

GLOBE VSS Research Proposal

Project Title

Research Proposal: Investigating the Efficacy of Aloe Vera as a Natural Coagulant for drainage water Treatment

Researcher(s) Name(s)

- AHMED SALALAH MOUBARAK ELMISHIKI -CHIBANN SALALAH MOUBARAK ELMISHIKI

School/Organization Name

- OSSAMA BEN ZID (5-9) [OMAN]

Teacher/Mentor Name(s)

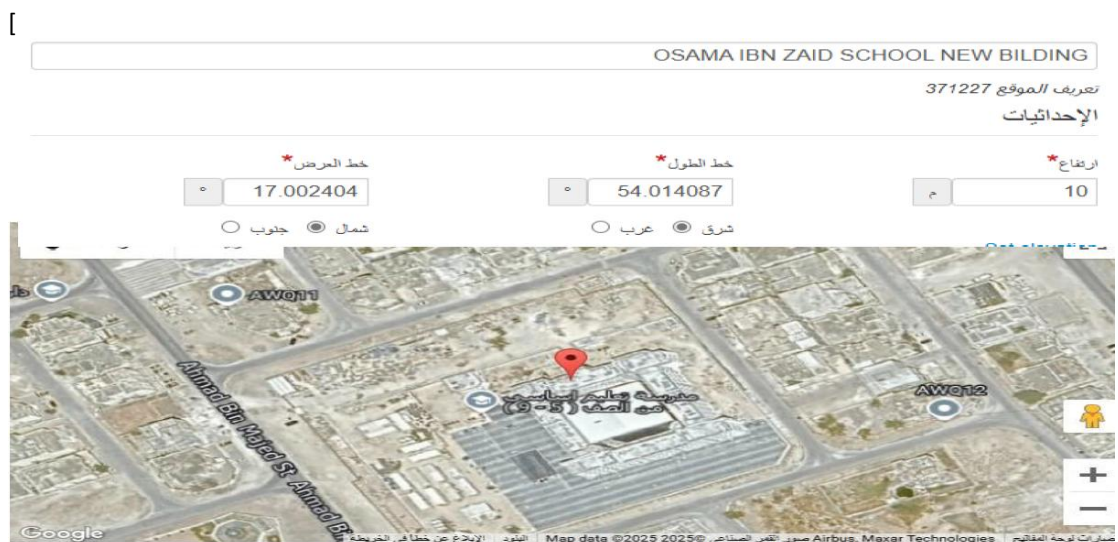
- RAMZI ABDALLAH CHENINI

Research Question(s) and Hypothesis

- Research Question:** To what extent can Aloe Vera plants reduce the Salinity and Conductivity and adjust the pH levels of local drainage water samples?
- Hypothesis:** We hypothesize that the natural mucilage in Aloe Vera will act as a bio-coagulant, significantly decreasing water turbidity and neutralizing pH levels compared to untreated samples.

Description of Study Site

- Location:** [north of Aquad\salalah\oman]
- Coordinates:**



- Local Environment:** The study will be conducted in a [Urban/Coastal] setting, specifically using water samples from [Domestic Graywater].
- Climate:** [Subtropical Arid].

Data Collection Plan

A. Data Types and Sources

- GLOBE Protocols:** We will use the **Hydrosphere** protocols: salinity, pH, and conductivity
- Data Origin:** We will collect original experimental data and may compare it with existing regional water quality data from the GLOBE database.

B. Data Collection Schedule

- Duration:** Data will be collected over a period of [4 weeks].
- Frequency:** Testing will occur [once per week].

C. Equipment and Tools

- pH Meter

-Conductivity Meter

-TDS/Salinity Meter

D. Roles

- [AHMAD ELMISHIKI] will manage sample collection; [CHIBANN ELMICHIKI] will perform the Aloe Vera processing; and CHIBANN ELMISHIKI will record measurements, and upload data to the GLOBE platform.

Background and Supporting Information

- **Why this topic:** We chose this topic to find a sustainable, low-cost, and non-toxic alternative to chemical coagulants (like Alum) used in water treatment.
- **Community Relevance:** This is highly relevant to our region to help manage water scarcity by exploring ways to reuse graywater for irrigation.

Expected Outcomes or Goals

- We hope to learn the optimal concentration of Aloe Vera needed to clear wastewater.
- We aim to contribute a natural solution that helps our community treat water safely without expensive infrastructure.

Challenges and Considerations (Optional)

- **Challenge:** The organic nature of Aloe Vera might increase the Biological Oxygen Demand (BOD) if overused.
- **Solution:** We will test varying small dosages to find the "sweet spot" where turbidity is reduced without adding excessive organic matter.

References

- GLOBE Hydrosphere Protocols.

Ebeling, J. M., et al. *"Evaluation of low-cost, natural coagulants for treatment of aquaculture wastewater."* Focuses on how plant-based polymers reduce suspended solids.

Ramavandi, B. (2014). *"Treatment of water turbidity and bacteria by using a coagulant extracted from Aloe vera."* Published in *Journal of Water Process Engineering*. This is a "must-cite" for its data on disinfection.

Saritha, V., et al. (2017). *"Potential of Aloe vera as a coagulation-flocculation agent in water treatment."* A comprehensive look at the dosage-response relationship
