

## New legislation for Water User Associations (WUA): Increasing sustainability in irrigation project implementation in Lebanon

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**Abstract:** The cost of implementing new irrigation projects is high, especially when using pressurised systems. In Lebanon, in addition to implementation costs, funds are often necessary for land reclamation works and cadastral plans which are, in certain cases, provisional or inexistent in the rural area. Such costs and even the purpose of a project may be lost after execution if farmers do not irrigate their lands. The objective of this paper is to increase farmers' involvement in the preparation and implementation of the "Hydro-Agricultural Project for Marjeyoun Area" in southern Lebanon where security conditions hinder design. This involvement will be through a Water User Association (WUA) to ensure that the feasibility of the project will be realised and will involve farmers in decision making and execution. The output of this study is draft legislation for approval by the Lebanese government and for publication in the official journal. The law will regulate and organise the creation and operation of such associations prior to the implementation of the project, for better governance in the irrigation sector. The WUA law implemented on this particular project will be a pilot study for other irrigation projects all over the nation.

**Key words:** South Lebanon, Water User Association (WUA), Decision Making, Governance, irrigation project.

### 1. INTRODUCTION

Many water needs studies conducted by the Ministry of Energy and Water (MEW) in Lebanon show a deficit for the coming 15 to 20 years. MEW has previewed a ten-year plan for dams and mountain ponds to prevent a future shortage of water (NPMPLT, 2005). This plan is very significant in itself but it needs to be completed by further, more important actions related to Integrated Water Resources Management.

The plan must pay particular attention to the high cost irrigation sector, which will consume more than 56% of water resources, in order to achieve important water and economic savings. Further savings could be made on operation and maintenance costs and in the execution of new networks where many owners prefer to shift their land use from agricultural to urban purposes.

The main problems for the development of the irrigation sector in Lebanon are:

- Vandalism on the outlets, especially on volume water counters and flow controllers, by people who wish to bypass the system. This results in inequity in water distribution between farmers and a reduction of the system's capacity to serve all of the area within the irrigation perimeter. For a region such as the South Bekaa Project (first phase covering 2,000 ha), where allocated water covers an area equivalent to the third of the project, such activity can cause major disruption.
- Absence of urban plans that allow farmers to change land use from agriculture to urban construction. Traditional villages are built in hilly areas and on cultivated lands that are reserved for agriculture. Over time, these settlements have spread down the valleys towards larger towns and so, many farmers attracted by the high prices of land parcels bordering urban zones, stop cultivating and sell their properties. Consequently, irrigation projects are abandoned after network execution and this practice is very significant because it has seen

the loss of Lebanon's coastal valleys. As an example, in the pilot sector of Saida-Jezzine in South Lebanon which has a network covering an area of 280 ha, only around one hundred hectares are irrigated, compared to the 300 ha outside the perimeter that are irrigated by the main network in different villages not covered by the distribution network.

From these past experiences, it has been agreed that the only way to preserve the sustainability of irrigation projects is to involve final users in the preparation and implementation process. In a post-implementation phase these users will also have the task of managing the network using the technical knowledge and skills acquired in the previous phase.

This idea was generated during the preparation and implementation of the distribution network and irrigation of Canal 800 in the Litani River System within the "Hydro-Agricultural Project for Marjeyoun Area". It called for a governance approach requiring participation by all users through the creation of a Water User Association (WUA) because it is argued that people's direct involvement contributes to the achievement of the five main objectives of water supply projects: effectiveness, efficiency, empowerment, equity and coverage (Narayan, 1995). However, there is no empirical evidence to show the positive relationship between participation and the projects' outcomes (Clever, 2001). Governance in this instance is defined as the manner in which the government exercises power in the management of a country's economic and social resources (Singh *et al.*, 2009) and participation refers to the extent to which beneficiaries are involved in information, consultation, decision making and initiating action (Narayan, 1995).

All over the Mediterranean, the participation of Non-Governmental Organisations (NGOs) and Water User Associations (WUAs) is increasing, particularly in local water management consultations (MED-EUMI, 2008). Moreover, water user associations demonstrate the importance of joining local knowledge with modern information tools (Narayan, 1995).

Water User Association legislation can be a useful in preventing distortion and financial loss in a project. A project's feasibility study may be distorted if there is insufficient subscription within some perimeters. To avoid the resultant lost expenditure in the distribution network, it is possible to exclude a perimeter from the total project area. This can be actioned before the execution of the distribution network when a WUA is implemented. Also at this stage, a WUA can help in other preparatory works:

- Preparation of cadastral plans.
- Facilitation of access to work places and execution of land classification and land reclamation.
- Hydrant plan design.

An additional challenge is the over-exploitation of underground water where there is an absence of management and pumping control. Current legislation includes permission and standards given by MEW for drilling wells. However, most well owners do not adhere to this law and the great number of exploited wells has led to a dramatic lowering of the water table (El Moujabber *et al.* 2006). This, in turn, has resulted in salinization in coastal areas followed by inland drought (El Chami *et al.* 2009). WUA legislation can remediate the depletion of underground water through WUA self-control backed up by MEW control.

Therefore, the main purpose of this paper is to necessarily include farmers in the entire water resources management process in order to produce quicker, concrete results and to promote good future management of Marjeyoun North perimeter. This objective can be achieved by the creation of a Water User Association (WUA) before the implementation phase of the project. Such WUA law, implemented on this specific project will be a pilot study for other irrigation projects all over the national territory.

## 2. MATERIAL AND METHODS

### 2.1 Marjeyoun Pilot sector

Marjeyoun North Perimeter is selected as a pilot sector of about 15.000 ha in which to execute and test all of the tasks mentioned above in order to enhance the applied methodologies of works, legislation amendments and to improve the schedule implementation of irrigation in the 800 Canal project. The Gross Irrigated area of Marjeyoun North is 745 ha and the Net Irrigated Area is 522 ha.

The cadastral district of Marjeyoun North Perimeter includes five villages (Figure 1), which are: Dibbine, Jdeidet Marjeyoun, Borghos, Blat & Ibl El Saki.

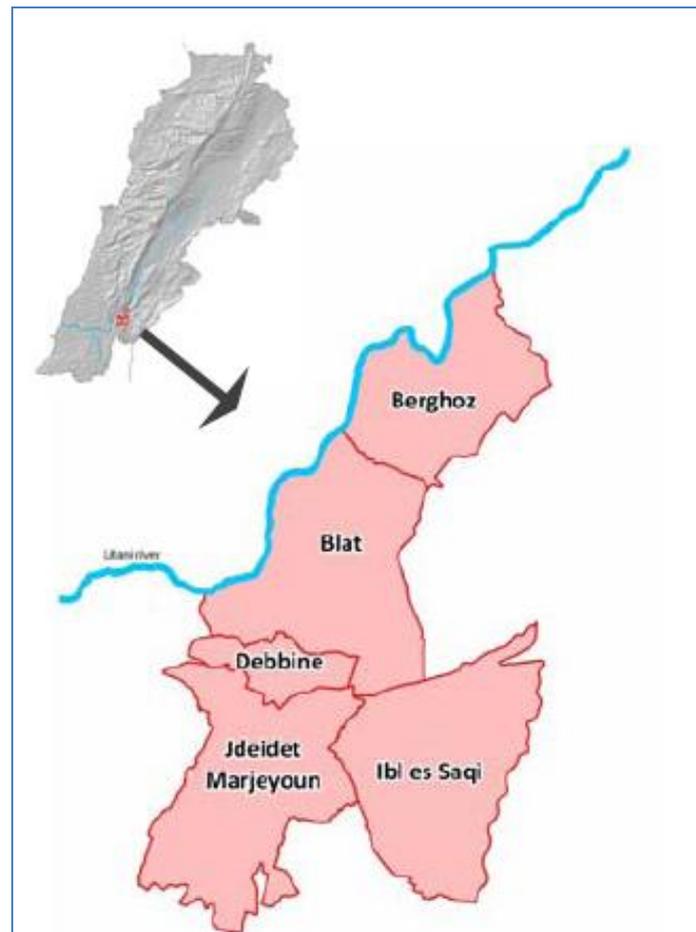


Figure 1. The study area including five villages in Marjeyoun North district.

### 2.2 WUA draft law

Draft WUA legislation has been initiated by the “Hydro-Agricultural Project for Marjeyoun Area” by subcontracting to the “Association of Friends of Ibrahim Abdel Al”, which is an active NGO member and governor in the World Water Council. The implementation of a WUA requires many integrated actions for its development which may be divided into two main phases:

*Legislation:* Local and international experts collaborated to prepare laws and decrees. The mandate of the created legislation and/or WUA status was to find solutions for solving expropriation problems in access rights and future water management at parcel level. Lobbying efforts must be undertaken to disseminate this idea and find approval for this law.

The draft is awaiting approval by parliament in order to be published in the official journal which would bring the new law into effect.

*WUA creation:* A campaign of extension (information, exchange with experienced countries, training and monitoring) addressed to farmers has already been launched in order to involve them in the WUA which is in the process of being implemented.

### **3. RESULTS AND DISCUSSION**

The responsibility of a WUA, as given by the draft law, is extended to the area covered by a distribution network at tertiary level. The new advantages of this draft law regarding irrigation users are described as follows:

#### ***3.1 Governance***

The formation of water user association (WUA) is dependant on one of two scenarios:

- 50% of farmers are willing to create and become members of the association. Or
- 50% or more of the perimeter's area is owned by farmer members of the association.

In other words, the law represents an inquiry to determine the willingness of farmers to allocate individual perimeters for agriculture in order to plan and implement irrigation projects. Where neither of the above conditions met meaning that no WUA will be created, it will be assumed that land owners are not interested in agriculture.

The board of the WUA, as defined in the draft law, would be elected by farmers themselves rather than placed in post by governmental institutions as is the current practice in Lebanon. An elected board will be better disposed to pursue the interests of the electors rather than partisan groups/individuals. To the current issues surrounding this, approximately 67 small and medium irrigation schemes exist in Lebanon but only one has been working effectively since 1943 because the municipality, an elected institution, manages the operations board in line with the electorates' mandate.

The presence of such an association will help to organise and represent farmers and will benefit from being in direct contact with them. It will assist the project team in achieving the basic steps required for any project areas that need farmers' participation (e.g. farmers' consensus, cadastral plans, land reclamation, right of way etc.).

Moreover, the WUA's creation will play a significant role in solving water conflicts in a fair way which preserves the rights of all members. In other matters, membership contributes to conflict prevention where civil status law could be a limitation to certain works in the field.

#### ***3.1 Projects' Sustainability***

One of the main targets of the new legislation is to preserve sustainability of perimeters and projects. Irrigation rights are linked to the parcel and no irrigation project will be implemented if the local population is not willing to irrigate. Therefore, the presence of a WUA is a precondition for any proposal for irrigation projects.

The governance approach, increases sustainability of irrigation projects, because the aggregation of farmers in WUA, gives the perimeter a de facto classification as agricultural land and no urban development may take place.

#### ***3.3 Role of WUA in preparation for network implementation***

The role that the WUA undertakes, with input from farmers on one side and the project team on the other, will increase the efficiency and effectiveness of the project. Additionally, the costs and

time required in realising the different tasks means that owner participation is essential for their achievement.

In any irrigation project, specifically in Marjeyoun North perimeter, the step that follows WUA implementation is preparation for the irrigation network implementation. The network is an on-demand and pressurised water irrigation system with a full telemetry SCADA control operation system. The implementation of the network will involve the following actions:

- Cadastral mapping: Cadastral plans are the bases for studies of distribution networks. Such plans do not exist in many Lebanese regions and are incomplete in those where they do. Representatives from the WUA will stand in for local farmers in the delineation of parcels.
- Detailed land classification of ability to irrigate: For technical, economical equity between farmers, detailed land classification must be carried out because it will identify which parcels may be irrigated within each perimeter. Farmer members of the WUA give implicit agreement for entry to farms to create soil profiles and take soil samples.
- Land reclamation design and works: Lebanon has a hilly topography and many agricultural areas need land reclamation works (main and complementary works). Main works are expensive and need engineering conceptualisation and heavy machinery. The execution per individual parcel takes a long time and sometimes not all parcels in an irrigation perimeter can be accessed. It is necessary to achieve works by perimeter, because it will be exhaustive, faster and more economic. The actual legislation requires that these works are conducted at the request of the owner or must at least have their agreement. So, one of two solutions can be adopted in mitigation, either amending legislation or involving local civil society in facilitating the process. The creation of associations like Water User Associations (WUA) will be very efficient for this purpose.
- Hydrant design and expropriation: the design of hydrants must take into consideration the necessity of assuring easy access for every user. This must be verified at farms level in close collaboration with farmers, through the WUA, to solve any issues around exclusion. Moreover, land expropriation, where the network passes through parcels, can be reduced by new access rights and rules for compensation or damages in respect of maintenance works within the draft law.
- The project previews a future role for WUAs in the management of the project at the tertiary network level. The technical knowledge acquired by the WUA throughout the implementation phase will be useful for capacity building. In collaboration with farmers via the WUA, areas controlled by WUA may be defined.

### ***3.4 Irrigation schemes***

In implemented projects, new legislation obliges farmers to establish WUAs. Therefore, obligatory subscription to irrigation arises from membership of the WUA. The role of WUA is to manage the distribution network and to prevent water conflict among members.

### ***3.5 Underground water***

For underground water, the law obliges the creation of a WUA where more than one user will be pumping from the same underground water source. The WUA must provide MEW with data related to pumped volumes and variation in the depth of water table. This represents a double control for water use and is intended to achieve an balance between water use and renewable yearly water.

## **4. CONCLUSION**

In current Lebanese legislation, two forms of association are available: Agricultural Co-

operatives and Hydraulic Syndicate Associations (Association Syndicale Hydraulique). The first has a different mandate from the proposed Water User Association. The second, created by decree 320 in 1926 has the principal objective of protecting against flood damages and while irrigation is mentioned no detailed texts are available.

This draft law is an important step towards the proper organisation of irrigation water users. It is expected to increase users' participation in the design, implementation and management of the irrigation sector that contributes to the socio-economic development of local communities.

Finally, the creation of WUAs, as indicated by the draft law, can contribute to the achievement of the main objectives of a water supply project (Narayan, 1995) in terms of effectiveness, efficiency, empowerment, equity and coverage. Therefore, Water User Association legislation can be an action to prevent distortion and losses in the hydro-agricultural development of the South Lebanon project that will be implemented after the WUA creation. Further, this project may be considered a pilot area and the legislation will come into effect all over the Lebanese territory and will be implemented for existing irrigation schemes as well as for new projects.

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