

Tuesdays of LEWAP

Research and general public meeting

Minutes of the Meeting, Tuesday 3rd of September 2019



Understanding groundwater from sources to users

Dr. Joanna Doumar: Assistant Professor of Hydrogeology, Department of Geology, American University of Beirut

Dr. Naji Kehdy: Researcher and lecturer in Water Science, Lebanese University

Dr. Samir Zaatiti: Hydrogeologist, Research and Studies on Groundwater, Retired from Lebanese University

Dr. Farid Karam: Head of Water Resources Management and Engineering Division, ELARD Group

MAIN POINTS DISCUSSED



- The conceptualization of contaminant flow and transport in underground karst is essential for sustainable management of water resources and preservation of these resources.
- There is heterogeneity within the karst regarding the recharge and flow.
- Flows durations are short and the attenuation of contaminants is relatively slow.
- **Karst erosion and alteration** allow water accumulation underground forming the groundwater resources. However, **faults and fractures** play a complimentary role in water distribution and formation of rivers.
- **Water vulnerability** is defined as intrinsic sensitivity to contamination; this vulnerability depends on the flow and transport processes.
- Sensitivity to contamination depends on the underground geometry of the aquifer and the type of infiltration and recharge.
- **Quality** of groundwater depends also on climatic parameters; in periods of precipitation micro pollutants are diluted.
- **Some laws and regulations for water protection and preservation are not based on scientific criteria** (example distance between a well and a water source). Some laws are imported from abroad with being adapted to the Lebanese context (example of the regulation regarding mineral extraction).
- Wells which are used for irrigation purposes can be very deep and can have a negative impact on the quality and quantity of water sources even if the legal distance between the well and the source is respected.
- **Climate parameters** affect replenishment of ground water resources. Researches underlined the fact the quantity of precipitation did decrease but the rainfall partners evolved. A large quantity of water is also lost due to runoff which is accentuated by the waterproofing of soils.
- Before the Lebanese Civil War, more metrological data were available. At that time, 187 weather stations were installed, with 150 operating reliably. Currently only 87 weather stations are installed and providing data (37 operated by Lebanese National Meteorological Service and 50 operated by Lebanese Agricultural Research Institute)
- It is essential to assess the **Snow Water Equivalent** in order to determine quantity of groundwater resources.

MEDIUM OF PRESENTATION



Figure 1: Speakers from left Dr. Samir Zaatiti, Jasmine El Kareh, Dr. Najji Kehdy, Dr. Farid Karam and Dr. Joanna Doummar

Characterization of the flow and transport in the karst at the watershed scale: Applications on pilot cases in Lebanon – [Presentation of Dr. Joanna Doummar](#)

Scientific problems in legal text related to ecosystem and water protection in groundwater use – [Presentation of Dr. Najji Kehdy](#)

Water resources in Lebanon – [Presentation of Dr. Samir Zaatiti](#)

Assessment of aquifer recharge from direct rainfall based on existing data – [Presentation of Dr. Farid Karam](#)

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