Potential of developing an irrigation project involving WH of NCWR in Al Humra Area

Presented by:

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Potential of developing an irrigation project involving WH of NCWR in the peer's region of work

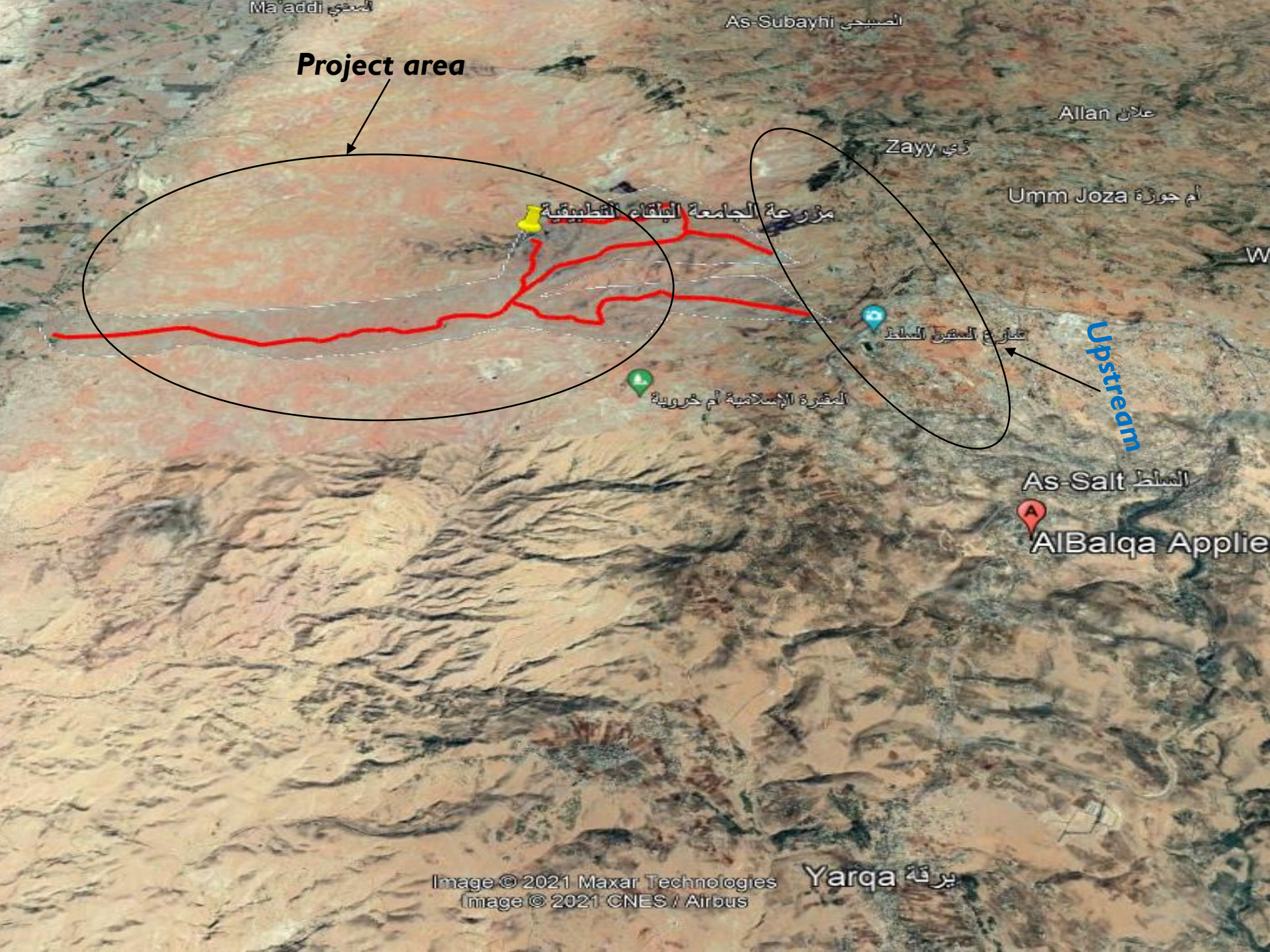
National Interests in WH Projects

- The importance of water harvesting has been recognized by the Government of Jordan as per the **National Water Strategy 2016-2025 & Water Demand Management Policy 2016.**
- The strategy and policy describe a number of goals and actions addressing the water supply-demand imbalance.
- Additionally, specific goal is included to 'promote the use of rainfall harvesting methods in irrigation projects'.

Catchment & Collection Area Characteristics

- Water harvesting in the watersheds in the project area is proposed to contribute to reduce the water gap and support local livelihood enhancement.
- This proposed project is dedicated to the integration of water harvesting as an integral part of water management and climate adaptation intervention in Jordan.
- Al Humra area, is considered one of the poorest areas in the country. A pilot site in this area which is Prince Tasnim Station for Agricultural Research of Balqa Applied University (BAU) was selected with a target of supporting BAU agricultural projects in the designated development zone.
- Soils are shallow and have high salinity and low permeability, as a result of the impediment offered by its clay layers (Source from National Master Plan for the Jordan River Valley, Prepared by Royal HaskoningDHV in partnership with: MASAR Center Jordan. April, 2015).
- Water availability was identified as one critical bottleneck for developing the target area.


Project area
Ma'addi المعدي
As-Subayhi الصبيحي
Allan علان
Zayy زي
Umm Joza أم جوزة
مزرعة الجامعة البلقاء التطبيقية
مزارع السقي السلط
المقبرة الإسلامية أم خروبة
Upstream
As-Salt السلط
AlBalqa Applie
Yarqa برقة
Image © 2021 Maxar Technologies
Image © 2021 CNES / Airbus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OBJECTIVE

- Reduce the water gap between the water demand and water could be supplied through the proposed project of **WH of NCWR.**

Description of the Application Area or Target

- Princess Tasnim Station for Agricultural Research of BAU is located about 15 kilometers north-west of Al- Salt and on the main road to the Jordan Valley;

- The station area is around 10,000 dunums.

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- The environment of the region has a unique biodiversity where the station starts from a height of 440 meters above sea level and extends towards the Jordan Valley to reach a height of 200 meters below sea level.

Description of the Application Area or Target

- The station has a wide range of cultivated species of productive trees such as: Acacia, Arabic Acacia, Terebinth, Oak, Carob, Robinia, Basswood, Cypress, Willow, Pine, Amber, Pepper Azure, Kina, Almonds, Nectandra Hihua and Washingtonia Robusta trees;

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- Furthermore, hundreds of wild plants are found at the station in addition to numerous cultivated species of vegetables and fruits.

Prince Tasnim Station for Agricultural Research of BAU

Criteria for Selecting the Application site for applying WH of NCWR Project

- Capability of using the most of NWRMs/NCWRs described at a single site.
- Efficiency of reducing flood risk and increase water availability in the catchment.
- Soils with high permeability to increase infiltration and relatively deep groundwater aquifer.
- Minimizing construction costs – increase environmental /biodiversity/ amenity profits.
- Least polluted runoff not to deteriorate groundwater quality.
- Added value to society and general public – social acceptance.
- Existence of adjacent receiving body for excess runoff discharge.

Methodology

- **Earth ponds** are one of the simplest methods of water harvesting. The design is simple and the calculations straightforward, and the ponds are relatively large in size (more than 50 000 m^3 in volume).

- The only machinery needed to develop earth ponds are **bulldozers and trucks** to dig the earth hole 4–5 m deep and up to 100 m wide. A smaller **earth pond** is usually also dug to trap the sediments from the water before it gets into the main pond, and a **diverting channel** carries the mud water from the wadi channel into the sediment trap.

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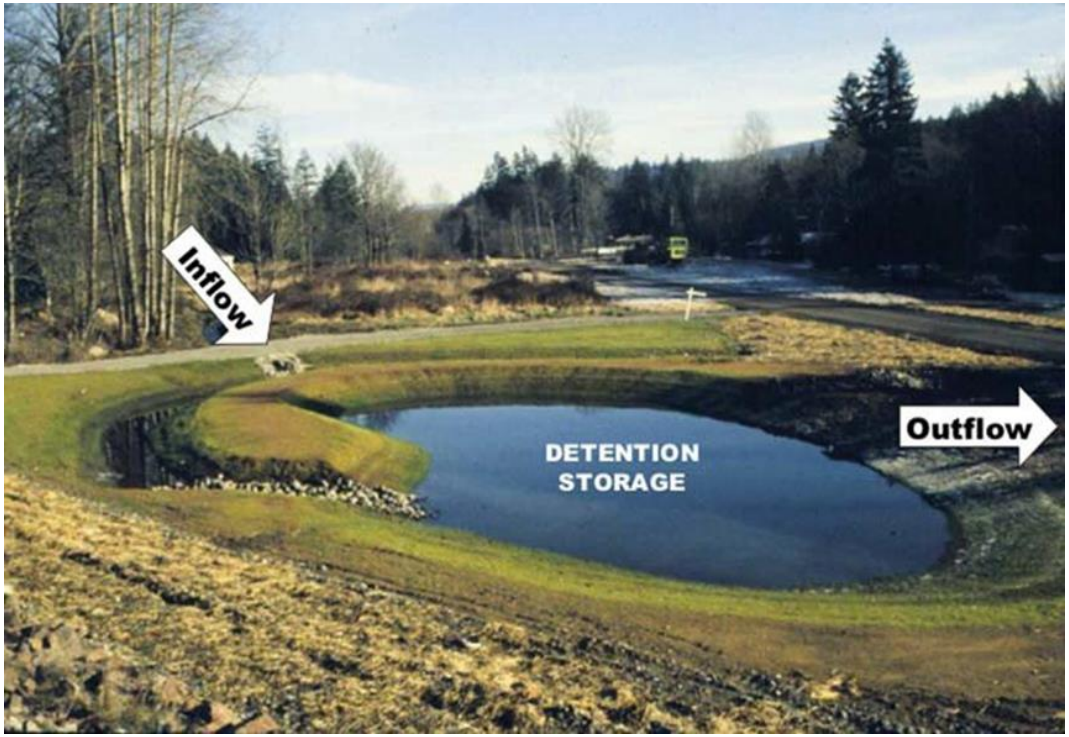

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Earth Ponds Structure as one of the methods of WH in the Application Area

This structure is considered as the **first water harvesting structure** in Al-Humra.

It plays multiple functions for the area:

(i) It stores winter rains, and supplies when additional water is most needed to irrigate agricultural land of the targeted beneficiaries in the area;

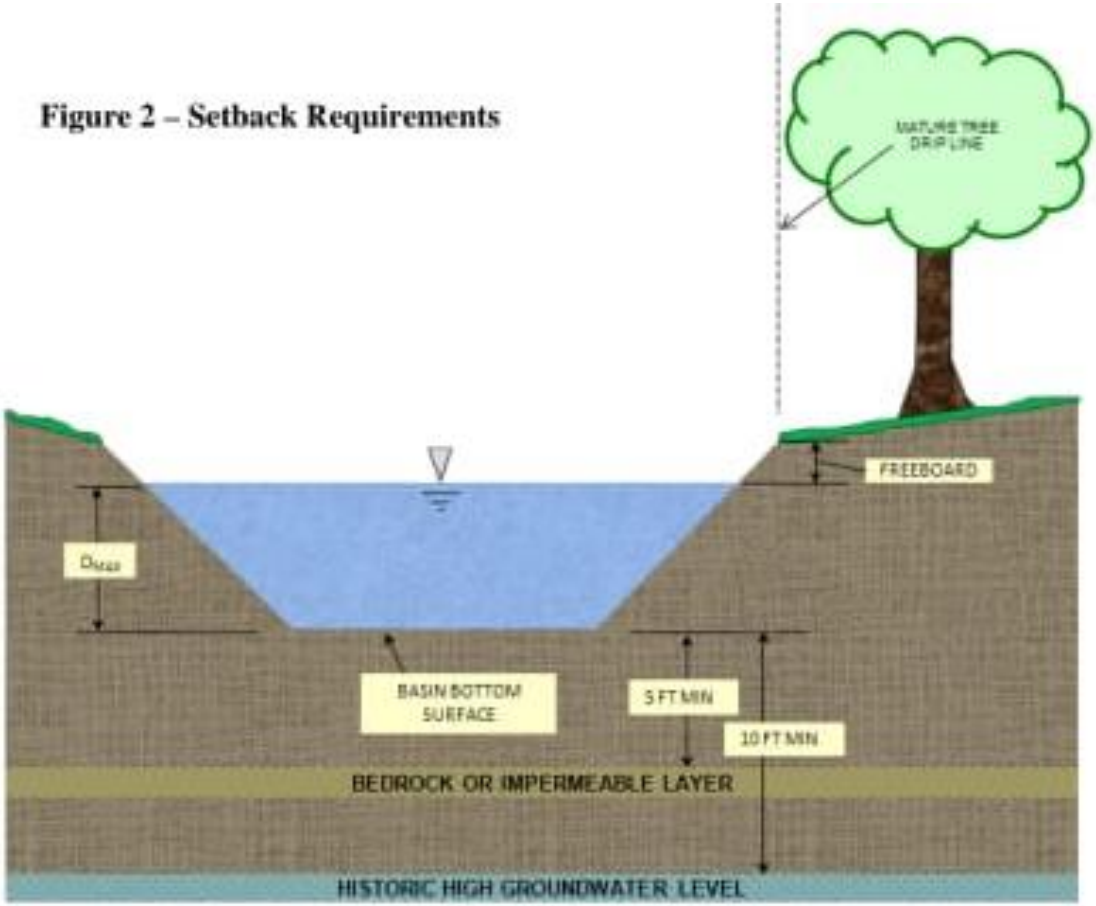
(i) Improve the quality of irrigation water in the area by increasing fresh water;

Additional Benefits of the Potential of developing a project involving WH of NCWR

- Reduce stormwater impacts and more potential to reduce drift and siltation;
- Contribution to climate change mitigation, protecting the local watershed, enhancing the soil-water retention capacity, reducing soil erosion, and land degradation and pollution;
- Positive environmental impacts that support the ecosystem services; improve the surrounding community livelihoods with access to better water quality;
- Contribute to the hydrologic cycle with both evaporation and groundwater recharge.

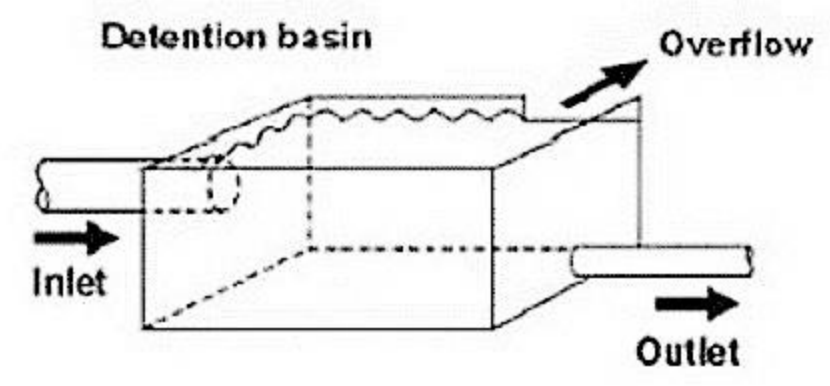
Other Structure in Question as a method of WH in the Application Area

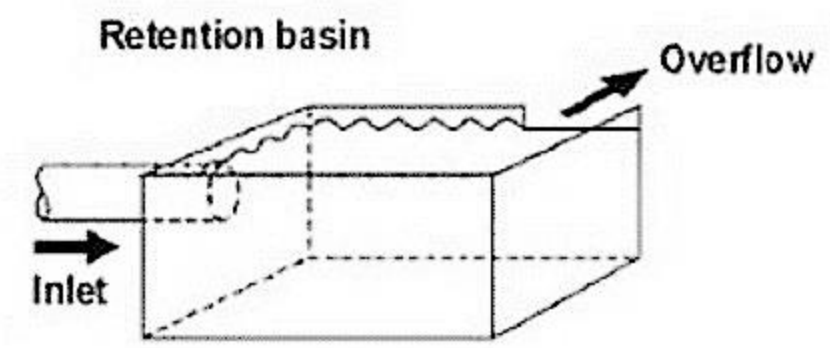
- **Infiltration Basins/ Artificial groundwater recharge**



Other Structure in Question as a method of WH in the Application Area

- **Retention and detention basins**





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- **Sediment capture ponds (check dams)**

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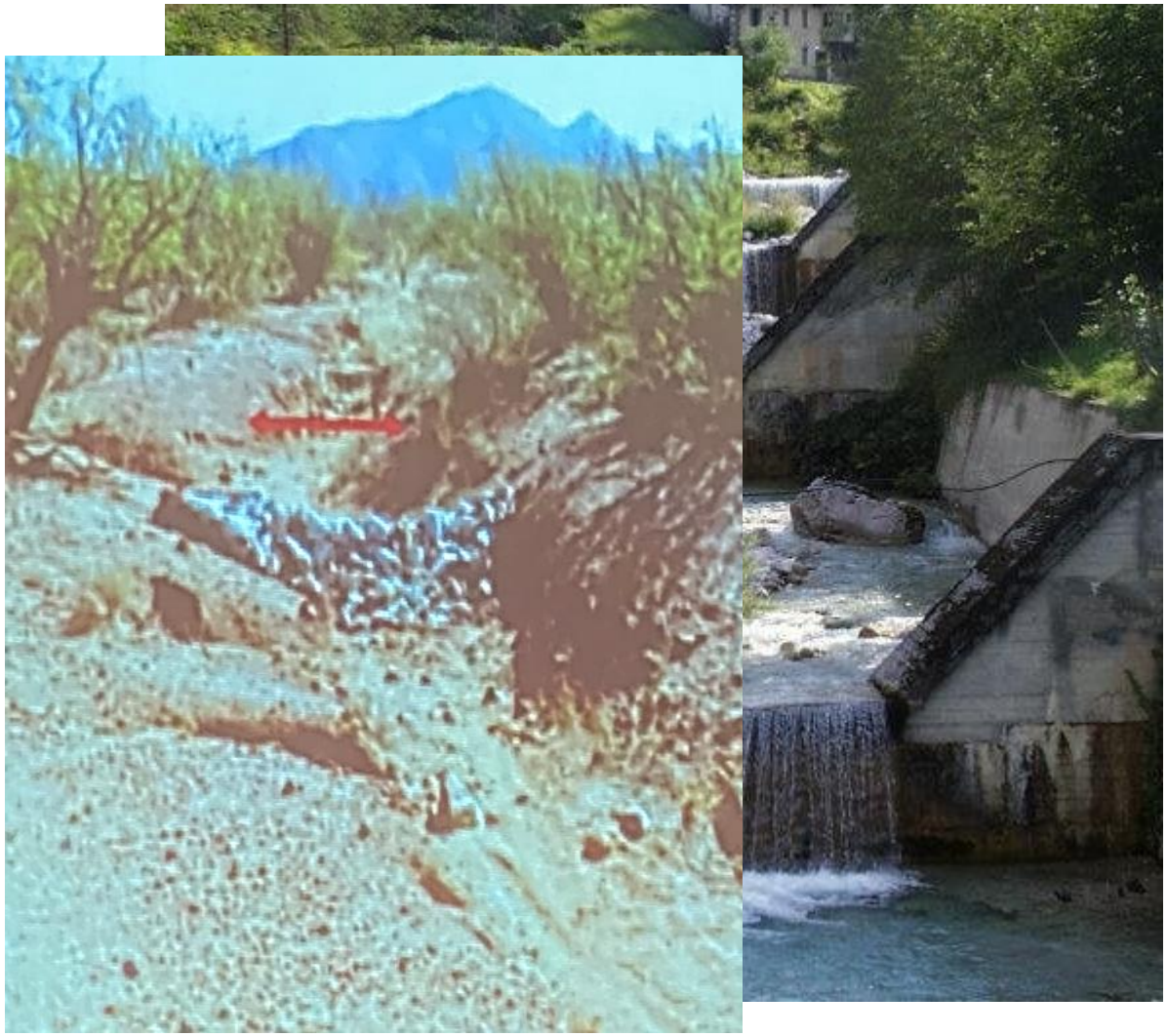

Other Structure in Question as a method of WH in the Application Area

- **Sand Dams**

- Dams exploit the effective porosity of the underlying sand to provide storage and to minimize evaporation losses.
- Below 60 cm depth, evaporation from sand is negligible.
- For effective porosity for medium sized sands (0.32), means that every 1m^3 of sand can retain up to 320L of water.
- The rest of the volume occupied by the sand particles would be lost to evaporation otherwise.

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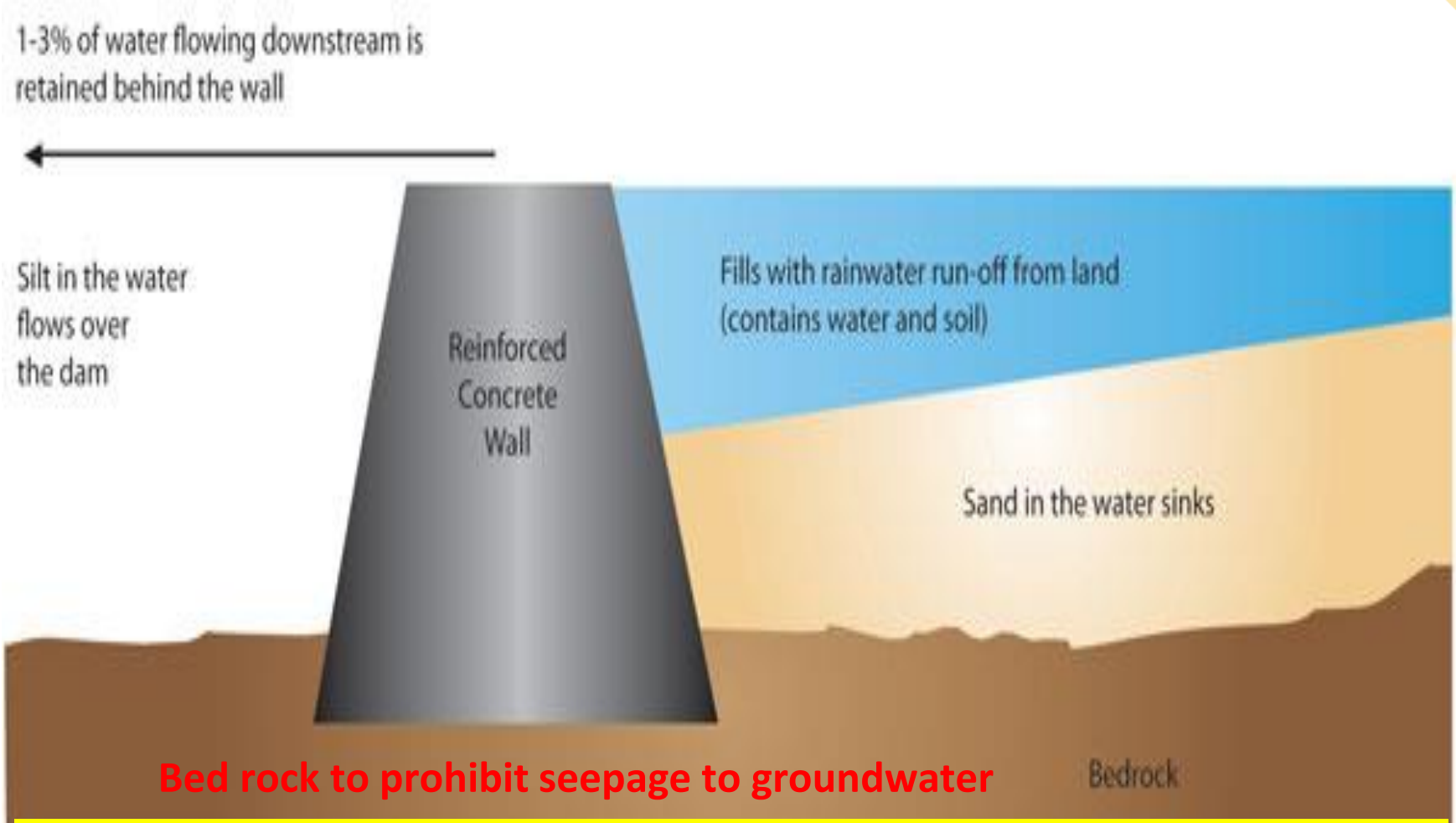

Sand dams: a sustainable solution for water scarce regions – International Water Power

Thank You for your attention