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Greywater Recycling for Agricultural Irrigation

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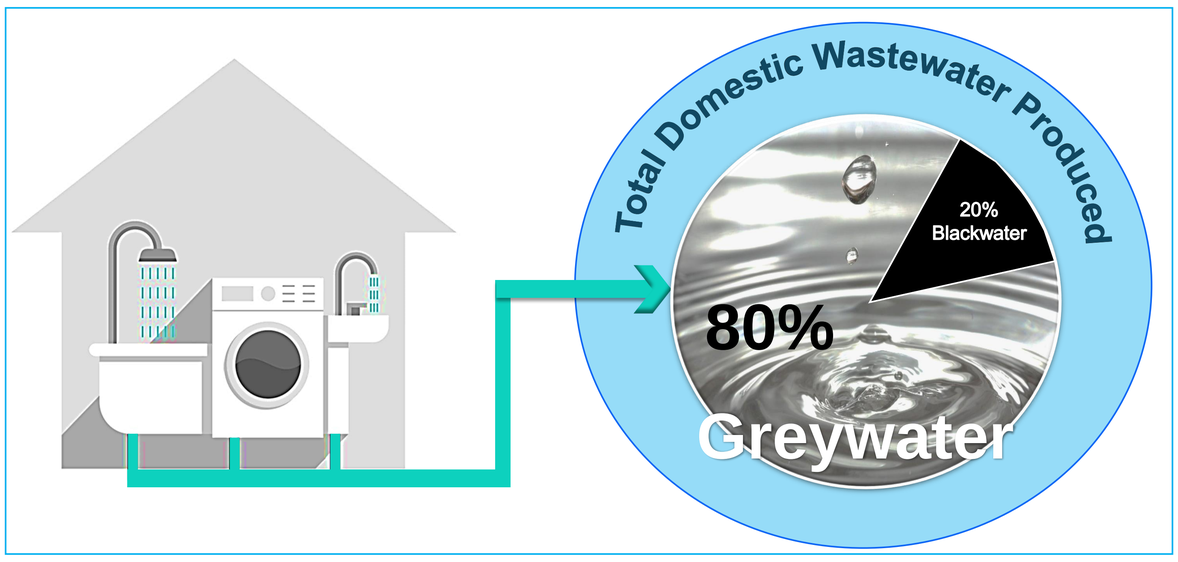
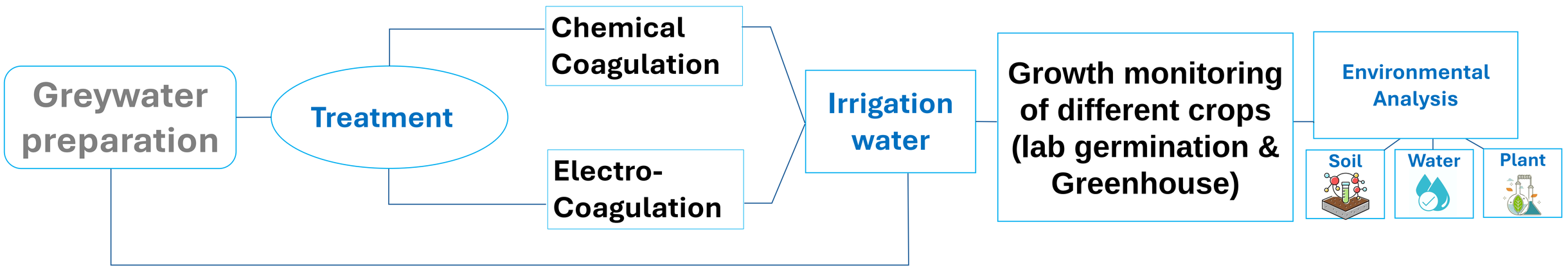


Greywater as a sustainable alternative of freshwater for irrigation?

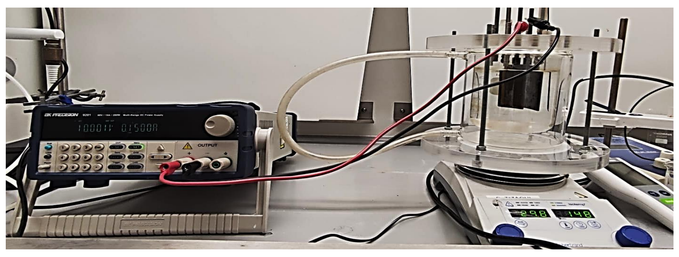
- Global warming and climate change are limiting the available freshwater resources.
- Irrigation is the major freshwater consumer by 70-90 % of the freshwater allocation in most countries.
- GW is characterized by low organic strength and high volume for daily produce.
- Reusing GW contributes to freshwater conservation, reduces pollution, and relieves the pressure on municipal water treatment plants.
- Reusing daily GW produce saves money.

Scientific Approach



Results

Synthetic Greywater Preparation

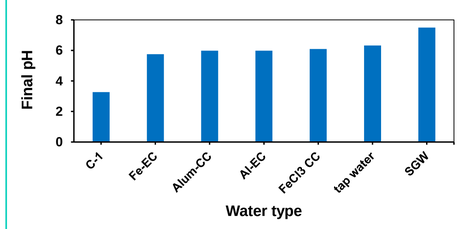


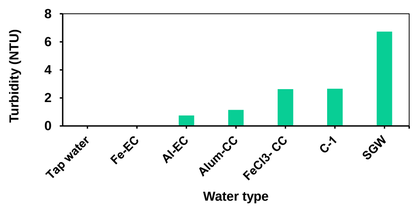
Optimized Al & Fe Electrocoagulation

Optimized Alum & $FeCl_3$ Coagulation

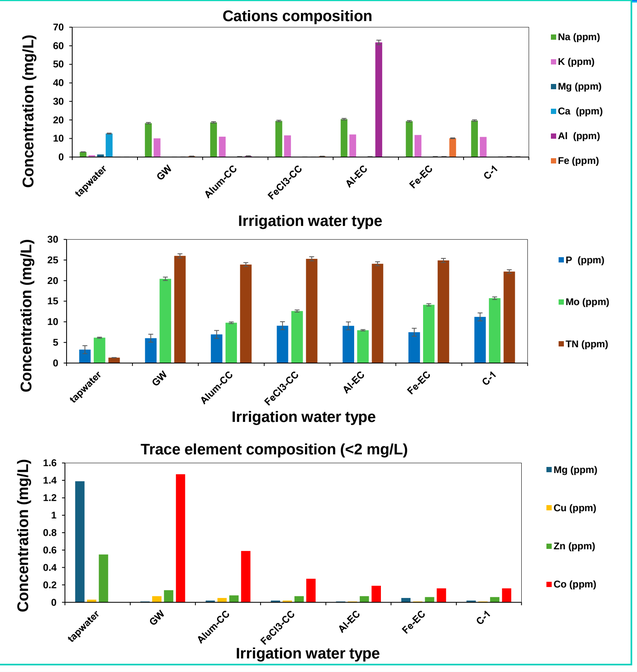
Preparation of Irrigation Water

Germination & Greenhouse Experiments

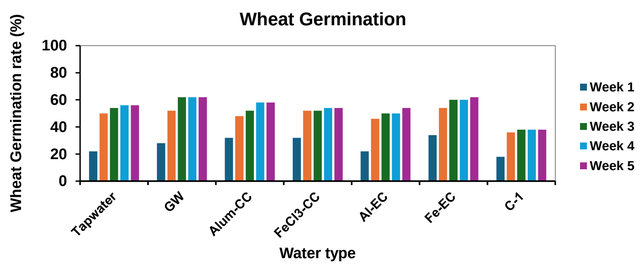




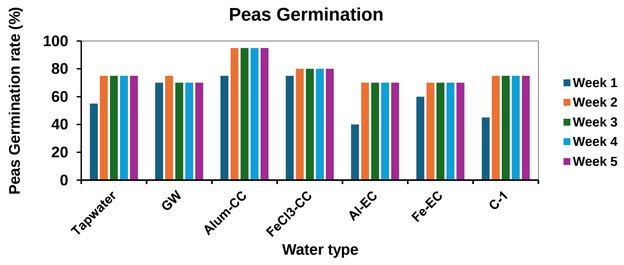
Water Analysis

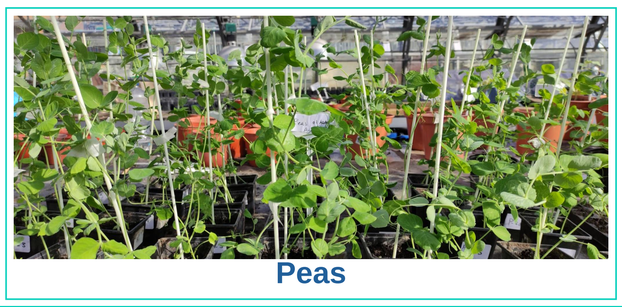


Monitoring the growth parameters

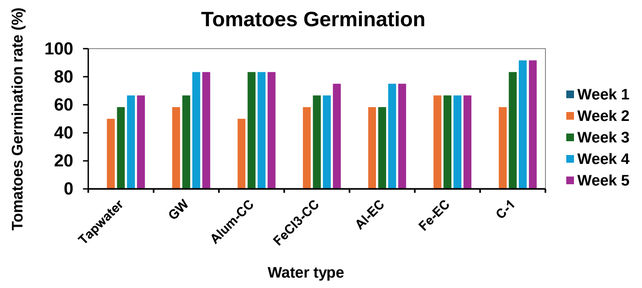


Wheat





Peas



Tomatoes

Conclusion

- Greywater treatment and reuse for irrigation proved to be suitable for crops irrigation leading to healthy plants.
- In comparison to fresh tap water irrigation, GW recycling for irrigation can effectively lead to increased resilience and adaptability of plants growth.
- GW recycling reduces the amount of sewer reaching municipal treatment plants thus saves capital costs and treatment resources and achieve a fit-for-purpose reuse.
- Although chemical coagulation treatment was less efficient than electrocoagulation treatment, it led to better plants growth due to higher micronutrients contents and essential elements required for plants growth.

Funding

- This PhD Project is funded by the British Council through Newton- Mosharafa Fund.