

LEWAP Tuesdays

Research and general public meeting

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Characterization and monitoring of water quality in Lebanon

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MAIN POINTS DISCUSSED

- **Water quality** depends on climatic factors and anthropogenic activities
- **Agricultural runoff** is one of the major negative impacts on water quality in North Lebanon region mainly in Akkar plain contaminating surface water and groundwater; pesticides have been detected in Kadisha river and the groundwater along the river basin
- Signs of Polycyclic Aromatic Hydrocarbon (PAH) from combustion activities have been assessed in water quality measurements in the Abou Ali River basin in North Lebanon and traces were detected in groundwater as well.
- **Eutrophication** is a phenomenon that has been emerging in contained water bodies in Lebanon and is affecting the water quality; it is the result of nutrient inputs of nitrogen and phosphorus coming from sewage, fertilizers and detergents. This eutrophication has been exacerbated by increased temperatures and light.
- **Qaraaoun lake has been suffering from eutrophication for the past 3 decades** and this issue increased in severity in the last decade with summers becoming more hypereutrophic.
- **Chlorophyll-a** is an indicator of eutrophication that can result in deterioration of water quality if nutrient discharge is not managed.
- **Microbiological pollution and contamination** is detected in groundwater ranging from 0 to 600m – above 600m the water quality improves gradually
- **Salt water intrusion** was detected in Akkar and Tripoli coastal aquifers. Test results conducted on Tripoli coastal waters showed to be heavily contaminated by hydrocarbons and contaminants from wastewater runoff sources.
- **Satellite imageries and remote sensing** are emerging methodologies to monitor and assess the water quality in surface water and coastal water.
- **In order to avoid further water quality deterioration**, there is a need for **stronger regulation and enforcement** on wastewater discharge and application of fertilizers and pesticides; some pesticides banned by WHO are still being used in some agricultural plains
- **Farmers** should receive further educational programs related to their agricultural practices and handling of pesticides and fertilizers
- **Effective construction and operation** of wastewater treatment facilities is required to reduce surface and groundwater contamination from households and industries.



Figure 1: Speakers from left Dr. Nijad Kabbara, Dr. Ibrahim Alameddine, Dr. Jalal Halwani and Dr. Yasmine Jabaly



Figure 2: Public attentive to the presentations

SUPPORTING PRESENTATIONS



Water quality assessment of the Kadisha 'Abou Ali' river basin, North Lebanon [Presentation of Dr. Yasmine Jabaly](#)

Characterization and monitoring of water quality in Lebanon – a review of theses at the Lebanese University [Presentation of Dr. Jalal Halwani](#)

Qaraoun reservoir eutrophication dynamics: assessing the role of climate and excessive nutrient loading [Presentation of Dr. Ibrahim Alameddine](#)

Monitoring water quality in the coastal area of Tripoli using high-resolution satellite data [Presentation of Dr. Nijad Kabbara](#)

DISCUSSION BETWEEN THE AUDIENCE AND THE SPEAKERS

With whom these data are shared and why are these information not published?

Data is shared with decision makers and beneficiaries of a project; due to the competitive aspect among academic institutions, some information is not published. The government should provide a platform for data sharing accessible to everyone.

Why are farmers still using banned and illegal fertilizers on their crops? Where is the role of the Ministry of Agriculture in controlling them?

There is a lack of agricultural awareness in Akkar plain, farmers are buying fertilizers and pesticides in cheap prices, handling them in an unsafely manner and overusing them on

their crops. There is minimal monitoring from the Ministry of Agriculture due to lack of technical personnel and lack of awareness provided to farmers on how to consume water and the product used. It is clear that agricultural runoffs are the main problem in water contamination in Akkar region.

What is the main cause of eutrophication in Qaraaoun Lake? And why are we still focusing on the Qaraaoun if it is heavily contaminated?

Municipal wastewater is the main cause of eutrophication affecting the water quality in the lake and this has been exacerbated by the increased temperatures due to global warming. It is not acceptable to leave the lake if it is heavily contaminated; take the case of Lake Eerie in the USA – the lake was suffering from excessive algal growth for the past 10 years which caused significant threats to the ecosystem and human health. A strategy was put in place to minimize the phosphorus disposal in the lake and the condition of the lake is improving gradually.

What can be used as a biopesticide?

Tambac has been shown to drive away pesticides and insects; one of the oldest technique used by our ancestors however not applicable currently.

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