What are the main hazards to groundwater for Jeita spring ?

The area experiences a rapid and uncontrolled development.. However, wastewater is until now not collected and treated. **Wastewater is the main pollution source** and Jeita spring has been severely affected by microbiological contamination since many years.
The German Government is financing an important wastewater project in the Jeita catchment, which is closely linked to the BGR project.

Discharge of Untreated Wastewater into Nahr es Salib at Hrajel

How can the water resources be managed more effectively in the Jeita catchment ?

Snow is the most important source for groundwater recharge and thus is the lifeline of Lebanon. Large quantities of surface water and groundwater are running off unused to the sea.

At the same time the water supply in the Greater Beirut area often experiences a large deficit at the end of the dry season. Means have to be found to store ground and surface water and use it when needed.
The project has established a water balance using WEAP (Water Evaluation and Planning System). This enables the Lebanese government to decide which of the proposed options to implement.

Proposed Artificial Recharge and Storage Dams

Contact:

Federal Institute for Geoscience and Natural Resources

Dr. Armin Margane
Project Team Leader
St. Roche St.,
Raifoun, Keserwan
LEBANON
phone: +961-9-957348
mobile: +961-70-398027
email: armin.margane@bgr.de

Council for Development And Reconstruction Lebanon

Eng. Ismail Makki
Director of Planning Department
Council for Development and Reconstruction
Tallat al Serail
Beirut (BCD)
LEBANON
phone: +961-1-980096
ext.107/569
email: ismailm@cdr.gov.lb

Project Activities

Protection of Jeita Spring

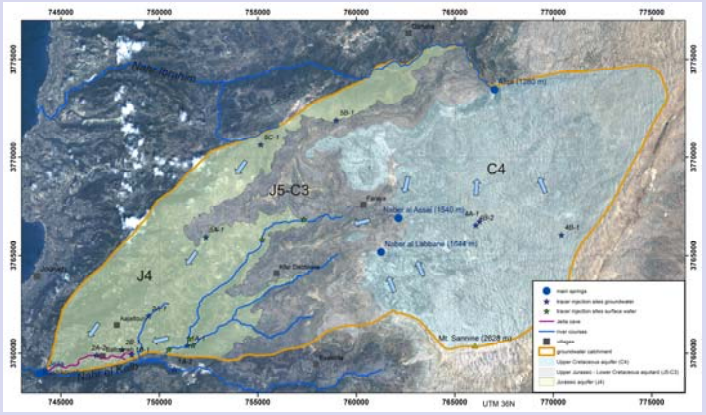
Project funded by the German Government

Federal Ministry for Economic Cooperation and Development

Why is our drinking water so polluted ?

About 70% of drinking water for Beirut comes from Jeita spring. This drinking water comes from groundwater stored in limestone aquifers. The limestones are highly affected by a process called karstification. Karstification creates pathways for rapid infiltration of water but also of pollutants. Because of the steep topography, flow velocities in groundwater are extremely high and transfer of pollution is immediate. Any oil spill or wastewater infiltration in this karst will reach our drinking water within short time. Jeita spring can only be protected by implementing groundwater protection zones and restricting landuse. All wastewater must be collected and treated.

The Jeita catchment can provide enough water for the Greater Beirut area and the water at its source has an excellent quality. It is on its way to the spring that pollution happens. It is more sustainable to invest in protection of these precious water resources than in treatment or conveyance of other more faraway resources to Beirut. It is not too late to act !



Groundwater Contribution Zone of Jeita Spring (orange line; identical with protection zone 3)

What is the project doing to protect Jeita spring ?

There are four major lines of intervention by which the project is aiming to achieve a better protection of the groundwater resources:

1) We give advice to all institutions and foreign donor agencies working in the field of planning for wastewater facilities in the Jeita/Nahr el Kalb catchment.
2) We delineate groundwater protection zones for Jeita spring and other important water resources used for drinking purposes
3) We collect all basic data related to water quantity and quality. Realtime monitoring systems will enable the Water Establishment to act in case of pollution peaks at individual water sources.
4) We propose measures to improve water resources management in the Jeita/Nahr el Kalb catchment.

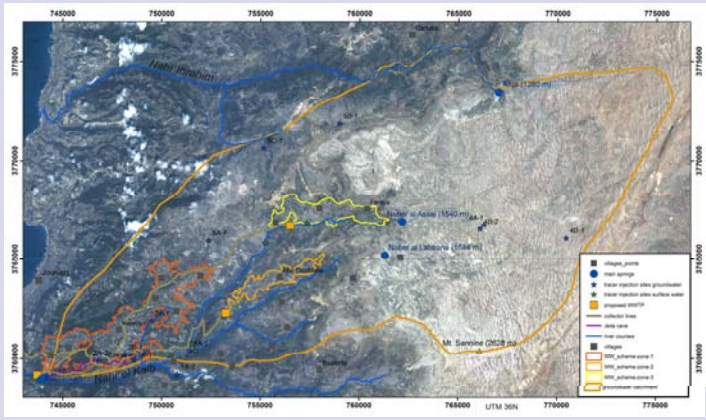
Which concrete project output can be expected ?

The project has assisted the Council for Development and Reconstruction (CDR) in establishing a **Wastewater Master Plan** for the Jeita/Nahr el Kalb catchment and to select the best options from the perspective of groundwater protection for site selection of collector lines, treatment plants and effluent discharges. An environmental impact assessment will jointly be prepared, where the project covers all geoscientific aspects (geohazards and impacts on water resources). Because there was no guidance existing for such projects, the project prepared a **Guideline for Environmental Impact Assessments for Wastewater Facilities in Lebanon**.

The project is in the process to delineate **ground-water protection zones**. Restictions concerning all major landuses which could potentially pollute the groundwater resources, i.e. Residential areas (wastewater), commercial and industrial sites, gas stations, quarries, farms and other hazardous activities, will be defined.

The Water Establishment can view realtime water quality and quantity monitoring information at the Dbaye drinking water treatment plant and control the use of all individual water sources accordingly.

A water resources balance has been established by the project. Water resources management options, how to use the water more effectively are being proposed. This especially pertains to water storage options (recharge and storage dams) and the conveyance of raw water from the source to the treatment plant (Dbaye).



Proposed Wastewater Schemes in the Jeita Catchment