Optimizing Transboundary Water Allocation: A Decision Support Tool to Meet Water-Food-Energy-Ecosystem (WFEE) Demands

BY

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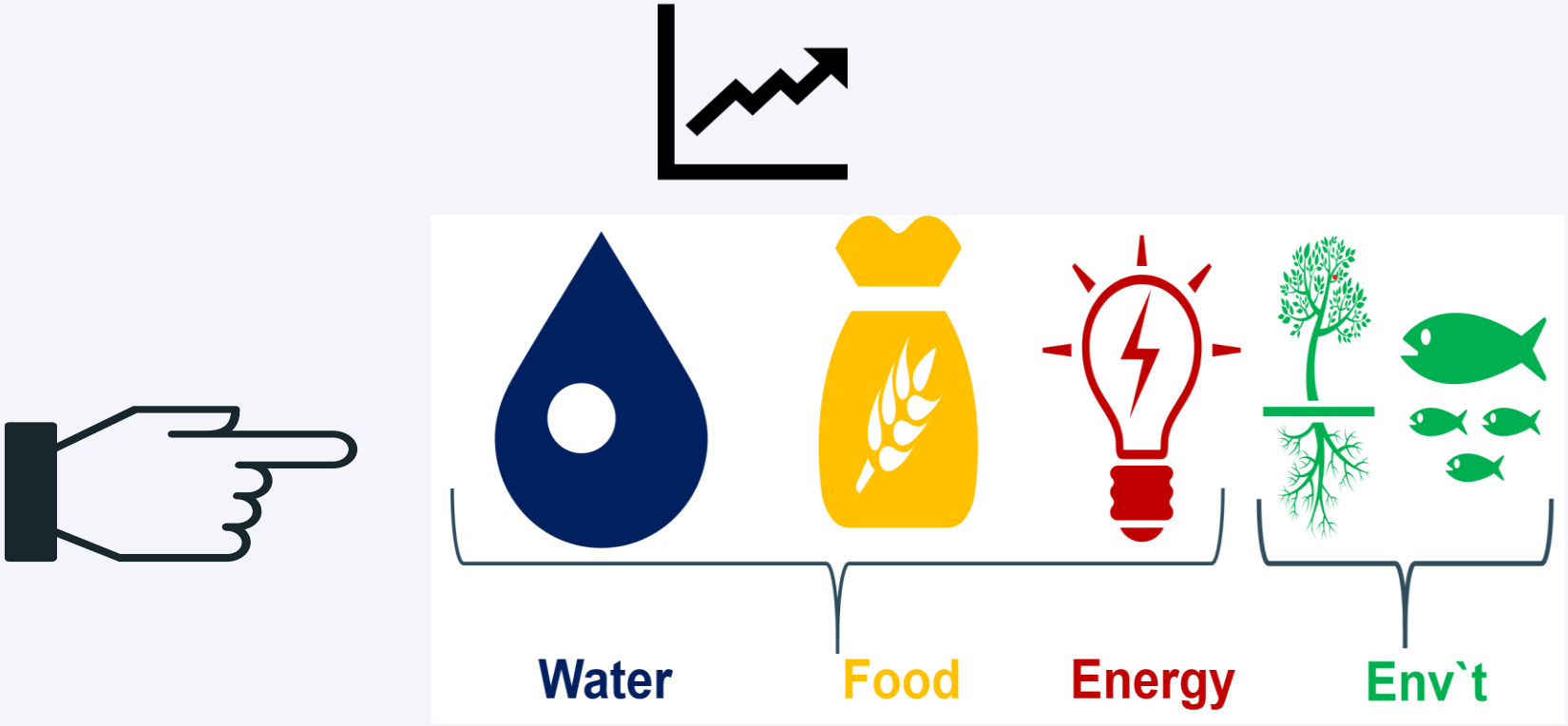
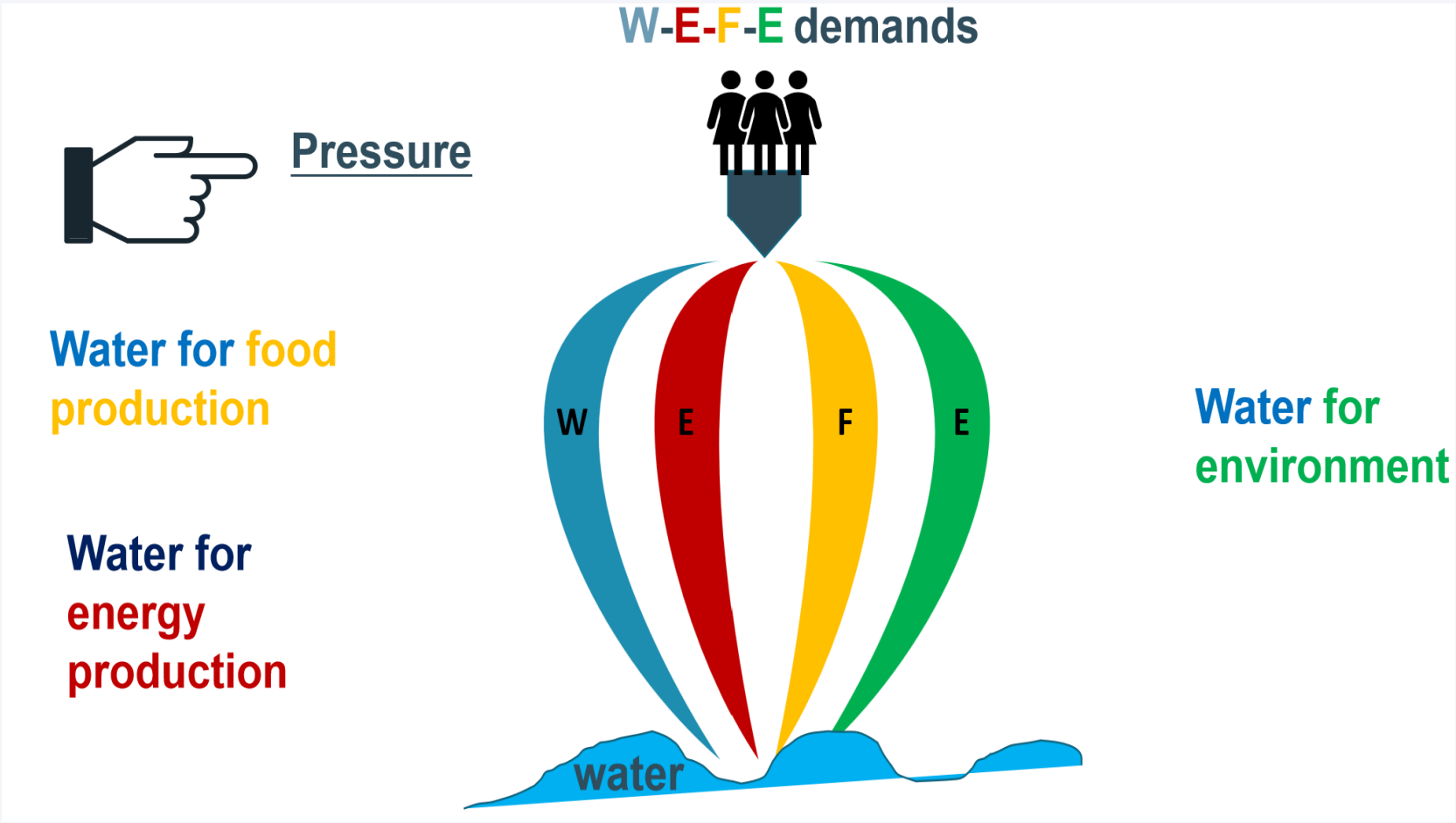
General background

Global problems

Impacts



Impacts cont…



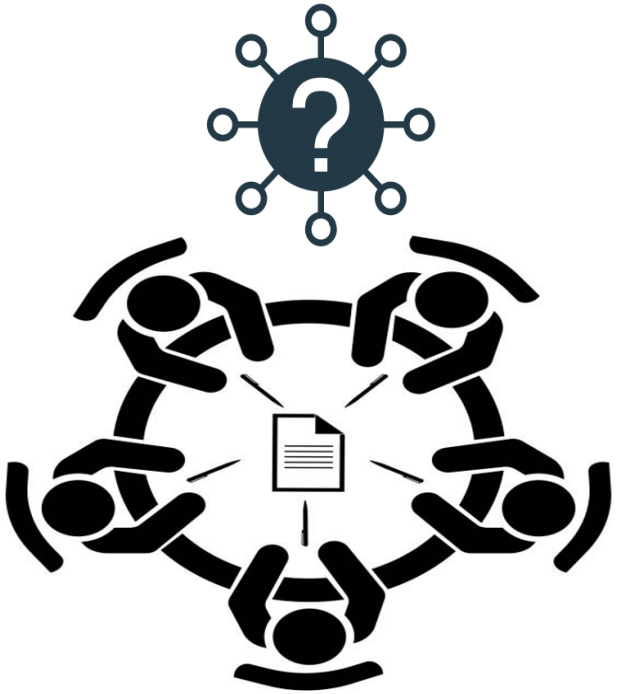
Impacts cont…

Multi functional demands

How to solve?

stakeholder

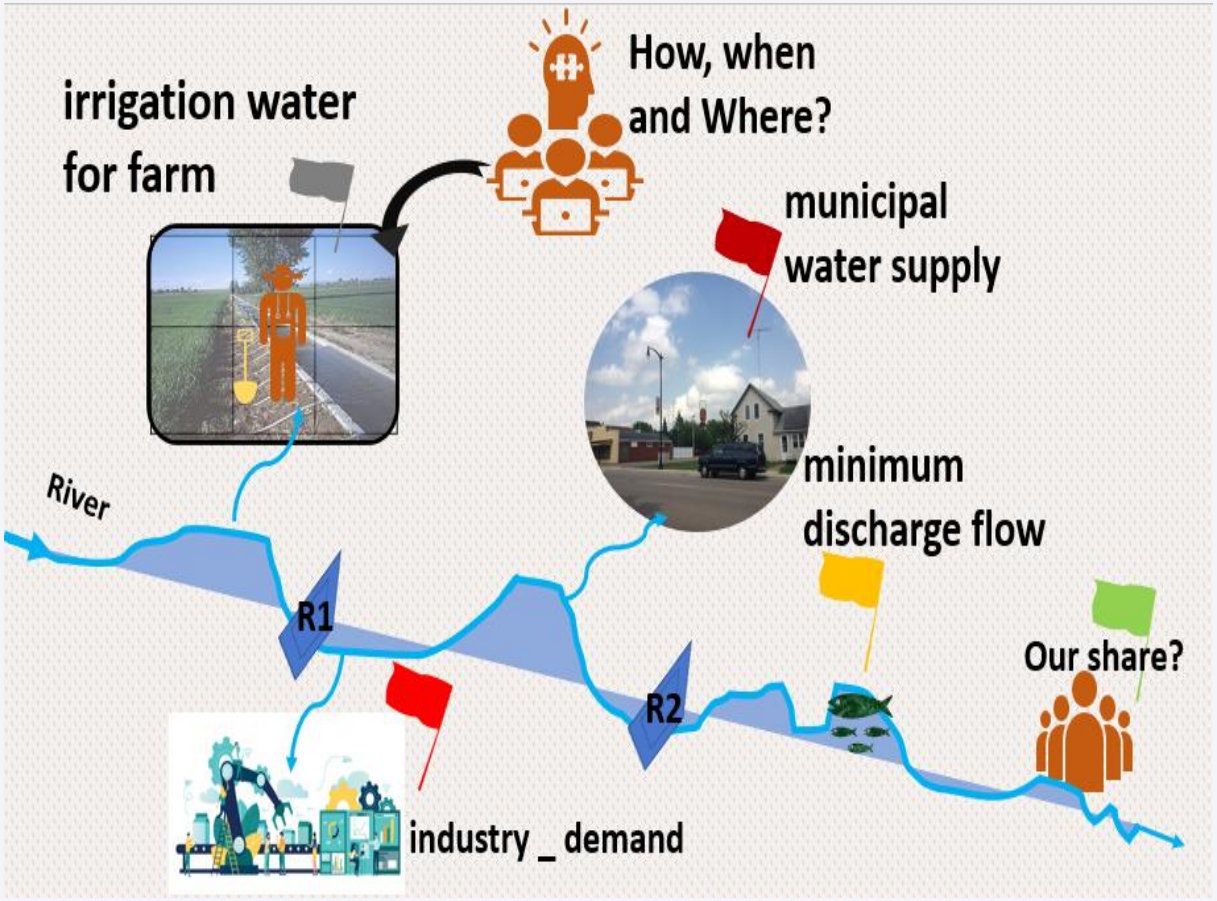
Searching?

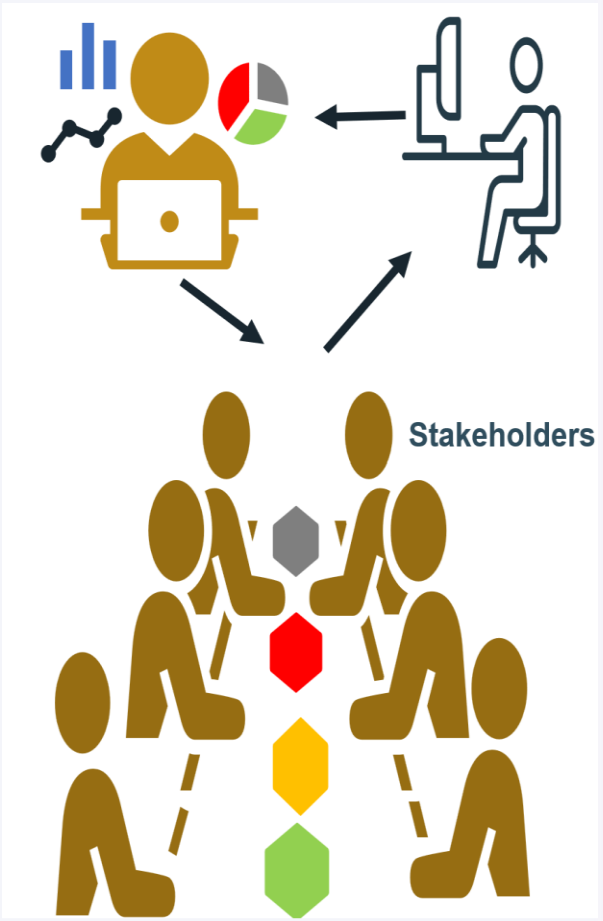


Method

- Lack of decision support tool that addresses water allocation problems.

Dev`t of decision support tool(*Gebre model*)





Water allocation model

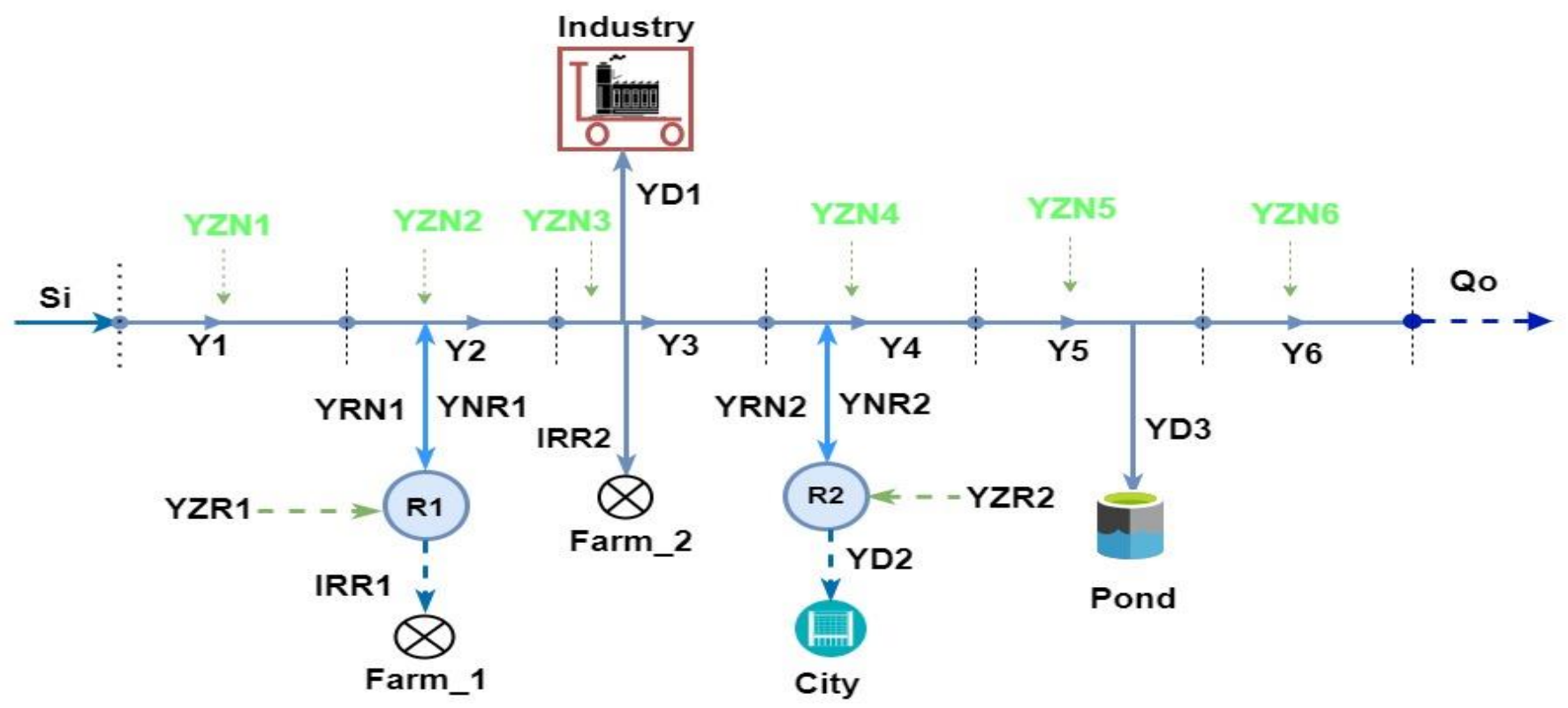
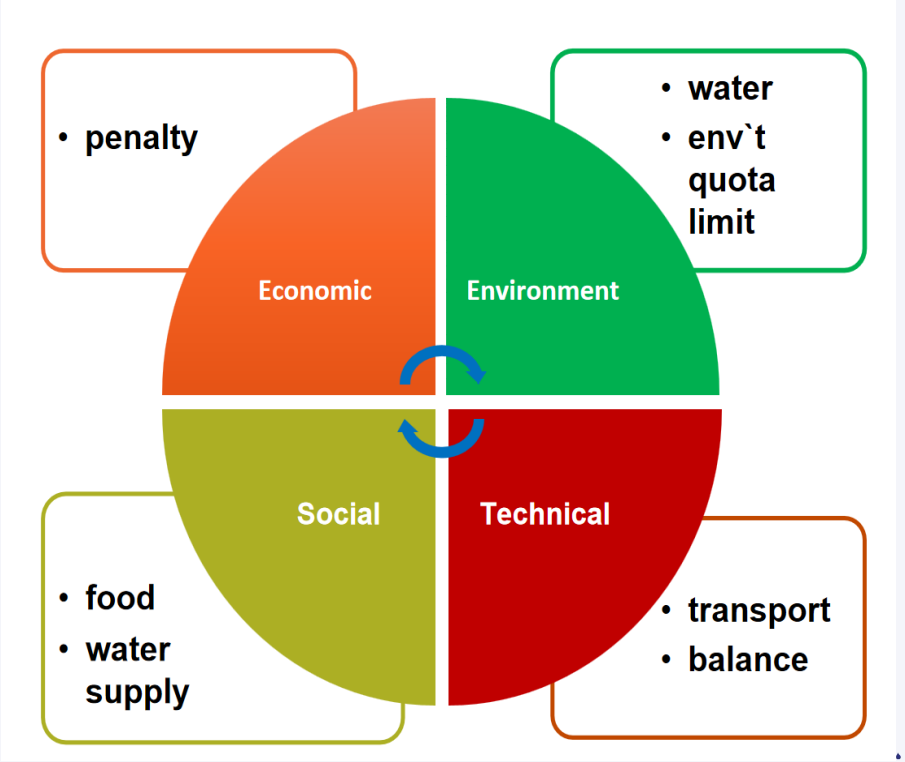


Fig. Schematic representation of water allocation model

Water allocation model

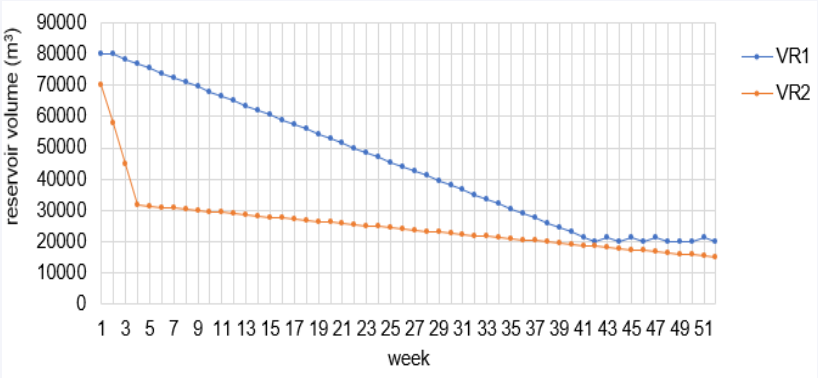
Objective function

Minimize the costs associated with transporting water through reservoir links, while also penalizing unmet water demands.

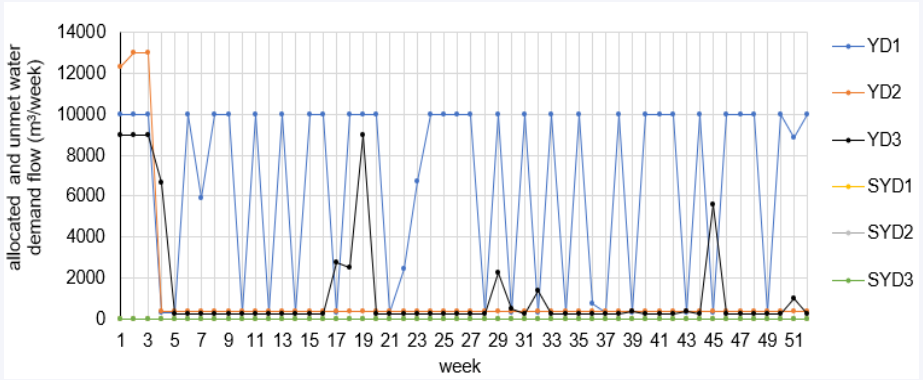


Result

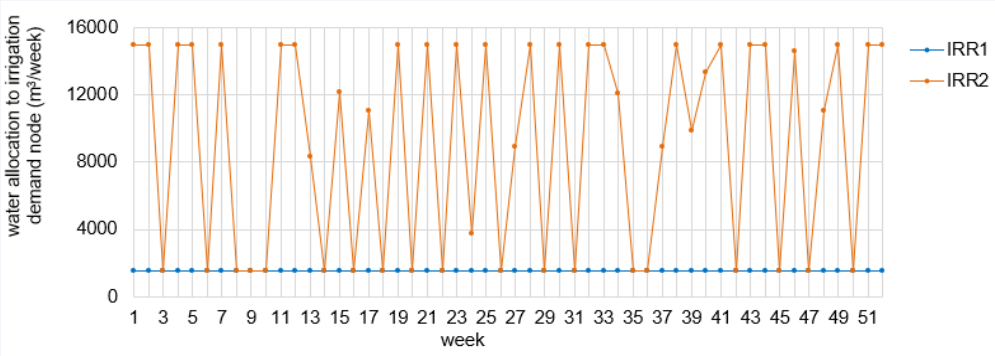
Reservoir water volume storage model simulation result



Water allocation for different water demand flows



Water allocation for irrigation water demand flow



Conclusions

- *the Gebre model allocates the available water to the different water users and produces an optimal solution considering the dynamic water availability.*

- *the model is flexible and versatile.*

- *the decision tool can help prioritize interventions and investments, particularly in transboundary water resource management, to promote fair water sharing and facilitate multilateral cooperation and collaboration rather than unilateral investment and water utilization to meet ecosystem demands.*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