

# Improvement of Irrigation Water Management in Lebanon and Jordan



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MEDA Water



EUROPEAID  
CO-OPERATION OFFICE



Institute for University Cooperation Rome - Italy  
معهد تعاون الجامعات روما - إيطاليا



NCARTT



Associazione Volontari  
per il Servizio Internazionale



LITANI  
River Authority



CESAL



MEDA Water



EUROPEAID  
مكتب التعاون

Provided with the Support of the European Union

بدعم من البعثة الأوروبية



# Implementation Consortium

- **ICU, AVSI and CESAL**
- **National Center for Agricultural Research and Technology Transfer, *NCARTT* - Jordan**
- **Litani River Authority, *LRA* - Lebanon**

## Duration

The project outset was on 1° June 2003, with an implementation period of 48 months

## Budget

Source of funding	Contribution €	% of Total
EU	4.861.944	77.3
ICU	50.000	0.8
AVSI	50.000	0.8
LRA	668.200	10.6
NCARTT	660.000	10.5
Total	6.290.144	100.0

# PROJECT AREAS

- The intervention covers Lebanon and Jordan
- Activities are confined to the main agricultural regions in each country which are respectively the Bekaa Valley and the Jordan Valley

# ***OVERALL OBJECTIVE***

- Contribute to raise farmers' productions and incomes through the elimination of irrigation water losses
  - Increased irrigation water availability & quality
  - Increased irrigated lands
  - Decreased water unit cost
  - Raised crop production and income

# ***SPECIFIC OBJECTIVES***

## ***Objective specific to Jordan:***

- ❖ **To increase the availability of good quality irrigation water at farm level, in the central – southern Jordan River Valley**

## ***Objective specific to Lebanon:***

- ❖ **To make the lands along the Litani River between Qaraoun Lake and Bar Elias Village cultivable**

# ***SPECIFIC OBJECTIVES Cont'd***

## ***Objectives common to Lebanon and Jordan:***

- ❖ **Improve farmers' technical Know-how in the project areas**
- ❖ **Strengthen cooperation between Lebanon and Jordan in the domain of water management**

# ***EXPECTED RESULTS***

## **A) LEBANON**

- ❖ Part of Litani riverbed rehabilitated
- ❖ LRA strengthened
- ❖ Farmers' water management skills are improved through training

## **B) JORDAN**

- ❖ Increased efficiency of the irrigation systems in the central – southern Jordan River Valley
- ❖ Increased water stocking facilities at on-farm level
- ❖ NCARTT strengthened
- ❖ Farmers' water management skills are improved through training

## **C) LEBANON & JORDAN**

- ❖ Enhanced cooperation between the two countries in the domain of water



***JORDAN - Is the intervention relevant?  
Yes, because of the following problems:***

- **Decreased availability of irrigation water**
- **Agriculture development in the Jordan Valley still below potentialities**
- **Poor quality of water from the King Abdullah Canal interfering with the hydraulic functionality of the networks and the on-farm irrigation efficiency**
- **Soil deterioration within greenhouses and need of appropriate water storage facilities at farm level**
- **NCARTT Service Centre at Deir Alla has difficulties to meet farmers' needs and future challenges related to development of irrigated agriculture in the Valley**
- **Farmers in the Valley not skilled enough in irrigation management and modern farming practices**

# *PLANNED ACTIVITIES Jordan*

- Installation of upstream filtration unit at suitable turnout along the King Abdullah Canal
- Installation of on-farm filtration units in pilot farms
- Installation of fertigation units in pilot farms
- Installation of water harvesting units in pilot farms
- Rehabilitation and upgrading NCARTT Laboratory at Deir Alla for soil and water analysis
- Training NCARTT extension staff
- Provide farmers with training & extension service

# PROGRESS TO DATE - Jordan

- NCARTT Laboratory at Deir Alla rehabilitated and equipped for soil and water analysis
- Training of two Laboratory technicians in progress
- Field tests for the identification of most suitable on-farm filtering system implemented
- An upstream filtering system to be installed at the Turnout 70 of the KAC has been designed : it consists of a self-cleaning trash-rack and a screen filtering station
- A baseline survey of the DA 30 corresponding to the TO 70 has been carried out
- NCARTT Extension agents provided with three training courses: Communication management, Design of irrigation networks and fertigation.





# ***PROPOSED ACTIONS*** ***for improving relevancy, impact and*** ***sustainability - Jordan***

- **Expand the intervention to other Turnouts / pumping stations where water users cooperative are being established**
- **Support the process of devolving the responsibility for operation, maintenance and supervision of the hydraulic networks to members of water user cooperatives**
- **Adopt and support all measures leading to the adoption of modern irrigation technologies, according to the original design of the irrigation networks**
- **Coordinate with other projects/donors in the Valley, namely GTZ, MREA (Regional French Mission for Water & Agriculture) and USAID-KAFA'A, to avoid duplications, divergences in the approach and foster synergy**
- **Focus on appropriate technologies : improve sand filters locally manufactured and promote their dissemination**
- **Promote possible improvements of the traditional water storage systems (ponds) and limit their use to emergency**

# FACTORS ENSURING SUSTAINABILITY

## ■ Environmental protection

- ❖ The intervention aims at safeguarding water and soil resources

## ■ At Institutional level

- ❖ Strengthening the NCARTT (local partner) through capacity building and by upgrading the Service centre facilities
- ❖ Supporting JVA in managing the irrigation water according to the original design of the network

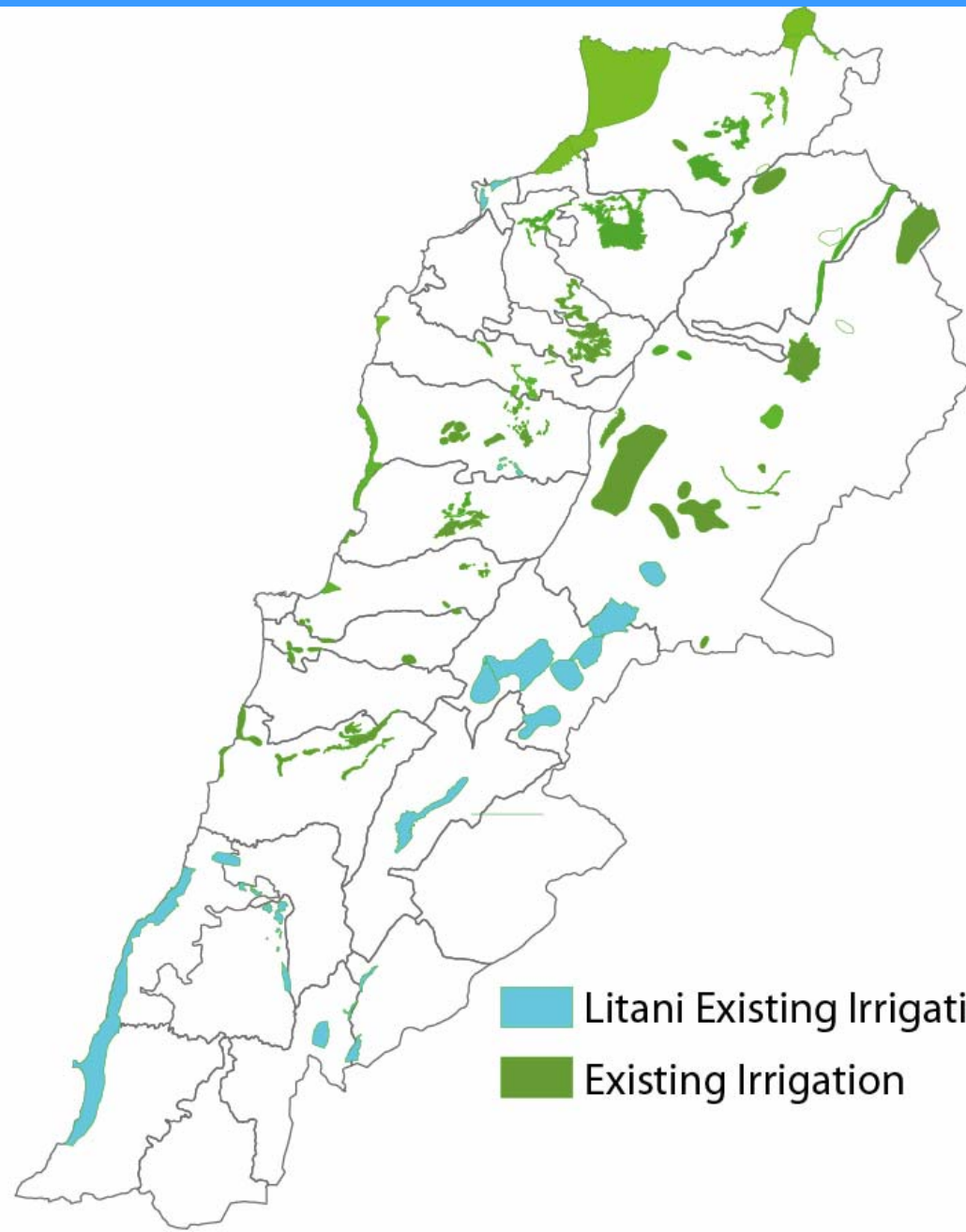
## ■ At target group level

- ❖ Promoting sense of ownership of the irrigation networks and provision of extension service through grass-root organisations
- ❖ Disseminate appropriate technologies

# Litani River Authority (LRA) Irrigation Projects on National Level

- Litani River **Flow** represent **30%** of Total Annual Flow of Lebanese Rivers
- **Geographical area** of Regions **concerned** by LRA Projects is **40%** of Total Lebanese Territories (Irrigation from Litani River and others Water Sources).
- Actual Irrigation represent 27% of Total Irrigated area in Lebanon
- LRA Ongoing and future Irrigation represent 74% from Total Lebanese Projects Area.
- **LRA Projects Represent 54% of Total Schemed Irrigation in Lebanon.**

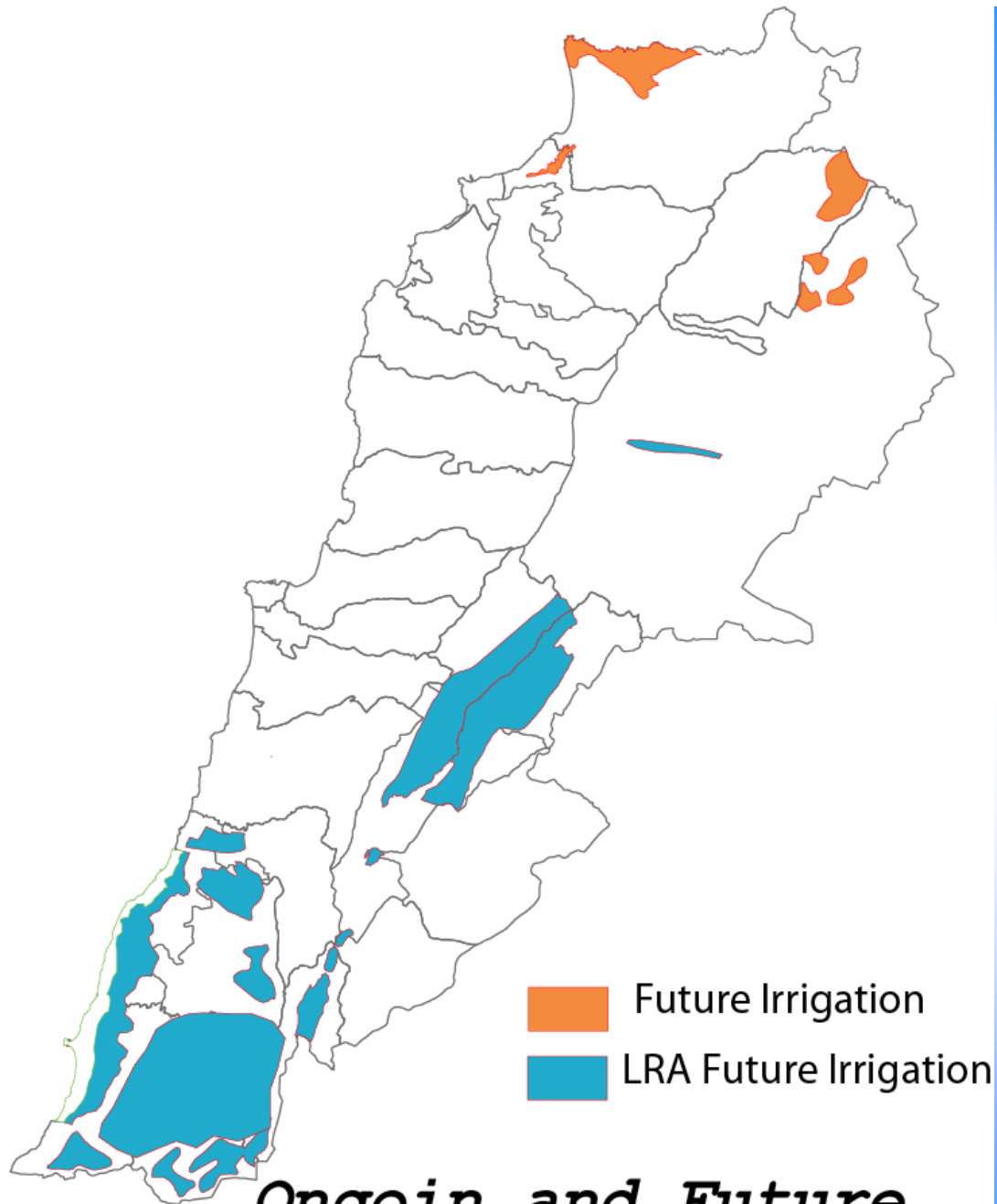




■ Litani Existing Irrigation  
■ Existing Irrigation

## ***Existing Irrigations schemes***





## *Ongoin and Future Irrigation Schemes*

# IRWA Activities - Lebanon

- Construction of Kherbet Qanafar services Center (First Stage represent 37% of total)
- Equipments for Soil, Water & Microbiological and Plant Pathology Laboratories- Weather Station
- Rehabilitation of Litani Bed and Effluents in Qaraaoun Lac Upstream
- Equipments for Litani and Effluents River Beds Maintenance
- LRA Personal Training for extension purposes: Engineers and Technicians
- Farmers Training (480)

# Kherbet Qanafar Services Center

- Center on Irrigation Matter at National Level:
  - Experimentation
  - Applied Research
  - Capacity Building
  - Extension Services
- Area field : 160 Hectare
- Maintenance and Parking for Machinery Working on River Bed Cleaning

# Kherbet Qanafar Services Center

- Reception of Constructions in January 2006
- Executed Potable water well
- Installed Electrical Generator
- LRA has:
  - Equip the center with electrical transformation station of 400 KVA
  - prepared tender document for road, parking, fence and external Lighting. Tender will be lunch on January 2006.

# Constructions in Kherbet Qanafar Center (Ready in January 2006)

Designation	Area in Square Meter
Administrative Building	650
Conference Room	220
Laboratory	405
Gardner Habitation	25
Rest House	140
<b>Total Building</b>	<b>1440</b>
Truck Park	440
<b>Total</b>	<b>1880</b>





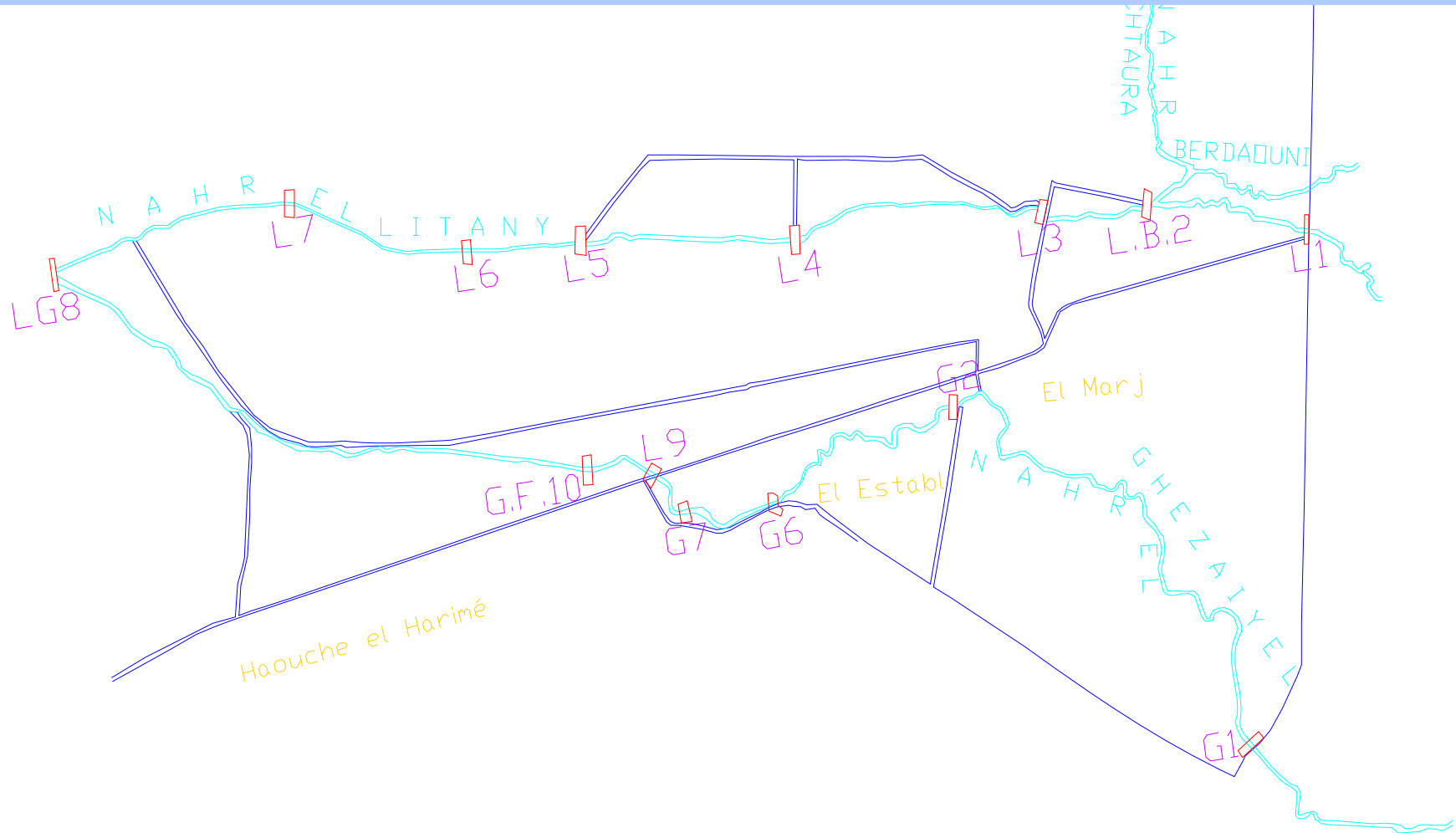
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# Litani and Effluents River Beds Rehabilitation

- Satellite Photos for Rehabilitation Area (220 Square Kilometer)
- Rehabilitation Study by Specialized office
- Tendering Process
- Execution by Local Contractor

# Rehabilitation work Points





2005 6 8



2005 9 28

# Litani & Effluents River Beds Maintenance

- **Reception** by First of July 2005 The Next Equipment:
  - **Long Reach JCB** JS 220 LR (MODEL 2005)
  - **JCB ROBOT** 1110 HF (MODEL 2005)
  - **Truck** (DAF) TYPE LF55-180 (MODEL 2005)
- After LRA personnel Training, Cleaning Works on Litani Bed and Effluents Begin at the End of July



## Executed Cleaning Works on Litani & Effluents River Beds

Intervention Points	Length in meter	Width in meter	Area in Square Meter
L0-L1	800	8	6400
L1	100	5	500
L3-L4	500	12	6000
L1-LB2	1150	8	9200
G1-G2	950	8	7600
G2-G6	500	13	6500
G6-GF10	1100	12	13200
Gf10-G11	400	6	2400
<b>Total</b>	<b>5500</b>		<b>51800</b>

# LRA Capacity Building and Farmers Training

- Capacity Building of Engineers and Technicians Working in the Project
- Demonstration Plots
- Farmers Training (480 persons)



# LRA and IRWA Personnel Training

Course	Duration (Day)	Participants		
		Engineers		Technicians
		IRWA	LRA	
Communication Skills and Time Management	11	4	4	-
Sprinkler Irrigation	1	1	3	8
Trickle irrigation	1	1	3	8
Filtration Techniques	1	1	3	8
Plant Nutrition and Fertilization Programs	2	1	1	8
Plant Protection and Pest Management	5	1	1	8
Geographical Information System ( GIS)	9	3	3	2

# Laboratories Equipments (Soil, Water & Microbiological Labs Weather Station)

- Tender Opening was Done in Beirut on 16 September 2005
- Prevision of Equipment reception Between February and March

## Sustainability in Experimentation, Applied Research & Extension Services

- Since 1995 LRA Make has Contacts with all Lebanese Agriculture Faculties to reach this Objective.
- 3 Engineers, 8 Technicians are Recruited for IRWA Project and Trained to Continue after the end of the Project. Four others technicians will Follow.
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# Rehabilitation and Annual River Bed Maintenance Sustainability

- LRA has Execute Before IRWA Project 2 Steps on Rehabilitation Works on Litani River Bed. These Works will continue Every time if Necessary.
- LRA has the Government Authorization, since June 2003, to Maintain Litani and Effluents River Beds. Before it is the Responsibility of Ministry of Energy and Water.
- One Technician and 3 Drivers are recruited by LRA and Trained by IRWA for the Sustainability of these Works.