



**IRWA Project**  
**Improvement of Irrigation Water  
 In Lebanon and Jordan**

**Main Objectives & Works  
 in LEBANON**

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 LITANI RIVER AUTHORITY - LEBANON

Kherbet Qanafar  
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## Rural Development Department Sections

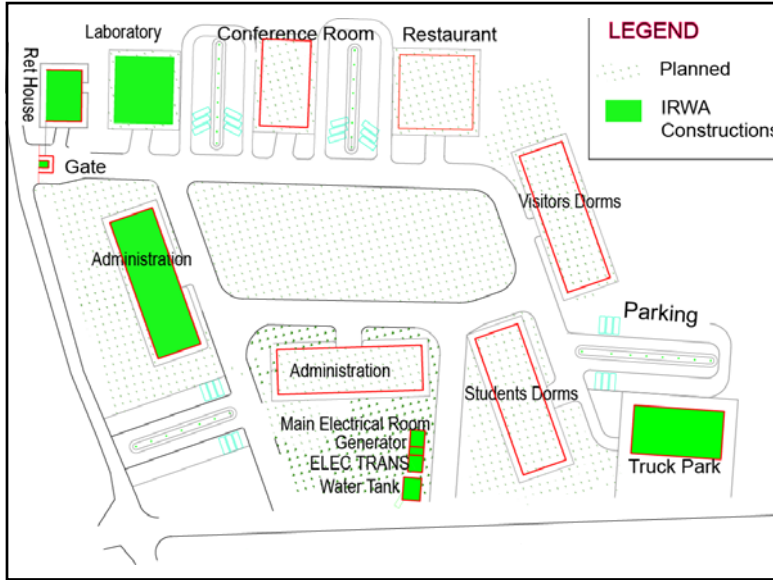
- Land and Water
- Agricultural and Economical Studies
- Experimental and Extension
  - Lebaa (7 ha): Biological Production
  - **Kherbet Qanafar :**
    - Experimental Field : 160 ha
    - Laboratories: Soils, Water, Phytosanitary, Bacteriological ( IRRIQUAL) and Food Safety : To be Equipped.

## Kherbet Qanafar Services Center

- Center on Irrigation Matter at National Level:
  - Experimentation
  - Applied Research
  - Capacity Building
  - Extension Services
- Area field : 160 Hectare
- Litani River Bed Maintenance

## IRWA Objectives

- Construction of a part of Kherbet Qanafar services Center.
- 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)

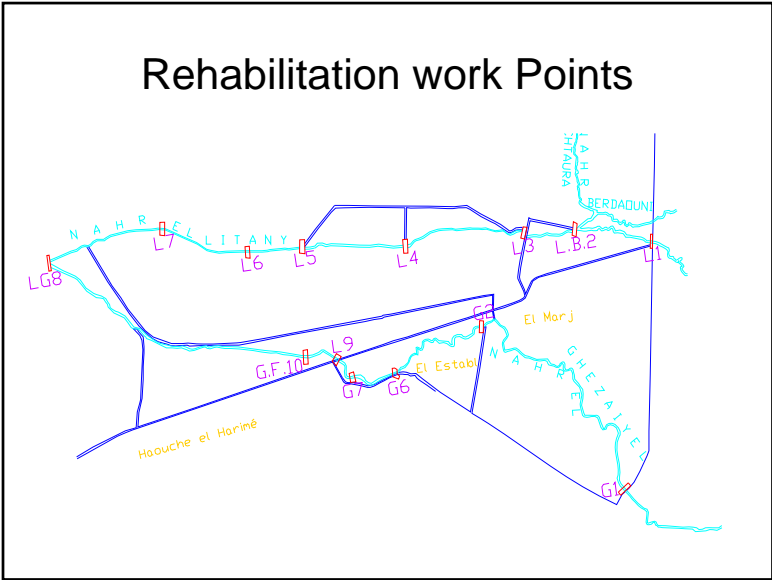


### Kherbet Qanafar Constructions Center

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



- ### 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:
    - 6 points are already rehabilitated
    - 1 point will be executed in 2007



## Litani & Effluents River Beds Maintenance –

- Received Machinery
  - Long Reach JCB JS 220 LR (MODEL 2005)
  - JCB ROBOT 1110 HF (MODEL 2005)
  - Truck (DAF) TYPE LF55-180 (MODEL 2005)
- Personnel Training on Cleaning Works on Litani River Bed and Effluents



## Executed Cleaning Works on Litani & Effluents River Beds – LRA Works

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

## Demonstration Plot

- Plot Delimitation (20 ha)
- Cropping Pattern Defined for 2007-2008
- Irrigation Equipment purchased

## Laboratories Equipments

Flame Atomic absorption
UV/Vis Spectrophotometer
Water distiller deionizer
Water deionizer
Acid resistant hood
pH, mV, Temperature meter

## Laboratories Equipments

Conductivity, TDS, Temperature meter	Blender
High Precision Balance	Hydrometers
Precision Balance	Vortex Mixer
Orbital Shaker	Infiltration Cylinder
Drying oven	Incubators
Digestion Apparatus	Refrigerated incubator
Refrigerated Centrifuge	Vertical Floor Standing Autoclave
Furnace (for organic matter)	Laminar flow Hood
Sieves (for soil preparation)	Colony counter

### Laboratories Equipments

Water Bath	COD Apparatus Complete
Bunsen Burner	Turbidity meter
Precision Balance	Dissolved oxygen gauge
Hot Plate Stirrer	Refrigerator
Binocular Microscope	Vortex Mixer
Portable pH meter	Micropipettes
Benchtop pH meter	Stereomicroscope with trans illuminating base
Conductivity, TDS, Temperature meter	Microscope for transmitted light brightfield, Phase contrast, darkfield and Polarization Trinocular with camera for photo and monitor
BOD Apparatus Complete	

### Laboratories Equipments

Compound microscopes with eyepiece micrometer and eyepiece pointer	Variable volume micropipette Capacity : 100 –1000 µl
Analytical balance	Hot Plate Stirrer
Benchtop pH meter	Water distiller deionizer
Freezer	<b>FURNITURE</b>
Laminar Flow Hood	Furniture type 1 (see the technical specification )
Personnel, Product, environmental, Protection	Furniture type 2 – 3 – 4 – 5 (see the technical specification )
Ice Flaker	
Variable volume micropipette Capacity : 0.5 – 10 µl	
Variable volume micropipette Capacity : 10 – 100 µl	

### Weather Station

Rain Gage	Relative Humidity Sensor	Air Temperature Sensor
Wind Speed Sensor	Rain Gage	Relative Humidity Sensor
Wind Direction Sensor	Wind Speed Sensor	
Solar Radiation Sensor	Wind Direction Sensor	
Barometric Pressure Sensor	Solar Radiation Sensor	
Soil Temperature Sensor	Barometric Pressure Sensor	
Measurement and control electronics	Soil Temperature Sensor	
Memory Card and Software (see the technical specification)	Desktop Computer	
Air Temperature Sensor		

- ### Agreement with Agriculture Faculty of Lebanese University
- Campus for students in an area of about 50.000 M2
  - Constructions: about 10.000 M2 including dorms and restaurants
  - Experimental field : 20 HA
  - Cow Farm
  - Food processing

Tanks Again