



# IRRIGATION PROJECTS IMPLEMENTED BY FAO IN LEBANON

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## **“COPING WITH WATER SCARCITY” PROGRAMME**

- Flagship programme of cooperation between Italy and FAO
- Duration of five years, Conducted in three phases

Year 1	Year 2	Year 3	Year 4	Year 5
Phase 1: Conceptual framework				
	Phase 2: Country-level water audits			
		Phase 3: Strengthening national capacities		

- The current Project is linked to phase 3
- Focus on the reinforcement of local and national capacities to cope with water scarcity in a pilot irrigation scheme in Lebanon





## PAST AND RELATED WORK

- FAO: GCP/INT/124/ITA- Coping with water scarcity – the role of agriculture; Phase III: strengthening national capacities ” (Jordan, Lebanon and Syria)
- FAO: TCP/INT/3301- Support to policy consultation and actions to boost sustainable use of water and energy resources for agricultural production in the NENA Region (water, energy, technology and knowledge)
- Italian Cooperation – Implemented by AVSI:
  - 2008: Rehabilitation of an irrigation canal in the Plain of Marjayoun.
  - 2007 - 2008: Restoration of the economic status of rural population in Marjayoun - Khiam hit by the 2006 conflict.
  - 2009 - 2010: Replacement of open irrigation canals with covered pipelines

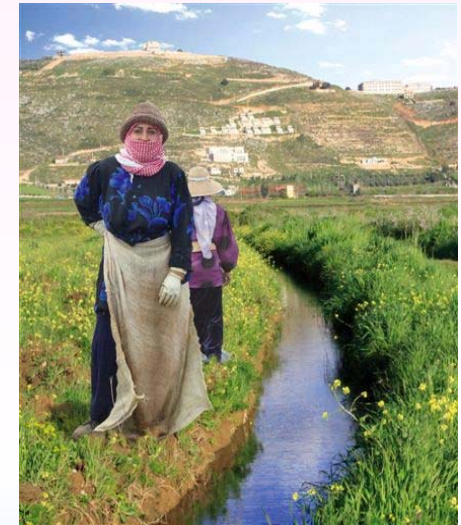






## RATIONALE/JUSTIFICATION

- Scarce water resources, degraded lands and inappropriately used water resources CAUSING rural areas an increase of the poverty and a reduction of the local development
- Devastating effects of the 2006 conflict on irrigation system and water canalization



Unless radical measures are taken, situation is expected to become exacerbated in the future

- Call upon FAO, Region of Lombardy, AVSI Foundation and the Lebanese Government, to assist the Caza of Marjyoun in facing the problems related to the lack of a rural development





## PROJECT AREA (THE CAZA OF MARJAYOUN)

- Surface of 313 km<sup>2</sup>
- Population of 42 000 inhabitants
- Lack of sewing system, lack of proper irrigation system, almost obsolete electric system (apart from recent few tracts renovated), waste management system is not in place
- Main source of income is agriculture – with two demographic trends: progressive “ageing” & decline in rural population
- The Plain is an open air vegetable garden but the main irrigation canals have deteriorated with consequent abandonment of land







## PROJECT AREA (THE CAZA OF MARJAYOUN)

- Agricultural lands: 914 ha
- In 2009 : 30 ha irrigated
- In 2010: 50 ha irrigated
- Potentially irrigated: 157 ha
  
- Villages involved: Bourj El Moulouk- Kfar Kila – Khiam – Marjeyoun – Qlaiaa
  
- Lack of sewing systems, use of septic tanks polluting water, lack of proper irrigation systems, pumping of drinking water from wells for farming





## STAKEHODLERS AND BENEFICIARIES

- Ministry of Agriculture (MOA)
- Members of the Dardara Cooperative/  
Water User Association
- Ministry of Energy and Water (MOEW) -  
the General Directorate of Hydraulic and  
Electric Resources and the General  
Directorate of Exploitation
- Water Establishments (Wes)
- Local Authorities
- Direct Beneficiaries: More than 42,000  
people living the 5 villages involved







## PROJECT CONCEPTUAL FRAMEWORK - IMPACT

Strengthen local and national capacities to increase agricultural productivity through improved water demand management to increase the economic return of irrigation water

- Change cropping patterns and grow high-value crops under irrigation
- Control water allocation so that it will be demand driven
- Modern and flexible irrigation systems with reliable irrigation water delivery services
- Reduce water losses from drainage, seepage and non-productive evaporation





## OBJECTIVES AND OUTPUTS

### OBJECTIVE 1

Contribute towards improved **water demand management** in irrigation

### OUTPUT 1

- a) Water resources of the Dardara Spring are rationalized and efficiently managed
- b) Water User Association of the Dardara is empowered and its capacity is strengthened so self-reliant association is maintained.



## OBJECTIVES AND OUTPUTS

### OBJECTIVE 2

Contribute to **increased knowledge** of farmers and institutional personnel with regard to new **irrigation technology** and **management practices** to enhance efficiency and productivity of water use

### OUTPUT 2

- a) Measurable improvements in water productivity at field level
- b) Understanding of crop water requirements and irrigation scheduling for farmers and extension workers is improved
- c) Understanding of drip irrigation system operation and maintenance for farmers is improved





## ACTIVITIES 1

- Assessment of the design and operation of the identified irrigation system within the Plain of Marjayoun
  - hydrological study to define water availability
  - hydraulic study to design the canal system
  - economic study to analyze the socio-economic impact of the project
- Application of technical tools:
  - MASSPRESS, the FAO developed tool to map systems and services for pressurized irrigation and define options to improve operation practices
  - MASSCOTE, the FAO developed tool to map systems and services for canal operation techniques
  - AquaCrop, FAO's crop model to simulate yield response to water





## ACTIVITIES 2

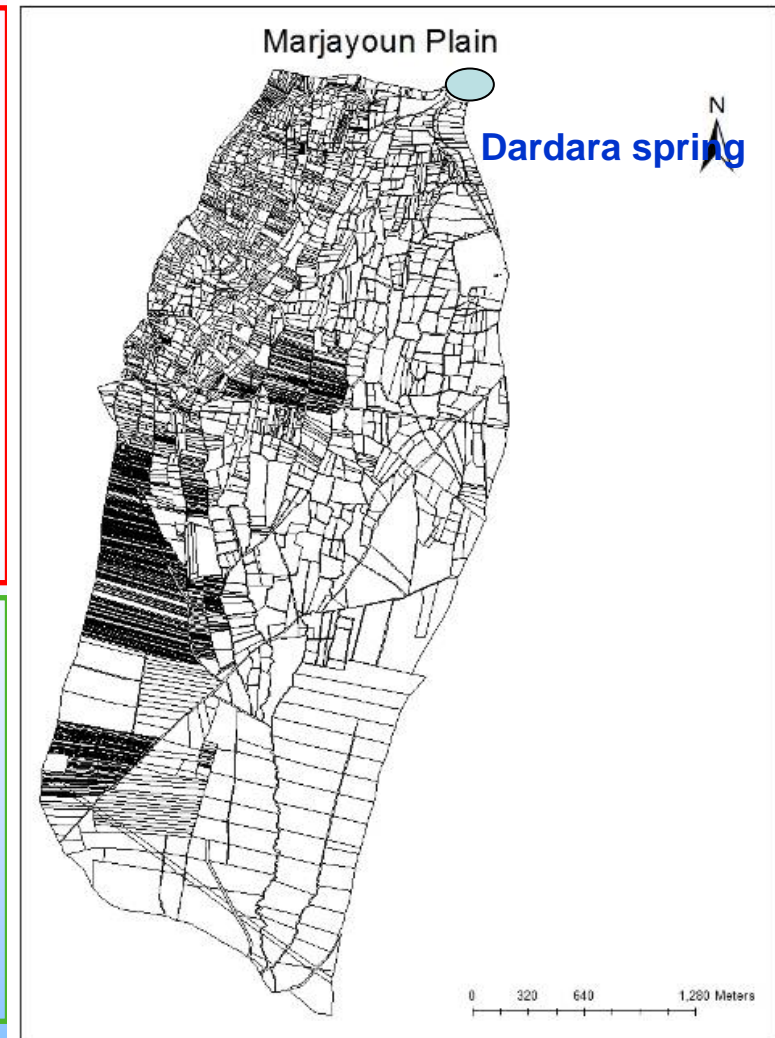
- Design a capacity development plan through an approach based on learning by doing
- Design a monitoring programme to scrutinize the effectiveness of the capacity development plan
- Organize training sessions for farmers
- Monitor the results of the training programme in terms of gains water productivity
- Technical interventions being introduced by the AVSI Foundation towards the rehabilitation of the irrigation canals





## ACTIVITIES – TECHNICAL INTERVENTIONS

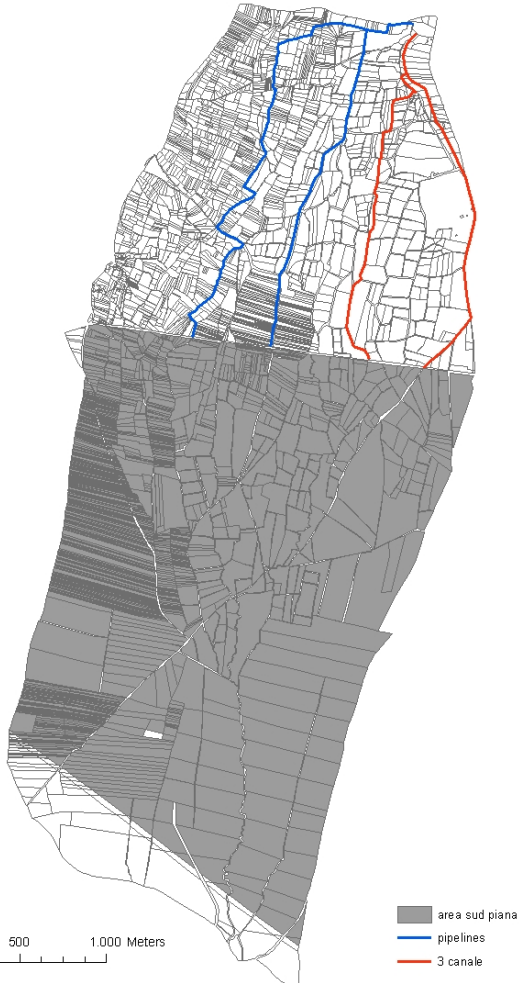
- AVSI rehabilitated open canals in the North-West part of the Plain
  - WUA established and responsible for maintenance and distribution of water
  - Potential irrigation area of 157 hectares (1039 fields or 16.6% of the total area of the Plain)
- Third pipeline in the Eastern part of the Plain is under construction
  - The pipeline covers a potential irrigation area of 99 hectares (10.5% of the total area of the Plain)





## ACTIVITIES – TECHNICAL INTERVENTIONS 2

Piana Marjayoun - Area parte sud



- Extend the replacement of the two irrigation canals with covered pipelines
- Further potential irrigation area of about 200 hectares within the Southern part of the plain that has a total area of 600 hectares





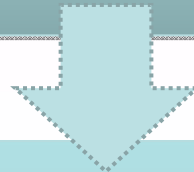
## Coping with Water Scarcity (The Role of Agriculture): Phase III - Strengthening national capacities

- Cooperation between Government of Italy and FAO
- GCP/INT/124
- Starting date: 2011 – End Date: 2014
- Regional Project : Lebanon – Jordan - Syria



## RATIONALE/JUSTIFICATION

- ✓ shortage in water supply (geographic and climatic conditions)
- ✓ Increased gap between water demand and water availability (demography, economies relying mainly on agriculture and climate change effect)



- ✓ Gradual transition towards Water Demand Management
- ✓ Find alternatives to Fresh water (re-use of treated wastewater)

At decision-making level, impact on water productivity and water allocation

Cooperation  
Programme  
between the  
Government of  
Italy and FAO







## PROJECT CONCEPTUAL FRAMEWORK - IMPACT

The project will facilitate countries **to improve their capacity to cope with water scarcity** as a result of **improved knowledge of their water resources situation** in general and **increased skills of technology** in the way water is being used in the agricultural sector in particular



## OBJECTIVES AND OUTPUTS

### OBJECTIVE

The outcome of the project will be :

**strengthened national capacities** regarding possible interventions  
for **improved water management** in general, and dealing with  
the **agricultural component of water scarcity** in particular





# OBJECTIVES AND OUTPUTS

## OUTPUTS

a) Increased capacity for water demand management in large-scale irrigation systems:

- ✓ Regional capacity building workshop in the use of RAP (Rapid Appraisal Performance of large collective irrigation networks)

b) Increased capacity to enhance water productivity in agriculture

- ✓ Regional capacity building workshop in the use of CROPWAT and AquaCrop to calculate irrigation water requirements and predict yield response to water

c) Improved use of treated wastewater for irrigation at Iaat Wastewater Treatment Plant



## OBJECTIVES AND OUTPUTS

### OUTPUTS

c) Improved use of treated wastewater for irrigation at Iaat Wastewater Treatment Plant :

- ✓ Implement a fully developed and operational pilot area, equipped with modern irrigation equipment adapted for the use of treated waste water
- ✓ Assessing the treated waste water quality and quantity from Iaat Treatment plant
- ✓ Letter of Agreement with LARI for water and soil analysis





## CONCERNS

Unclear policies on wastewater reuse

Technology: adaptation and technical capacity

O&M costs and management problems

Legal aspects: restrictions on TWW use; use of raw WW

Institutional conflicts; unclear mandates

Social acceptance, reluctance (lack of awareness)



## Creation of Water Information Center

- Technical Cooperation Programme facility
- Gathering all related data and information
- FAO/MoA/MoEW
- NGO: Les Amis de l'Eau

### OUTPUTS

- ✓ National Archive created
- ✓ Web site data base operational





**THANK YOU**

