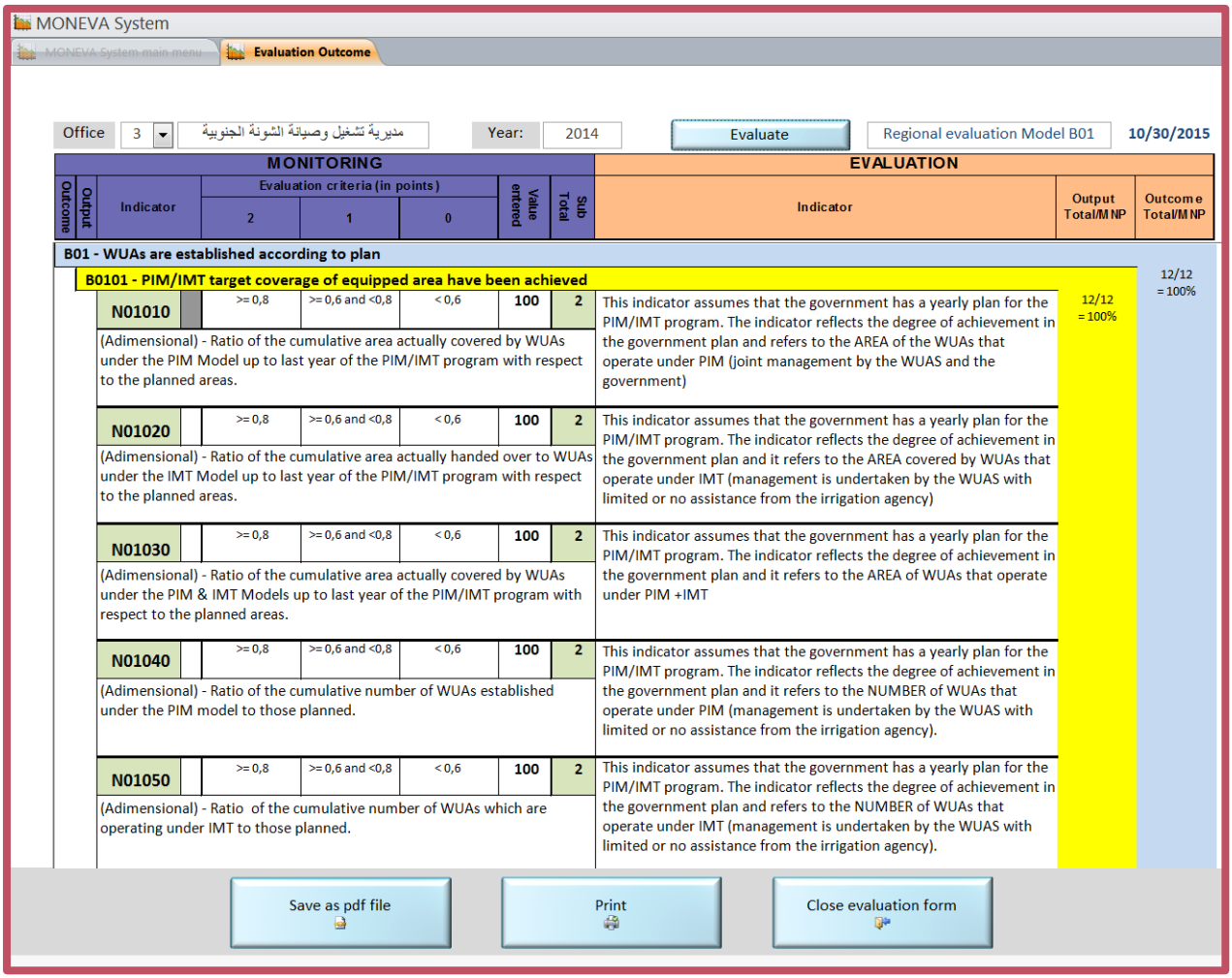
outcome appears as shown also in figure 10.

To have the complete evaluation at the national, regional or local level (WUAs), all the outcomes of that level must be evaluated. This can be performed in one single session or separate sessions.

Once an outcome is selected for evaluation, the screen that appears to the users is like the one shown in Figure 11, whereby the evaluation is made for all the indicators related to each output and for all the outputs related to each outcome. The number of points obtained for the output represents the total scores of the respective indicators and is reflected in the yellow part of the screen shot (depicted in

Figure 11), while the number of points obtained for each outcome (in blue), represents the total scores of all the outputs. The total number of points obtained with respect to the maximum possible indicates the level of achievement of outputs and outcomes. The number of points is only an approximation to the reality and the most important issue is whether the outputs and outcomes were achieved and, if not, why not. In the second level evaluation, that takes place in the presence of the concerned stakeholders, great attention must be dedicated to the reasons why certain outputs or outcomes were not achieved and the actions needed to correct the situation. This feature confers to MONEVA the characteristics of a DSS.

Figure 11: Screenshot illustrating the evaluation for outcome B01r[12]



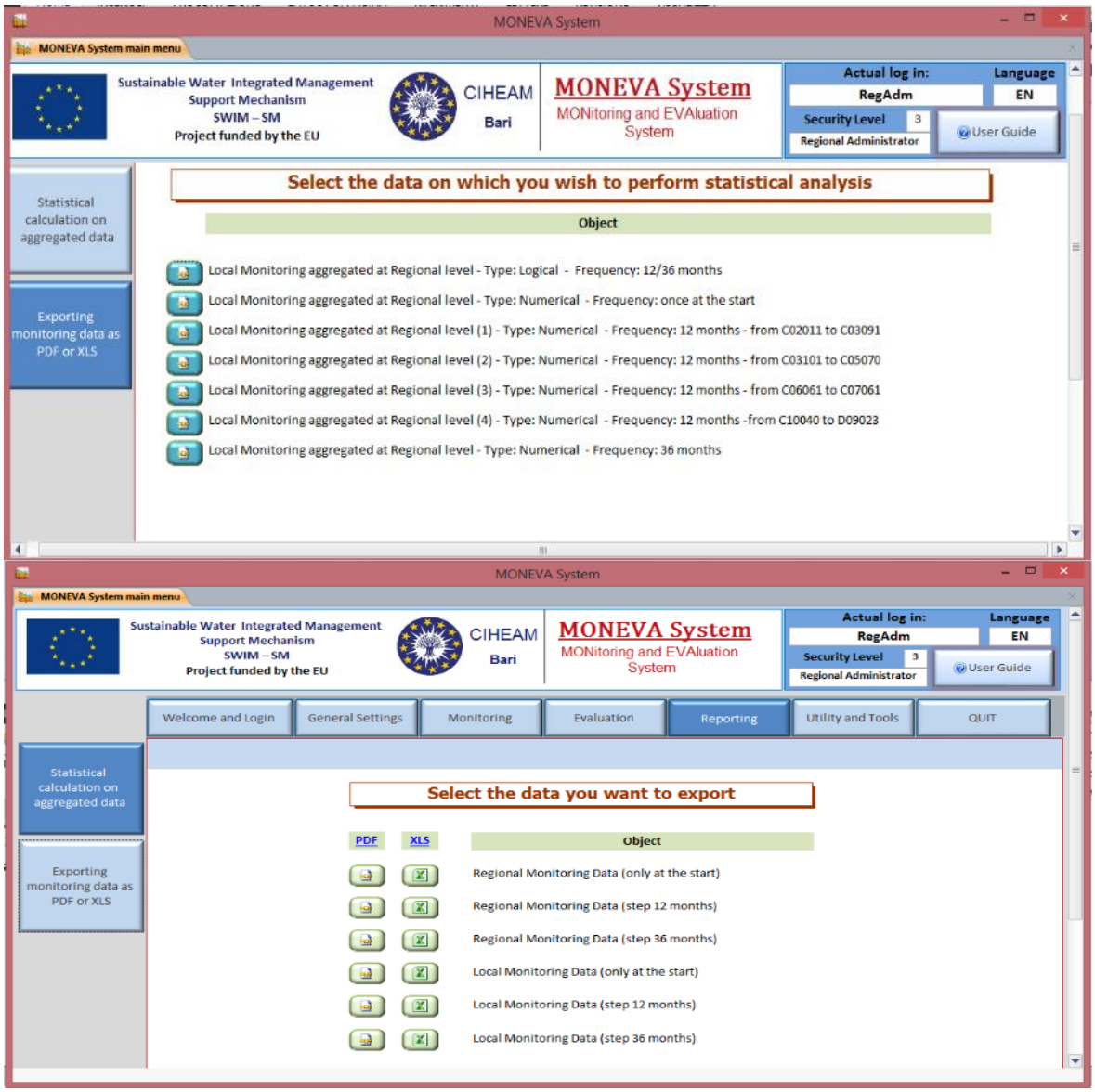
[12] "r" refers to the regional level

4.6 Reporting

This function provides two tools enabling the user to perform a more detailed evaluation of selected indicators. The two options are illustrated in Figure 12. The first option of the menu is the "Statistical calculation on aggregated data"; aggregating where it applies, Local monitoring data at Regional level. Statistics are performed on Numerical variables/indicators (Sum, Average, Minimum and Maximum) and on Logical indicators (Count).

The second option of the menu permits "Exporting Monitoring data as PDF or XLS"; making available, to a Regional Administrator and/or User, the bulk Regional and Local monitoring data of the database, organized per level and per frequency of update where all the aggregated data regarding a given indicator are included and the user can perform all kind of statistical analysis and preparation of related graphs.

Figure 12: First and second option of the reporting menu



5 A quick road map for the application of MONEVA in other countries

The road map of the main activities to be undertaken when initiating the application of MONEVA are given below. Given the fact that every PIM/IMT experience is different, the road map may need to be adapted to every specific situation but it represents a good guide of the steps that need to be considered.

1. **Government interest and support**. An essential element for the success of MONEVA in Jordan and Tunisia was the strong support received from the concerned government institutions who dedicated time and resources to support the implementation of the program. Without such interest and support, the application of MONEVA will be limited in scope and results.
2. **A progressive geographical approach.** The approach used in the pilot experiences of involving a limited number of regions and WUAs in the first year and expanding them progressively in the second year has proven to be highly adequate and will be also advisable in other countries to gain confidence with the system.
3. **Good planning of the activities to be done is required.** One or two days planning workshops to define the activities to be undertaken is a good start.
4. **Training of trainers (TOT) is an important pillar of the implementation.** The experience showed that a 3 days training workshops were sufficient to train the national/regional officers concerned and a limited number of WUA leaders. Use of local language (Arabic) proved to be fundamental. The training of the National/ administrator require some additional on job training.
5. **Local support to the leaders of the WUAs.** For many WUAs the use of computer facilities is often a new world and even when information to be provided is simple they often need support. In this sense, the PIM/IMT Support Units of Jordan and Tunisia proved to be essential to provide the needed support. Also, trained Regional Officers can play an important role in this task.
6. **Remote technical assistance from the developers.** The pilot experience showed that the requirements for technical assistance from the developers were very modest but it is important to count on such assistance if required.
7. **Financial and human resources.** Carrying the above activities implies the dedication of some human and financial resources to implement them. The human resources are generally available locally and the new activities require only additional time requirements for the training and some of the related activities. The financial resources would need to be evaluated in each case depending of the activities to be carried out. They are certainly modest considering that mainly local human resources are needed plus some limited external support from the developers. International or bilateral cooperating institutions may need to be approached if the financial resources are not available from other sources.

5.1 At the operational level

Based on the experience gained in the application of the system in the pilot countries during 2015, below is a summary of the steps needed in order to enable the successful application of the system in any pilot region of the country:

1. Select the pilot region in the country and the pilot WUAs
2. Nominate the MONEVA national administrator, and MONEVA focal points (in the pilot region, and the pilot WUAs) as per the scope of work available in Annex 1 and Annex 2; respectively.
3. Install the System (at the national and regional levels) making use of the system's guide, while noting the software and hardware requirements delineated therein for each level.
4. Get familiar with the system's structure (set of indicators, output, and outcomes), a task that should be undertaken by the designated national administrator.

5. Select the indicators applicable to the country, and the system's settings (using the system's guide), while making sure that all the MONEVA focal points and other relevant officials from the O&M departments, and those responsible for PIM/IMT are involved.
6. Disseminate the MONEVA settings to the pilot regional office (using the system's guide) – Responsibility of the MONEVA National Administrator
7. Disseminate the MONEVA PDF modules relevant to the local level to the WUAs – Responsibility of the MONEVA Regional Officer
8. Identify data required by the system and the available data (at the level under consideration).
9. Develop procedures for collecting unavailable data and refine existing ones, using whenever possible the procedures developed by SWIM-SM for the data not available in Jordan.
10. Integrate collection of new data to the extent possible with existing data collection forms and procedures
11. Test the procedures in the field at all levels and refine them to reflect the findings in the ground.
12. Review and customise the data processing files provided by SWIM-SM to suit the local conditions
13. Train the users on the system (each at his/her level (National, regional and local - as applicable)) and on the procedures. Seeking technical assistance from the developers would help in this regard.
14. Collect data at all levels (as applicable). This requires support from the national and regional officers to the WUAs implicated staff
15. Enter data into the MONEVA system and operate the system to obtain the evaluation results of PIM/IMT at the national and regional levels and the WUAs at the local level (the users' guide offer good help in this regard).
16. Conduct evaluation workshops involving all stakeholders from all levels, aiming at analysing the monitoring and evaluation results emanating from the operation of the MONEVA system, and at the development of action plans for the improvement of PIM/IMT process and of the WUAs performance based on the results of evaluation.
17. Review progress made in the action plan every year
18. Use the **evaluation results emanating from the MONEVA to guide the development of future actions** to improve PIM/IMT and WUAs performance. **Likewise**, these results should **become the main driver for any future intervention by donors in the field**.
19. Provide incentives for the utilisation of the system at the local level (possibly through inclusion in the transfer agreement)

Annex 1: Proposed Scope of work for the MONEVA officer at the regional level

a. Participate in PIM/IMT planning for the region
b. Implementation of the PIM/IMT plans/activities in the region
c. Documentation of the data and the activities during the year; as required by the MONEVA system
d. Data collection (including from donors and human resources department) using the procedures developed by SWIM-SM at the regional level; whenever applicable.
e. Processing of data using the processing files developed by SWIM-SM
f. Entry of the data related to the regional office into the MONEVA system
g. PIM/IMT evaluation in the region and sending the results to the WUA administration
h. Jointly develop the yearly action plan with the officers of the National level and the WUAs in his/her region.
i. Provide assistance to the WUAs during the establishment/operationalisation of the WUA in his/her region
j. Assisting the WUAs in the implementation of the procedures developed by SWIM-SM and in documentation of data and archiving
k. Assisting the WUAs in the application of the MONEVA
l. Participate in the development of the yearly action plan with the WUAs in his/her region
m. Follow up the implementation of the action plans in the WUAs of his/her region
n. Ensuring that the cropping pattern data is sent to the JVA control centre
o. Ensure that JVA control centre provides the WMIS data needed by the MONEVA following its validation.

Annex 2: Proposed Scope of work for the MONEVA officer at the local level

a. Coordinate the collection of information from the relevant WUA staff (Financial officer, Treasurer/WUA president, Field staff according to actual responsibilities designated to the respective staff

b. Provide technical assistance to the field staff

c. Ensure that the responsible staff - designated to collect the data, collect them in a timely manner and use the data collection forms (Distributed by SWIM-SM to the associations)

d. Pre-process the data using pre-processing Excel files developed by SWIM-SM for this purpose

e. Enter the data into the PDF modules

f. Send the filled PDF modules to the concerned Directorate (Regional Office) in order to evaluate the data entered into PDF

g. Receive the evaluation results of the monitoring data from the directorate concerned and coordinate - in cooperation with the President of the WUA - the organization of the discussions of the evaluation results and the preparation of next year(s) action plan with the relevant staff from the WUA support Administration

Annex 3: Numerical variables and indicators at the Regional level - classified by business category

No	Administrative	Farmers' Awareness	Coordination (internal or external)	Financial	Human Resources	Rehabilitation	Socio economy	training support staff	Training WUAs	WUAs Establishment & Management transfer
1	B05061	B02041	A02020R	A03021R	A03041R	B09051	D09012	B03031R	B04031	B01011
2		B02042	B05051	A03021R.1	A05081R	B09053		B03032R	B04032	B01012
3		B02061	B05052	A03021R.2	B03021R				B04041	B01021
4		B02062		A03031R					B04051	B01022
5				A03031R.1					B04052	B01041
6				A03031R.2					B05031	B01042
7				A03051R					B05032	B01051
8				A03061					B05041	B01052
9				A05091R					B08031	B06031
10				B03041R					B08032	B06032
11				D07010					B09021	B06041
12				D09011					B09041	B06042
13									B09042	

Annex 4: Numerical variables and indicators at the local level - classified by business category

No	Technical	Qualitative	Financial and administrative	Human Resources	Water productivity	Environment	Socio-economic
1	**C03021**	**C04061**	**C05081**	**C07031**	**D04021**	**D05011**	**D09012**
2	C03021.1	**C04062**	**C05082**	**C07061**	D04021.1	**D06020**	**D09013**
3	**C03023**	**C05070**	**C06052**	**D09012**	*D04021.1.1*		
4	**C03024**	**C07070**	C06052.1	**D09013**	*D04021.1.2*		
5	**C03041**	**C07080**	**C06091**		*D04021.1.3*		
6	**C03052**		**C06092**		*D04021.1.4*		
7	**C03071**		C06092.1		*D04021.1.5*		
8	**C03072**	**C05060**	**C06051**		D04021.2		
9	**C03081**		**C06101**		*D04021.2.1*		
10	**C03101**		**C06102**		*D04021.2.2*		
11	**C03102**		C0102.1		*D04021.2.3*		
12	**C03072**				*D04021.2.4*		
13	**C03103**		**C06111**		*D04021.2.5*		
14	**C03104**		**C06112**		**D04022**		
15	**C04011**		**C06121**		D04022.1		
16	**C04012**		**C06122**		*D04022.1.1*		
17	**C04041**		**C06131**		*D04022.1.2*		
18	C0401.1		**C06151**		*D04022.1.3*		
19	C0401.2		**C08021**		*D04022.1.4*		
20	C0401.3		**C08052**		*D04022.1.5*		
21	C0401.4		**C08011**		**D04041**		
22	**C04042**				D04041.1		
23	C0402.1						
24	C0402.2						
25	**C04051**						
26	**C04052**						
27	**C08041**						
28	**C10011**						

Annex 5: List of Logical Indicators at the regional level

A02010R	A coordination mechanism has been established at the regional level.
A02030R	Roles and responsibilities of the actors involved at the regional level are clearly defined with respect to PIM/IMT.
B04010R	Training needs assessment for the WUAs leaders and staff is available at regional level.
B04020R	Training material is available at the region.
B04060R	WUAs Training events were evaluated at the regional level.
B05020R	Training Manual for the accounting system to be used is prepared.
B05070	Financial accounts of WUAs are periodically audited by independent government staff.
B08020R	A users' manual of the M&E system is available at the regional level.
B08040R	Annual M&E report is integrated into the annual work plan of the WUAs at the regional level.
B09030R	WUAs representatives participate in identifying relevant rehabilitation requirements at the regional level.

Annex 6: List of Logical Indicators at the local level

C01010	Statutes of the WUA are available. .
C01011	The transfer agreement has been signed. .
C02070	WUA Auditing /Monitoring Committee is established. .
C02080	Annual auditing/ monitoring Committee report (for the previous year) approved by the General Assembly Meeting.
C02090	Annual financial report (for the previous year) is approved by the General Assembly.
C02100	Annual "financial and work plan" approved by the general assembly.
C02110	Committee/mechanism for conflict resolution and internal communication established.
C02120	Annual Communication and conflict resolution report for the previous year approved by General Assembly.
C03010	The planned water allocation (expressed in m3/ha) to be provided for the WUA, is announced at the beginning of the season by the Irrigation Agency
C05010	Prepared operation guidelines are in use.
C05020	Prepared maintenance guidelines are in use.
C05030	Annual maintenance plan is prepared each year.
C05040	Annual Operation Plan is prepared each year.
C05050	Concerned staff has been trained in the use of the O&M guidelines during the last five years.
C06010	A WUA system for record keeping and retrieval is in place.
C06020	The financial system is operational.
C06030	Guidelines for budget preparation are available.
C06040	Guidelines for cost accounting, auditing and budgetary control are available.
C07010	The manual of the WUA organization and functions is available.
C07020	A recruitment policy is available.
C07040	A communication system with water users is in use.
C07050	WUA organizes training sessions for farmers
C09010	The WUA has its own M&E system.
C09021	The relevant staff of the WUA has been adequately trained to use the M&E system
C09022	The relevant M&E results to be reported to the Irrigation Agency are identified
C09023	The relevant M&E results are reported to the Irrigation agency
C09024	The WUA produces an annual report with the analysis of the performance of the WUA and the annual results of the indicators of the M&E system
D06010	The WUA is taking initiatives to remove contaminating materials such as: used plastics of green houses, pesticides packages etc…)

Annex 7: Procedures and Data Collection Forms For the MONEVA System at the Regional level (Example of South Shuneh Directorate – Jordan)

Due to the importance of this Annex, it is presented as a separate document and can be downloaded from www.swim-h2020.eu. It should be printed and disseminated to the MONEVA National and Regional Officers to assist them in the data collection (for monitoring purposes of PIM/IMT) and processing (for the preparation of the data for entry into the MONEVA system at the regional level).

Please refer to the following document on the above mentioned site:

See "Guiding Recommendations4ApplyingMONEVA-Annex7(ProceduresRegionalLevel).pdf"

Annex 8: Procedures and Data Collection Forms for the MONEVA System at the Local level (Example of the South Shuneh Water Users Associations - Jordan)

Due to the importance of this Annex, it is presented as a separate document and can be downloaded from www.swim-h2020.eu. It should be printed and disseminated to the MONEVA local Officers to assist them in the data collection (for monitoring purposes of the WUA performance) and processing (for the preparation of the monitoring data for entry into the PDF modules at the local level).

Please refer to the following document on the above mentioned site:

"Guiding Recommendations4ApplyingMONEVA-Annex8(ProceduresLocalLevel).pdf"