Technical Note and Agenda

Regional Training Workshop on Enhancing Water Use Efficiency in Small Scale Irrigation
-The Application of FAO's MASSCOTE Approach
Strengthening Agricultural Water Efficiency and Productivity on the African and global level

8-15 June 2015 - Şanlıurfa, Turkey

The application of FAO's MASSCOTE approach

Strengthening Agricultural Water Efficiency and Productivity on the African and global level

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Food and Agriculture Organization of the United Nations

REPUBLIC OF TURKEY
MINISTRY OF DEVELOPMENT
SOUTHEASTERN ANATOLIA PROJECT
REGIONAL DEVELOPMENT ADMINISTRATION

AgWA
Partnership for agricultural water for Africa

Enhancing water efficiency in small-scale irrigation

This technical note was prepared in the context of the Regional Workshop on "Enhancing Water Use Efficiency – The Application of the MASSCOTE Approach', which is part of the activities to attain Outcome I of the Project *"Strengthening Agricultural Water Efficiency and Productivity on the African and global level' funded by the Swiss Agency for Development and Cooperation (SDC)*. The note has the objective to give a summary of the project, introduce the MASSCOTE approach, introduce the host institute, and provide a tentative agenda of the Workshop.

1. Project Summary

Africa is a rural continent where agriculture plays an important role in its social and economic development. The agricultural sector accounts for about 60 percent of the total labour force, 20 percent of total merchandise exports and 17 percent of the GDP. Notwithstanding the importance of the sector, productivity levels are far from reaching its full potential. In rain fed areas, which are predominant in the continent, reliance on irregular and unreliable rainfall is one of the major causes behind the low crop yields that characterize African agriculture. In irrigated areas, the lack of modern irrigation systems and the bad state of infrastructure lead to considerable water losses, that is eventually translated into lower productivity levels. This, coupled with inadequate farming management practices, has resulted in low water productivity and use efficiency in both irrigated and rain-fed areas. Improved Agriculture Water Management (AWM) can play a key role in increasing water use efficiency and productivity. Within rain-fed agriculture, AWM includes the more efficient use of green water (soil moisture), developing water harvesting capacity and using supplementary/deficit irrigation techniques. For irrigated agriculture, improved AWM would target at reducing water losses from drainage, seepage and non-productive evaporation.

2. Project Outcomes

I. Agricultural Water Management in Burkina Faso, Morocco and Uganda is improved and mainstreamed in national frameworks and processes;

II. Knowledge and knowhow of Agricultural Water Management with increased crop water productivity/efficiency of water use and its mainstreaming in policy is capitalized, disseminated and used in Africa and globally.

3. Project Outputs

1. Enhanced capacity for improved Water Productivity in small-scale agriculture;

2. Enhanced capacity for increased Water Use Efficiency in small-scale irrigation;

3. Enhanced Water Harvesting capacity for agriculture;

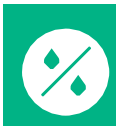
4. National Water Audits are prepared for the three project countries;

5. Bankable investment projects in AWM for Burkina Faso are defined;

6. Investment profile for the identification of AWM priorities in Morocco is produced;

7. Bankable investment projects in AWM for Uganda are prepared;

8. Outreach materials, including guidelines for decision makers and extension agents are prepared.



Activity 2.1

Conduct training programmes at regional and national levels targeted to agriculture water extension agents, water professionals and farmers' representatives, including those responsible of the management of irrigation schemes, in the use of tools to analyse and evaluate the performance of small-scale irrigation systems.

4. Water Use Efficiency

In irrigation, Water Use Efficiency (WUE) represents the ratio between effective water use and actual water withdrawal. It characterizes, in a specific process, how effective is the use of water. Efficiency is both scale and process dependent.

Questions on WUE

1. What are the scope/priorities for improving Water Use Efficiency (at canal/system level, at field level, at scheme level?
2. With what degree of certainty WUE and measurements are known (water delivery, inflow, etc.)?
3. How does WUE scale up from field to system and scheme (water recycling, formal and informal irrigation practices, rain-fed irrigation, etc.)?
4. What are the specific leverages for improving WUE at farm/field level, at system/scheme level)?

5. MASSCOTE Methodology[1]

This output of the project is targeted at improving the performance of irrigation systems for small-scale irrigation in the three project countries. It will be done by applying the FAO developed MASSCOTE methodology. The methodology has been adapted to fit the characteristics of small-scale irrigation schemes. It will include a baseline system analysis through Rapid Appraisal Procedures (with the application of alternative techniques for rapid measurement of canal water) and propose improved field operations and water services to users. MASSCOTE aims to organize the development of modernization programmes through: mapping various system characteristics; delimiting institutionally and spatially manageable subunits; and defining the strategy for service and operation for each unit.

Figure 1: Steps in the MASSCOTE approach

[1] Modernizing Irrigation Management - the MASSCOTE Approach: Mapping System and Services For Canal Operation Techniques (FAO Irrigation and Drainage Papers) Paperback – July 30, 2007

Table 1: The MASSCOTE framework

Mapping	Phase A – baseline information
1. The performance (RAP)	Initial rapid system diagnosis and performance assessment through the RAP. The primary objective of the RAP is to allow qualified personnel to determine systematically and quickly key indicators of the system in order to identify and prioritize modernization improvements. The second objective is to start mobilizing the energy of the actors (managers and users) for modernization. The third objective is to generate a baseline assessment, against which progress can be measured.
2. The capacity & sensitivity of the system	The assessment of the physical capacity of irrigation structures to perform their function of conveyance, control, measurement, etc. The assessment of the sensitivity of irrigation structures (offtakes and cross-regulators), identification of singular points. Mapping the sensitivity of the system.
3. The perturbations	Perturbations analysis: causes, magnitudes, frequency and options for coping.
4. The networks & water balances	This step consists of assessing the hierarchical structure and the main features of the irrigation and drainage networks, on the basis of which water balances at system and subsystem levels can be determined. Surface water and groundwater mapping of the opportunities and constraints.
5. The cost of O&M	Mapping the costs associated with current operational techniques and resulting services, disaggregating the different cost elements; cost analysis of options for various levels of services with current techniques and with improved techniques.
Mapping	**Phase B – Vision of SOM & modernization of canal operation**
6. The service to users	Mapping and economic analysis of the potential range of services to be provided to users. Mapping a vision of the irrigation scheme.
7. The management units	The irrigation system and the service area should be divided into subunits (subsystems and/or unit areas for service) that are uniform and/or separate from one another with well-defined boundaries.
8. The demand for operation	Assessing the resources, opportunities and demand for improved canal operation. A spatial analysis of the entire service area, with preliminary identification of subsystem units (management, service, O&M, etc.).
9. The options for canal operation improvements / units	Identifying improvement options (service and economic feasibility) for each management unit for: (i) water management, (ii) water control, and (iii) canal operation.
10. The integration of SOM options	Integration of the preferred options at the system level, and functional cohesiveness check. Consolidation and design of an overall information management system for supporting operation.
11. A consolidated vision & a plan for modernization and M&E	Consolidating the vision for the Irrigation scheme. Finalizing a modernization strategy and progressive capacity development. Selecting/choosing/deciding/phasing the options for improvements. A plan for M&E of the project inputs and outcomes.

6. Objective of the workshop

The main objective of the workshop is to build capacities of water professionals from Burkina Faso, Morocco and Uganda (as well as the host country as a step towards south-south cooperation) on increasing water use efficiency of irrigation systems by stimulating critical senses of agricultural water management in diagnosing and evaluating obstacles, constraints and opportunities, and in developing consistent modernization plans/ strategies.

MASSCOTE methodology has been developed in a step-by-step approach in order to convert the overall complexity into simple and straightforward elements. These are then explored in a recursive process leading progressively to a new management setup and improvements in canal operation in order to facilitate the move towards more effective water management and improved water delivery services.

7. Southeastern Anatolia Project (Güneydogu Anadolu Projesi: GAP)

The Southeastern Anatolia Project (in Turkish: Güneydogu Anadolu Projesi, or GAP), in its historical context, was formulated within a series of water and land resources development projects in the 1970s, which was later transformed in the early 1980s to a multi-sectorial, socio-economic regional development program. In 1995, the Social Action Plan was a major step towards a greater integration of sustainable development with socio-economic and infrastructure projects. The water development program of GAP includes 13 main irrigation and energy projects, seven of which are in the lower Euphrates sub-basin and six in the Tigris sub-basin. The program envisages the construction of 22 dams and 19 hydropower plants and introduction over an area of 1.7 million hectares for irrigation. GAPs unique mandate allows it to integrate various social and economic sectors. This integration is described in three pillars that support sustainable human development. These are: public investments, private sector involvement and peoples' participation. These three elements work together to bring about sustainable human development and address issues such as gender, economic viability, environmental and spatial sustainability and fairness in development.

Workshop agenda

DAY 1 - Monday 8th June	
9:00	Registration
9.30	**Official inaugural session** Welcome Speech **Mehmet AÇIKGÖZ**, Vice President of GAP Administration Welcome Speech and Presentation of the MASSCOTE Project **Maher SALMAN**, Project Leader, FAO Southeastern Anatolia Project (GAP) Presentation **Ahmet TOKDEMİR,** Private Sector and Entrepreneurship Coordinator, GAP RDA
10.30	Coffee/Tea Break
11:00	Water Use Efficiency: Conceptual approach
12:00	Introduction to FAO MASSCOTE approach
13.00	Lunch Break
Water Efficiency Assessment	
14:00	Generalities & indicators
15:00	Application to pressurized systems: sprinkler, drip
16:00	Application to surface irrigation

DAY 2 - Tuesday 9th June	
8.30	Assessing Performance and Productivity at Small Scale Irrigation
10.00	Coffee/Tea Break
10:30	MASSCOTE For Small Scale Irrigation - **STEP 1 (The Rapid Appraisal Procedure - RAP)**
13.00	Lunch Break
14:30	Presentation of the irrigation system to be investigated RAP Project office interviews Water User Association
16:00	Departure to Ataturk Dam and Yaylak Pumping Irrigation Area
20:00	Dinner

DAY 3 - Wednesday 10th June	
8.00	**FIELD VISIT (I):** Group visit to Head-works, Canals and Fields Travel to the canals, and interviews with main canal operators • Interviews with operations staff and tour of control structures • Interviews with farmers • Field visit for different irrigation application techniques

DAY 4 - Thursday 11th June	
7.30	FIELD VISIT (II)
12:30	Lunch
14:00	Group sessions for filling the RAP sheets in Hotel
17:00	Visit to Sanliurfa Museum

DAY 5 - Friday 12th June	
8.30	RAP results and consolidation of indicators
14:00	MASSCOTE Steps 2 and 3 - **Capacity, Sensitivity and Perturbations**
16:00	Working group session on Step 2 and 3

Saturday 13th June – Day Off	
08:30	Departure to Halfeti
10:00	Arrival to Halfeti
10:30	Boat Tour Birecik Dam
12:00	Lunch
13:00	Departure to Gaziantep
14:30	Visit to Zeugma Museum
15:30	Visit to Bazaars
18:00	Dinner (İmam Çağdaş Restaurant)
19:00	Departure to Sanliurfa

DAY 6 - Sunday 14th June	
8.30	MASSCOTE Step 4 - **Water Balance**
09:15	MASSCOTE Steps 5 and 6 - **Cost, Service and Vision: System and field**
10.00	Coffee/Tea Break
10:30	Using integrated low-cost, high-tech and user centred approaches in order to measure and account for water at local levels in irrigation - Presentation of the iMoMo Approach
13.00	Lunch Break
14:00	Working group session on steps 4, 5 and 6 Report and finalization of the vision: SOM, WUE at field level and MASSCOTE for Small Scale Irrigation
19:30	Traditional Night (Manici Hotel)

DAY 7 - Monday 15th June	
8.30	Presentation on Steps 7, 8, 9 and 10 - Management, Demand for Operation, Improvements and Integration
10.00	Coffee/Tea Break
10:30	Group work on Steps 7, 8, 9 and 10
13.00	Lunch Break
14:00	Discussion, consolidation and integration of options for improvements: Preparation for presentations
16:00	**OUTCOMES AND CLOSING CEREMONY**

Resource Persons

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Daniel Renault, International Consultant, Land and Water Division, FAO-Rome

Fethi Lebdi, AgWA Coordinator, FAO Sub Regional Office for Eastern Africa (SFE)

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