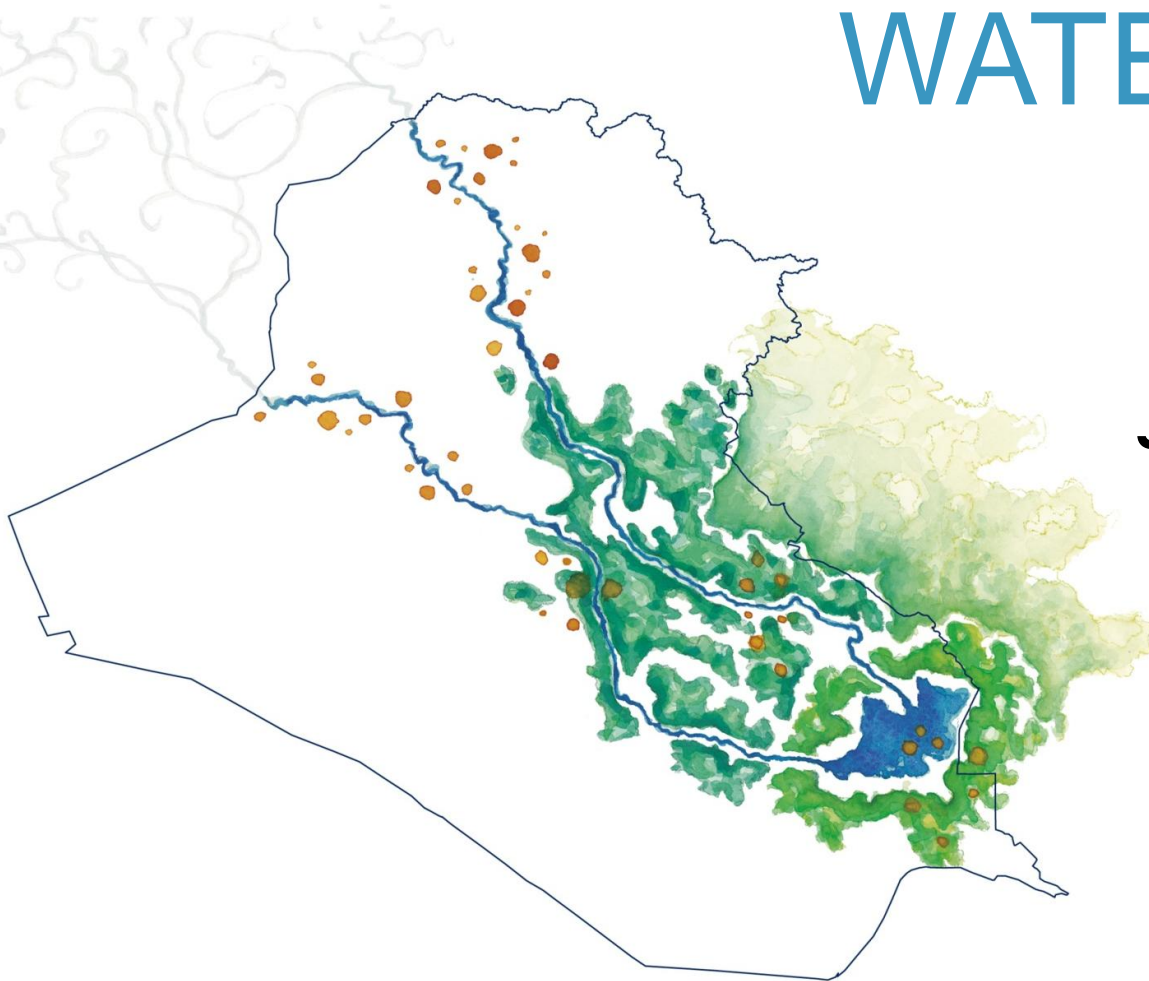




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# REUSE OF DRAINAGE WATER IN IRAQ



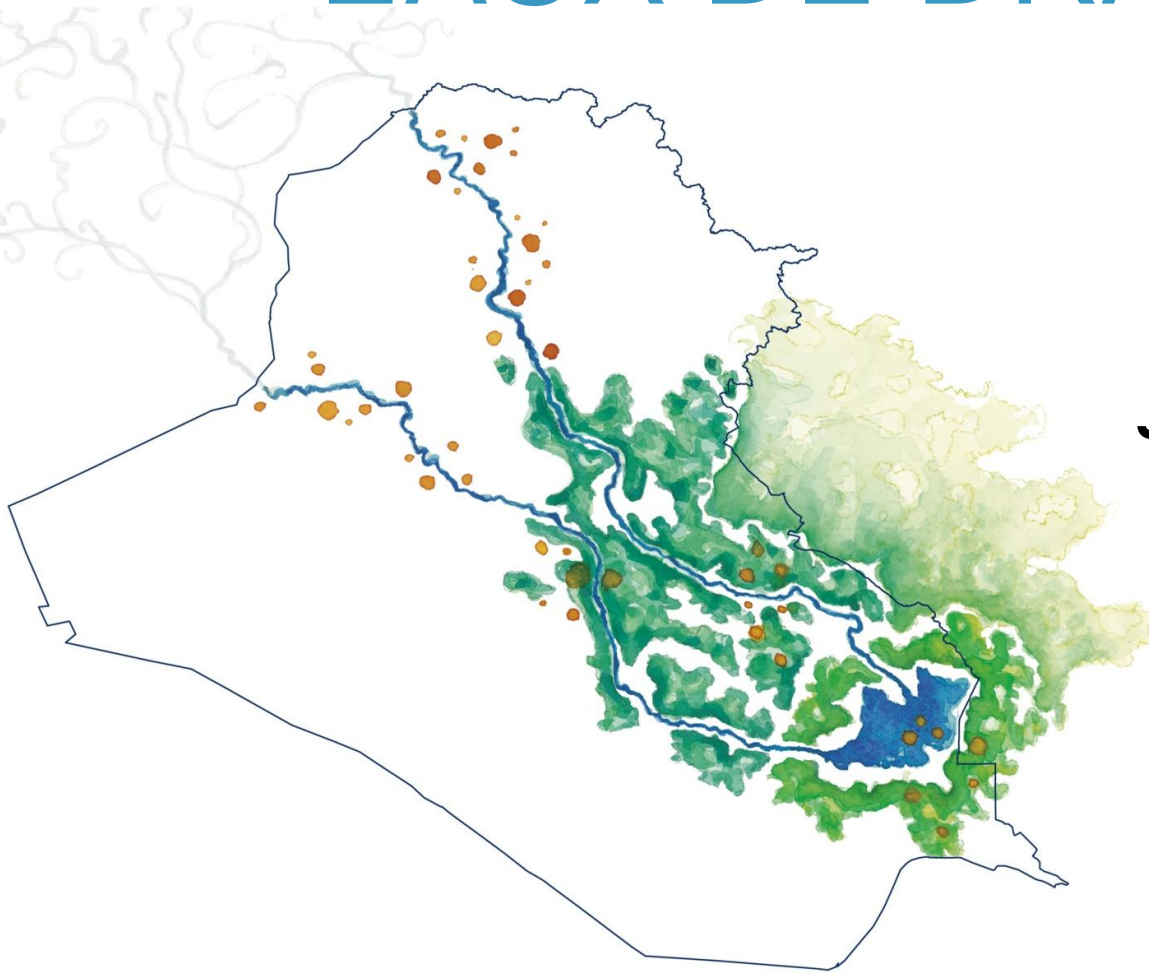
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# REUTILISATION DES EAUX DE DRAINAGE EN IRAQ



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# Presentation outlines

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- 1. IRAQ'S WATER SITUATION**
- 2. THE NEED FOR ACTION**
- 3. THREE OPTIONS FOR DRAINAGE WATER REUSE**
- 4. CONCLUSION**

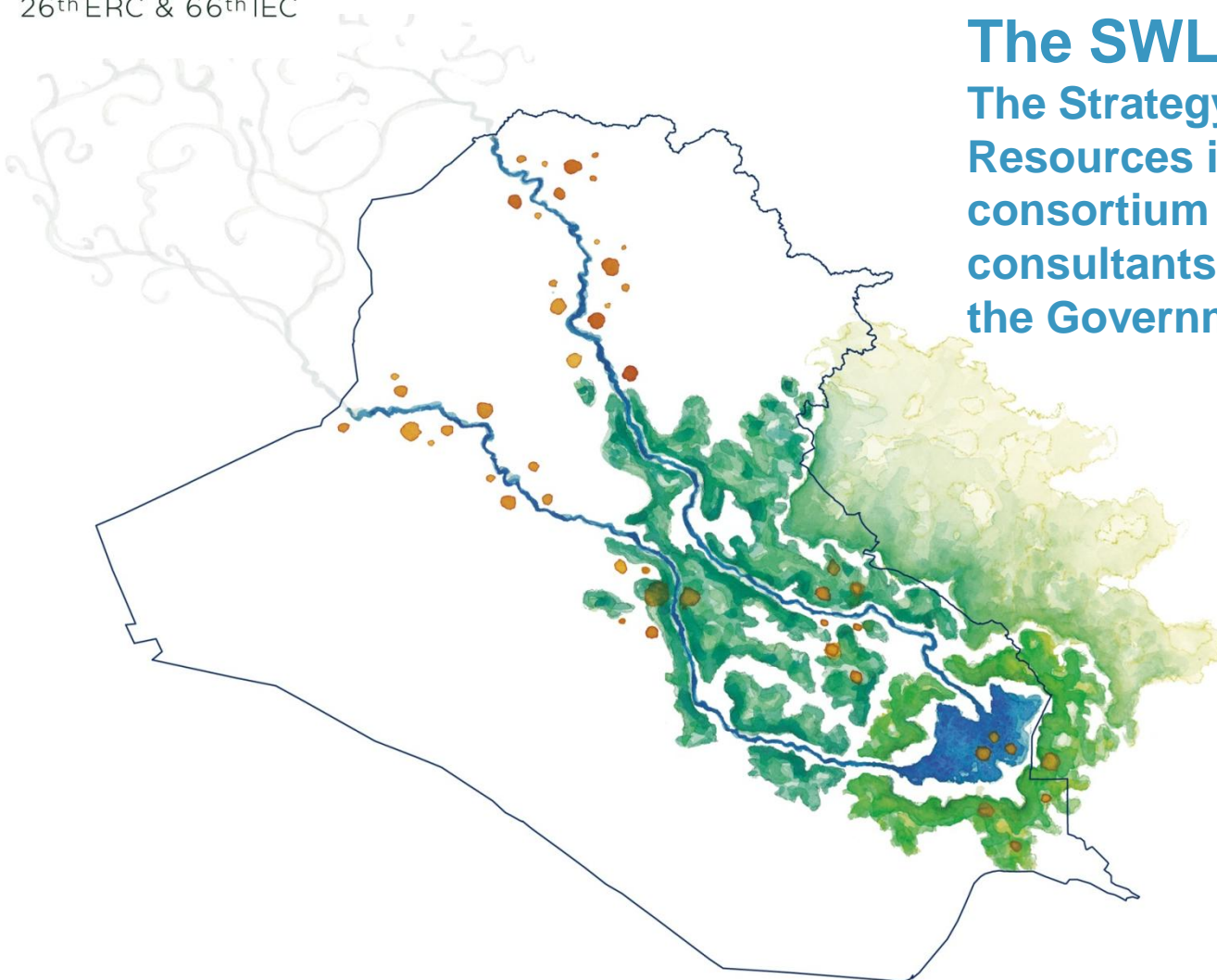


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# REUSE OF DRAINAGE WATER IN IRAQ

**The SWLRI Project:**  
The Strategy for Water and Land Resources in Iraq was realized by a consortium of International consultants from 2011 to 2014 for the Government of Iraq (GoI).





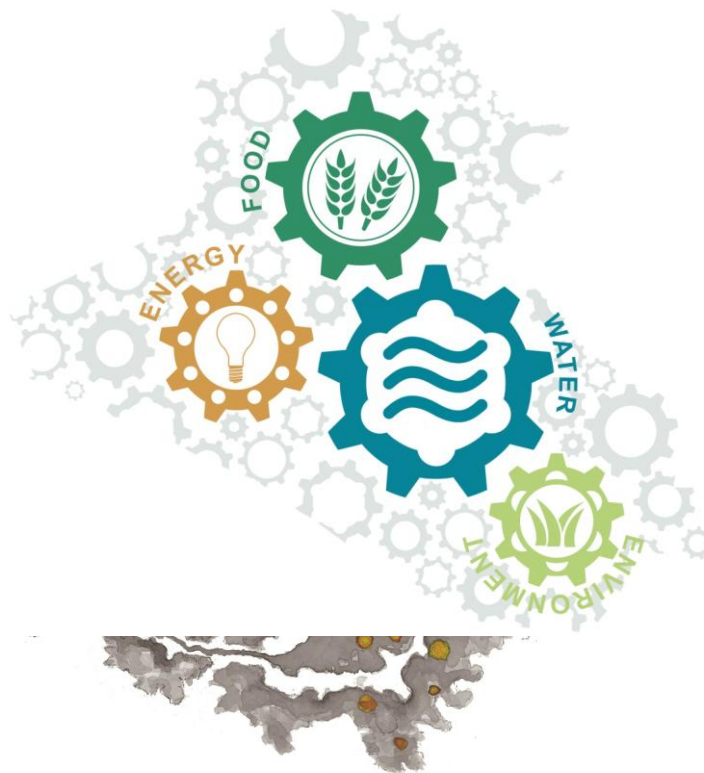
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# REUSE OF DRAINAGE WATER IN IRAQ



## Iraq's *Water-Food-Energy-Environment* Nexus



**The need for a delicate balance between competing water uses**

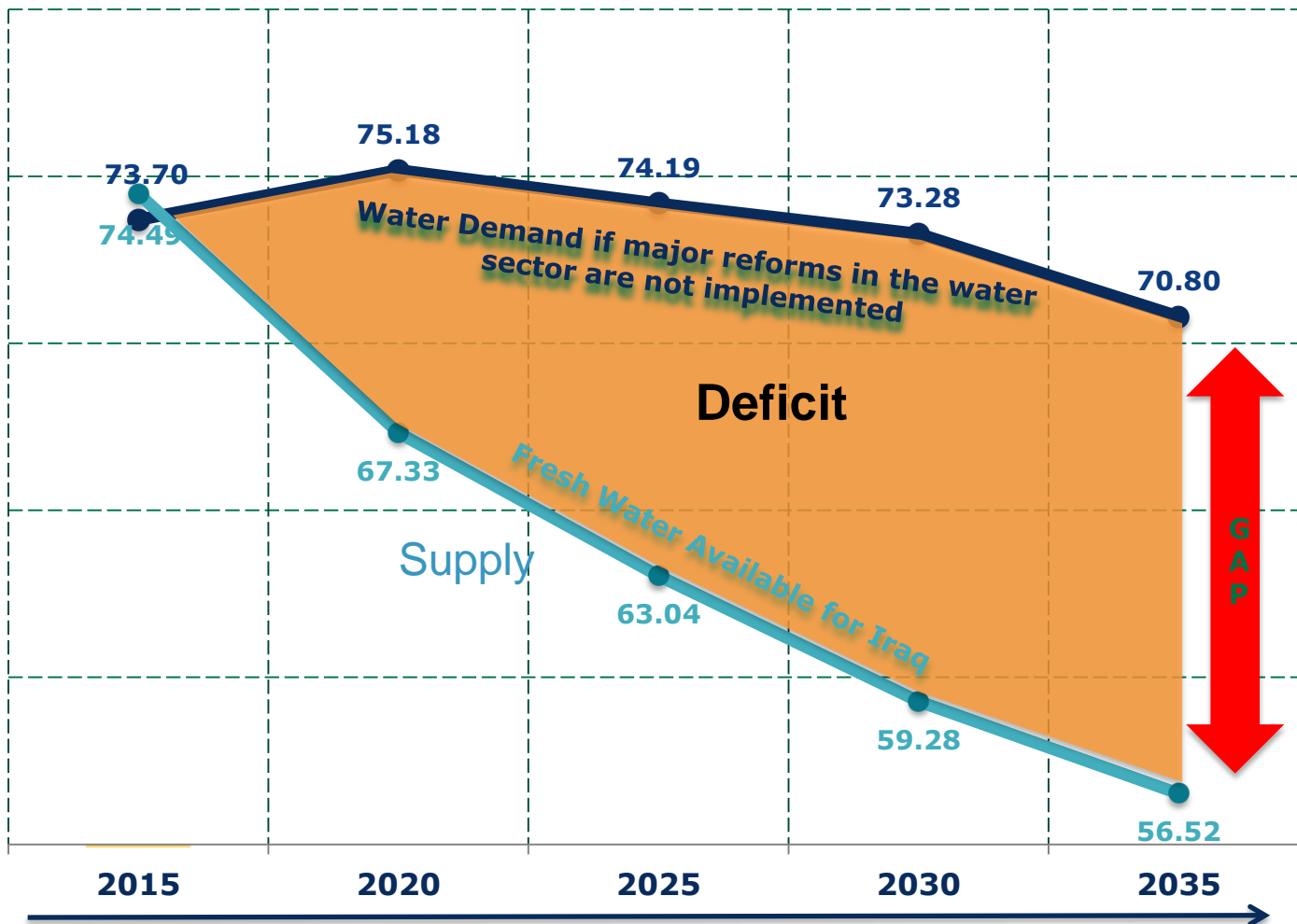


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# REUSE OF DRAINAGE WATER IN IRAQ

## A NEED FOR ACTION



The available surface water is projected to decrease by 17.640 BCM, or 24.5%, over the next 20 years



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# REUSE OF DRAINAGE WATER IN IRAQ

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## **The Need for Urgent action for:**

- feeding and providing energy for a growing population,
- combating drought and adapting to climate change,
- sustaining a healthy environment

 **The re-use of drainage waters was part of the strategy.**

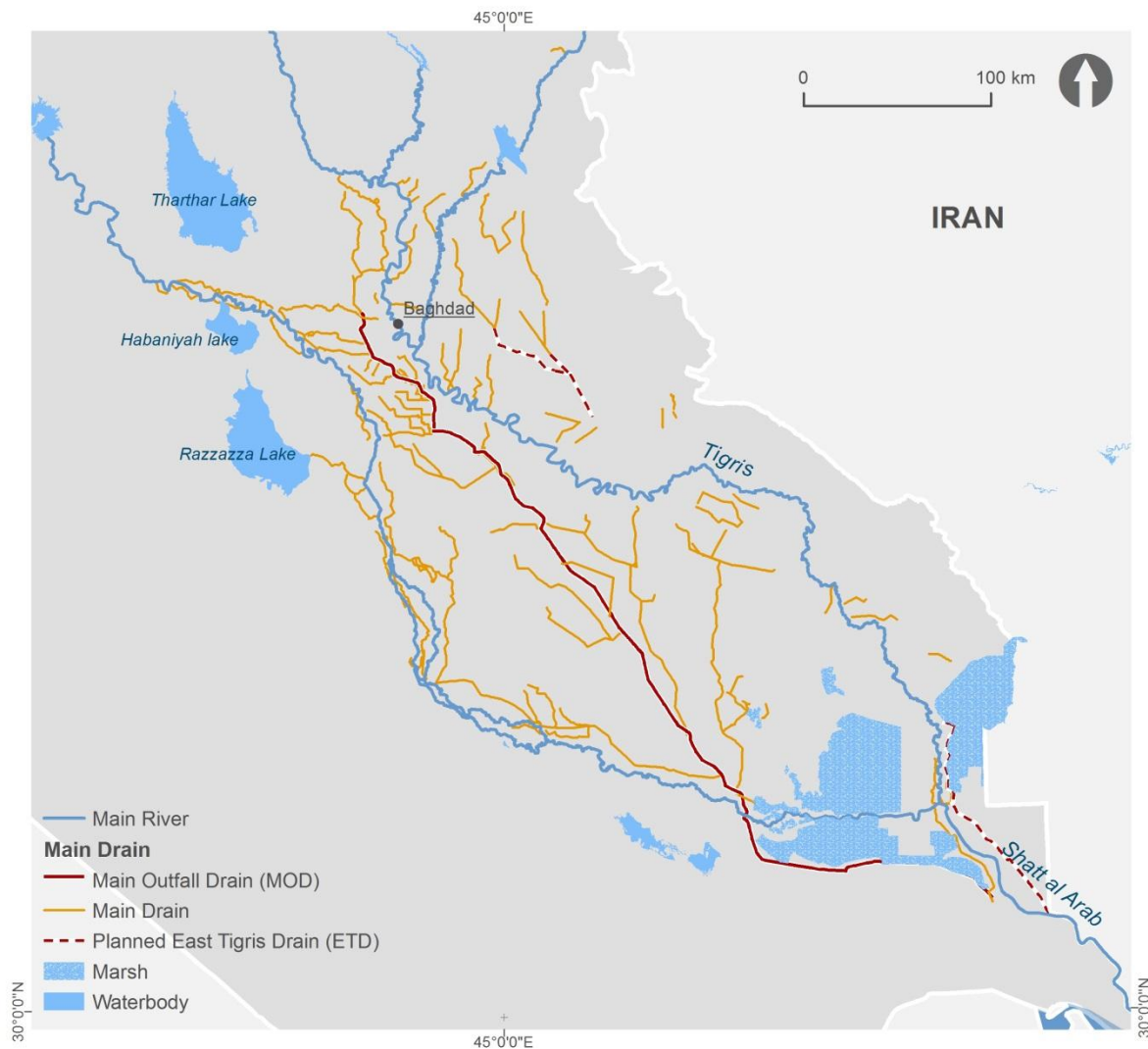


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# REUSE OF DRAINAGE WATER IN IRAQ

- Present water use in irrigation in Iraq is approximately 50 BCM/year
- Inefficiency of the Irrigation System
- Large parts of the irrigation water goes back to the river or goes to the MOD
- The MOD Collects 3,8 MCM per year
- In 2035, a total of 4.6 BCM per year will be collected and made available for reuse







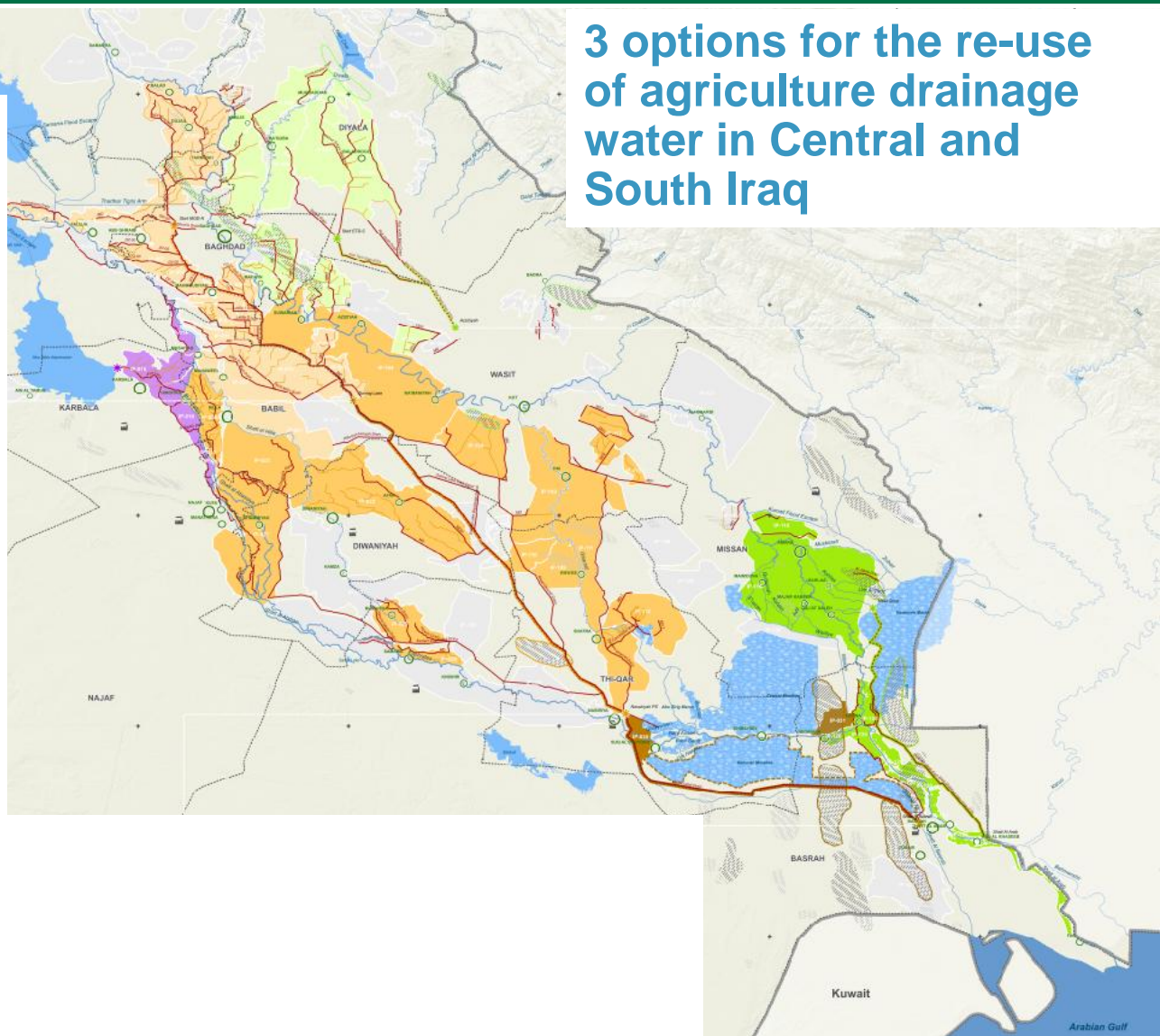
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# REUSE OF DRAINAGE WATER IN IRAQ

1. Provision of water for re-injection into the oil fields of southern Iraq;
2. Provision of water for the development of green belts around cities;
3. Augment the flow to Hammar Marshes and the Shatt al Arab (via the use of the water from the East Tigris Drain).

**3 options for the re-use of agriculture drainage water in Central and South Iraq**





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# REUSE OF DRAINAGE WATER IN IRAQ

## Option 1: Re-injection in the Oil fields



***1,5 Barrels of water to produce 1 barrel of crude oil***

In a water-scarce future Iraq, there is no justification to use freshwater to support oil production.

The country will have to rely heavily on the re-use of treated water to support the energy and industrial sectors.

The Strategy assumes that 69.2% or 1.227 BCM per year of the water needs for the oil industry will be provided by alternative sources of water. The cumulative need for the oil sector is 1.773 BCM/year (or 3.25% of the total available fresh water)

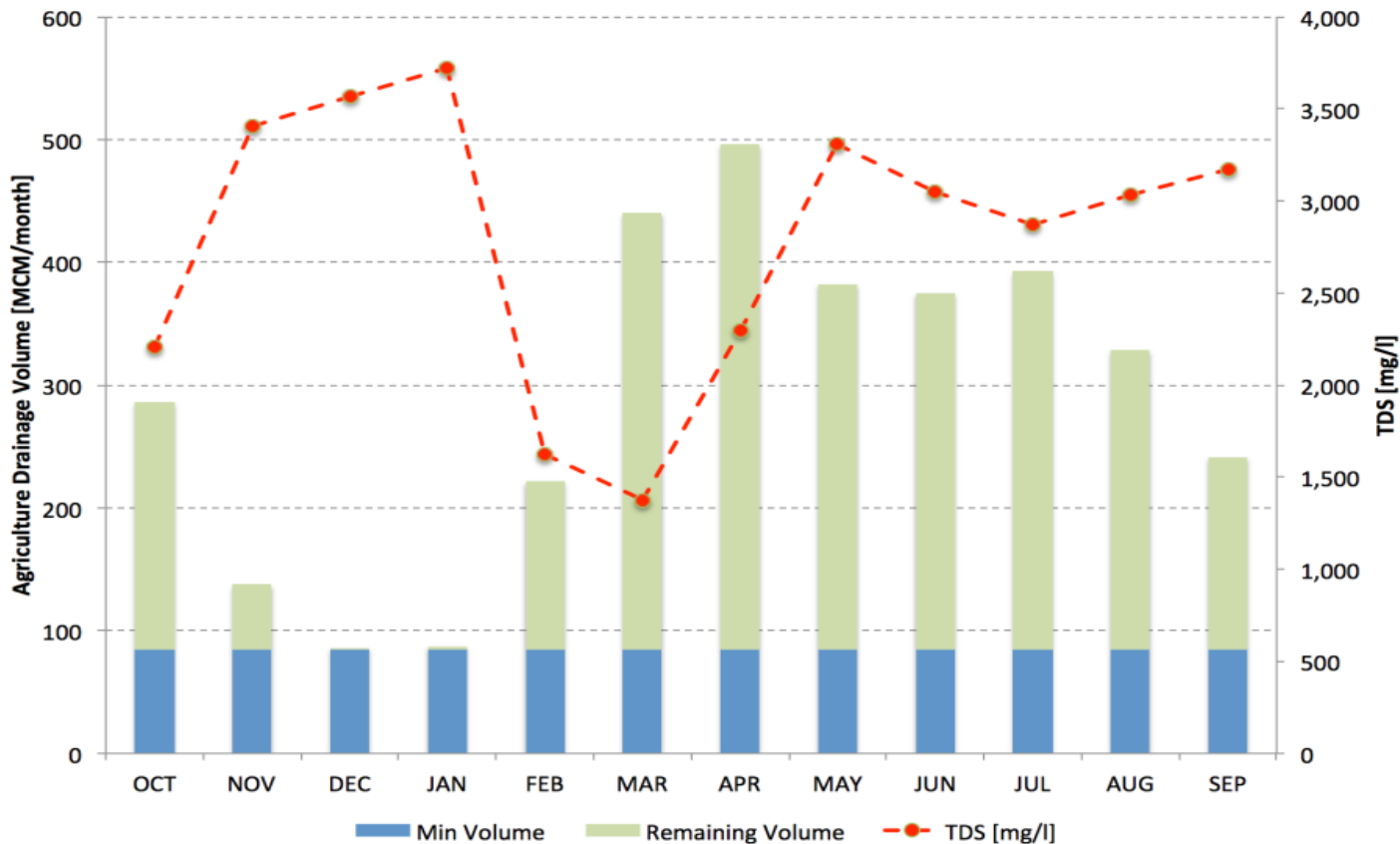


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# REUSE OF DRAINAGE WATER IN IRAQ

## Option 1: Re-injection in the Oil fields



*69.2% of the water needs of the Oil Industry in Central and South Iraq can be covered*



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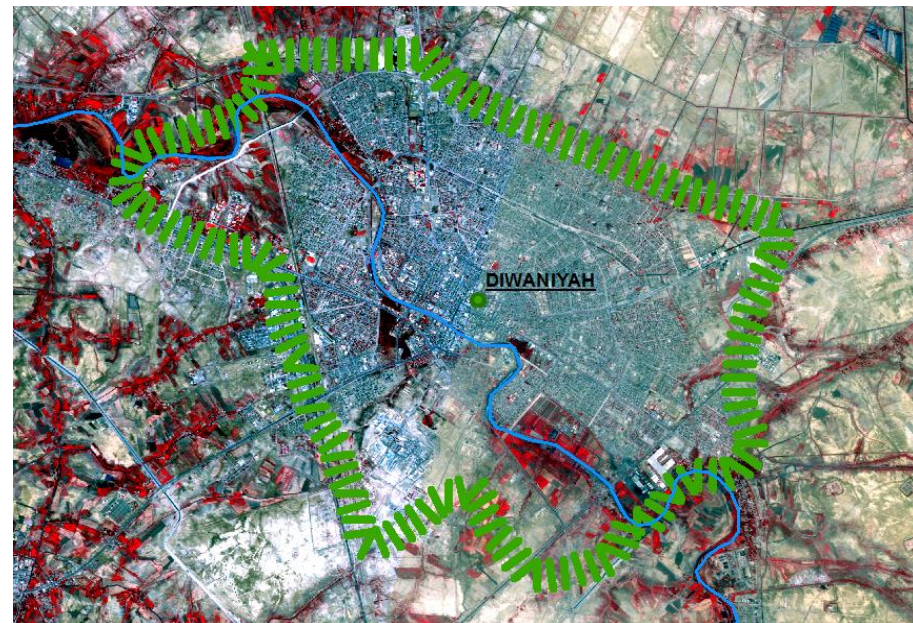
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# REUSE OF DRAINAGE WATER IN IRAQ

## Option 2: Green belts around the cities

Green belts have been proposed for development around cities. The objectives are:

- to mitigate the effects of wind erosion, thereby preventing desertification and reducing other negative impacts of dust.
- To provide shelter and habitat for wildlife, supporting biodiversity,
- To create a space that can be used for as parks for recreation.





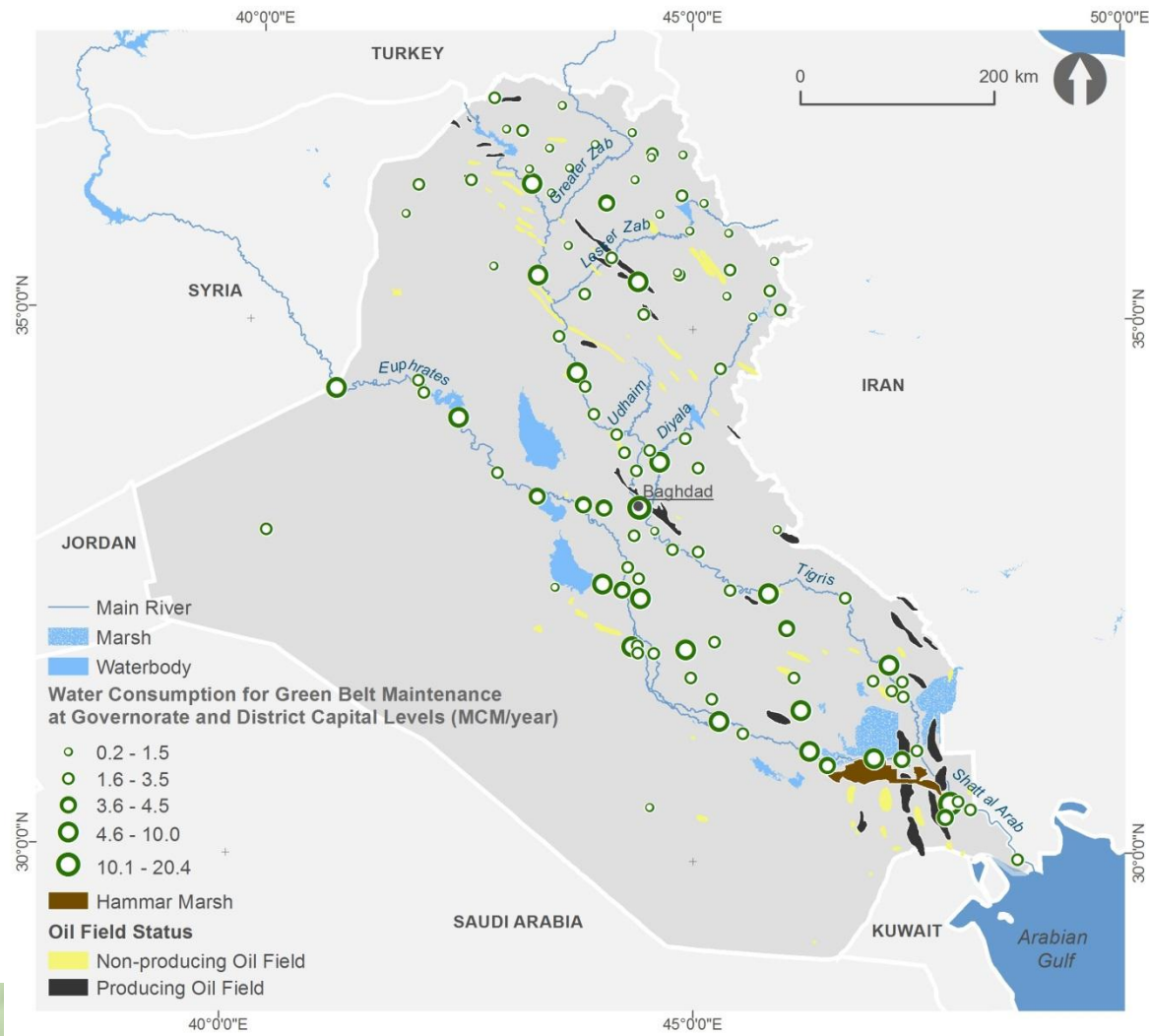
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# REUSE OF DRAINAGE WATER IN IRAQ

## Option 2: Green belts around the cities

- 150m wide Green belt
- Selected species of salt tolerant tree varieties and bushes
- Drip irrigation in the first years
- The project covers the governorates and district capitals
- A total of 28,000 Ha are concerned
- A total water demand of 0,313 BCM / Year compared to the 9,3 BCM of drainage water generated





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# REUSE OF DRAINAGE WATER IN IRAQ

## Option 3: Supply the Hammar Marshes

Net from the re-use of water for **oil field re-injection** (0.550 BCM/y) and the proposed **green belts** program (0.313 BCM/y), the MOD will still provide an additional 2.611 BCM annually from the drainage of irrigation projects





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# REUSE OF DRAINAGE WATER IN IRAQ

## STRATEGY IMPLEMENTATION: AN ALTERNATE FUTURE

| DRAINAGE WATER RE-USE [BCM/Year]                        |       |       |       |       |       |
|---|-------|-------|-------|-------|-------|
|   | 2015  | 2020  | 2025  | 2030  | 2035  |
| <b>Oil Sector</b>                                       | 0.162 | 0.211 | 0.338 | 0.521 | 0.550 |
| <b>Hammar Marsh (via MOD) + Shatt al Arab (via ETD)</b> | 3.306 | 3.899 | 4.166 | 3.834 | 3.693 |
| <b>Green Belts</b>                                      | 0.313 | 0.313 | 0.313 | 0.313 | 0.313 |
| <b>Total Drainage Water Consumption</b>                 | 3.781 | 4.423 | 4.817 | 4.667 | 4.556 |

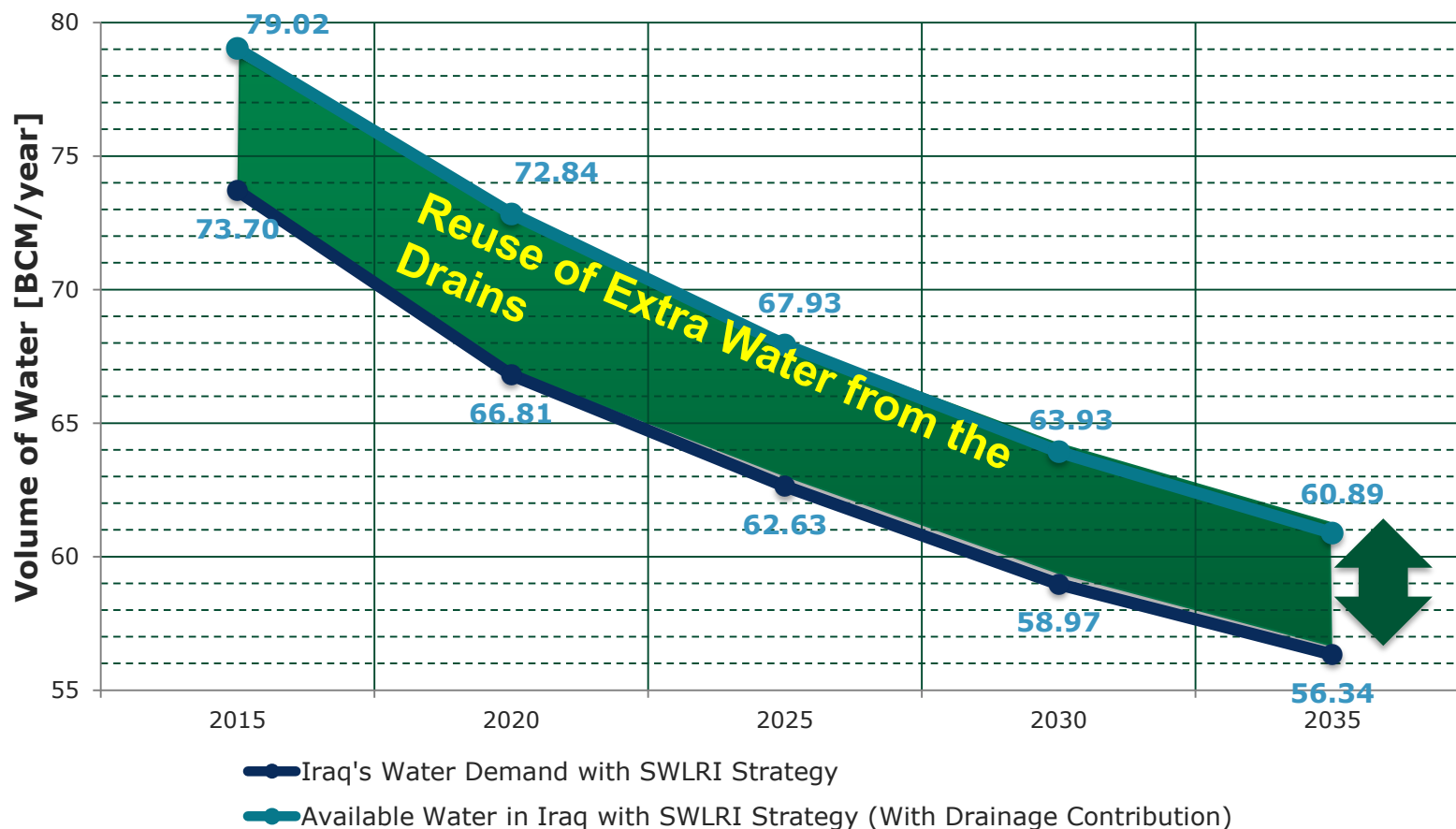


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# REUSE OF DRAINAGE WATER IN IRAQ

## STRATEGY IMPLEMENTATION: AN ALTERNATE FUTURE







## CONCLUSION

- Water scarcity necessitates efficient use of water and identification of creative ways for reusing water.
- The re-use of drainage water greatly expand the ability of Iraq of meeting its objectives for 2035 and beyond
- Poor water quality and topographic constraints limits the reuse in agriculture
- The reuse of drainage water can sustain industrial and environmental needs



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# REUSE OF DRAINAGE WATER IN IRAQ

**THANK YOU !**

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International Project Manager



**CACG**

Valorisons votre territoire

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