

Water Resources Engineering Department MONTHLY SCIENTIFIC MAGAZINE

Editor in Chief: Shawnm Mudhafar Saleh

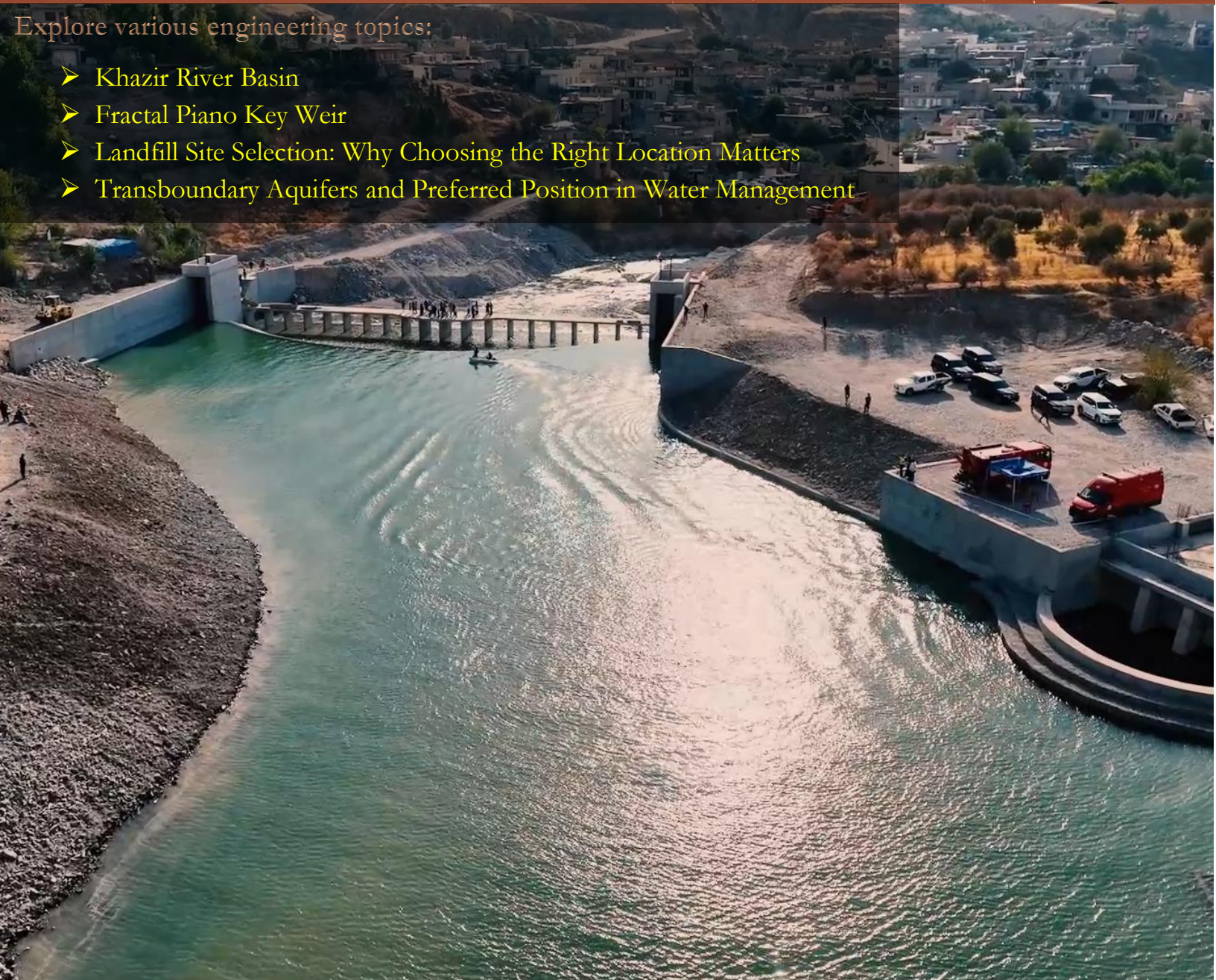
College of Engineering

Salahaddin University

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Explore various engineering topics:

- Khazir River Basin
- Fractal Piano Key Weir
- Landfill Site Selection: Why Choosing the Right Location Matters
- Transboundary Aquifers and Preferred Position in Water Management



To submit an article for publication with us, kindly get in touch through the following contact information

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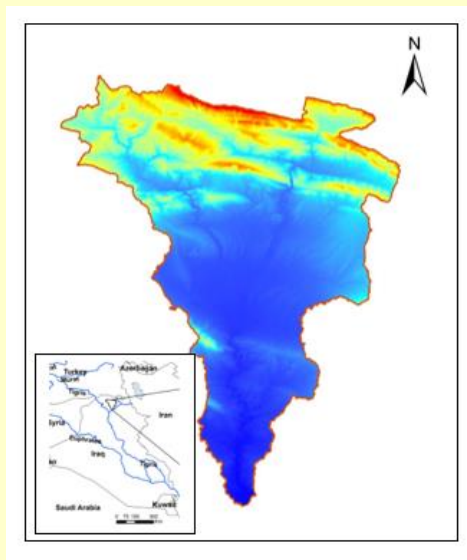


Abdulwahd Kassem

Lecturer

Khazir River Basin

Khazir River is tributary of the Greater Zab River, formed after the confluence of two small streams near Asmawa village; the first stream is coming from Chamanke region and the second one from Bakerman region. Khazir River joins near Bardarash Mountain with Gomel River, which comes from the Khanis region. The area of Khazir basin was about 3185 km², the geographic location is 43°14'00" - 43°44'25" E longitude and 36°22'00" - 36°52'33" N latitude. The maximum elevation within the area is 2165 meters above mean sea level (AMSL), and the minimum elevation was 216 AMSL close to the basin outlet in the south.



The basin divided into three regions depending on structural and geological aspects, the first region is the northern Aqre mountainous area; the second region is the broad syncline represented by a vast plain extending between Aqre Mountains to the north and Bardarash Maqlub Mountains to the south, and the third region stretches to the south of the Bardarash

Mountains. Land Use and Land Cover (LULC) of the basin was classified into five main classes: vegetated land, carbonate rocks, a fallow, conglomerate with sandstone, and urban land.



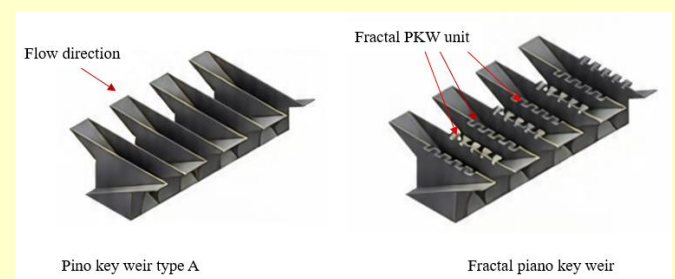
Tara Aurahman

Lecturer

Fractal Piano Key Weir

A fractal piano key weir (PKW) is created by placing a smaller-scale PKW unit on the crest of larger PKW spillway. It may be constructed from steel fabrication or glass-fiber materials to minimize material and construction costs. Due to their high hydraulic performance at low head, fractal PKWs an effective solution for regulating water levels in rivers, channels and lakes. Its implementations eliminate the need for gates or other mechanical components, which are often associated with maintenance requirements and substantial construction cost.

In addition, fractal PKWs show potential for application in wastewater flocculation tanks, where the very low flow velocities facilitate the settling of flocculated particles from suspension.



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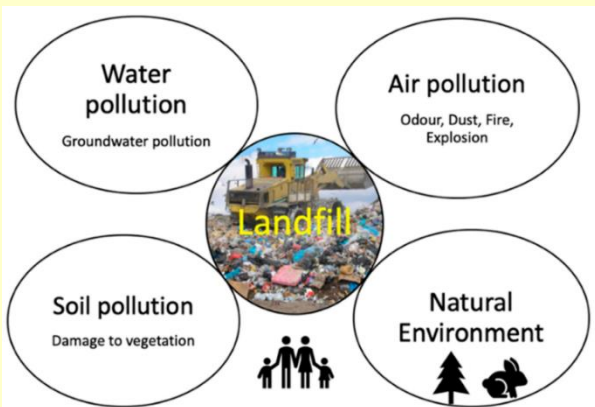
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Zhian Ahmed
Assistant Lecturer

Landfill Site Selection: Why Choosing the Right Location Matters

As cities grow and waste increases, selecting the right site for a landfill is more important than ever. A poorly placed landfill can pollute groundwater, create bad odors, and harm nearby communities. Engineers consider factors like distance from homes, soil type, land slope, groundwater depth, and road access. Sites with stable ground and natural protection against pollution are preferred. Tools like GIS and AHP make selection more accurate by mapping unsuitable areas and weighing key factors. Careful planning today keeps communities safe and reduces environmental problems for the future.



Rashad Hassan
Assistant Lecturer

Transboundary Aquifers and Preferred Position in Water Management

Transboundary aquifers make up a significant portion of the world’s groundwater resources and are shared by two or more countries. Because these aquifers extend across political borders, they require specialised approaches for assessment, management, and governance. Effective cooperation among the countries involved is essential to ensure that the aquifer is used sustainably and equitably.

The upstream part of a transboundary aquifer is usually more favourable for groundwater production, as it serves as the primary recharge zone. However, excessive pumping in the upstream area can create serious downstream consequences, including reduced water availability, contamination, declining water quality, or even depletion of the resource.

For this reason, successful management of transboundary aquifers requires strong collaboration, shared policies, and coordinated decision-making among all countries involved. Only through joint planning and mutual understanding can these valuable groundwater systems be protected for long-term sustainability.

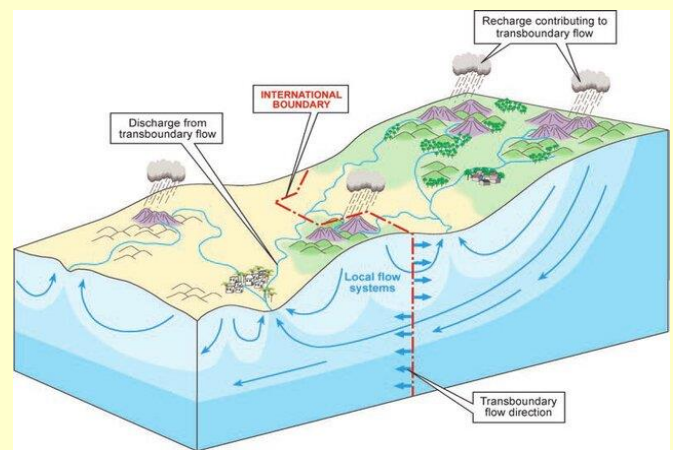


Figure 1. Schematic of a transboundary aquifer.

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