Designing Desalination Plant for Groundwater and Seawater by Using an Evaporation-Condensation System with Solar Cells.

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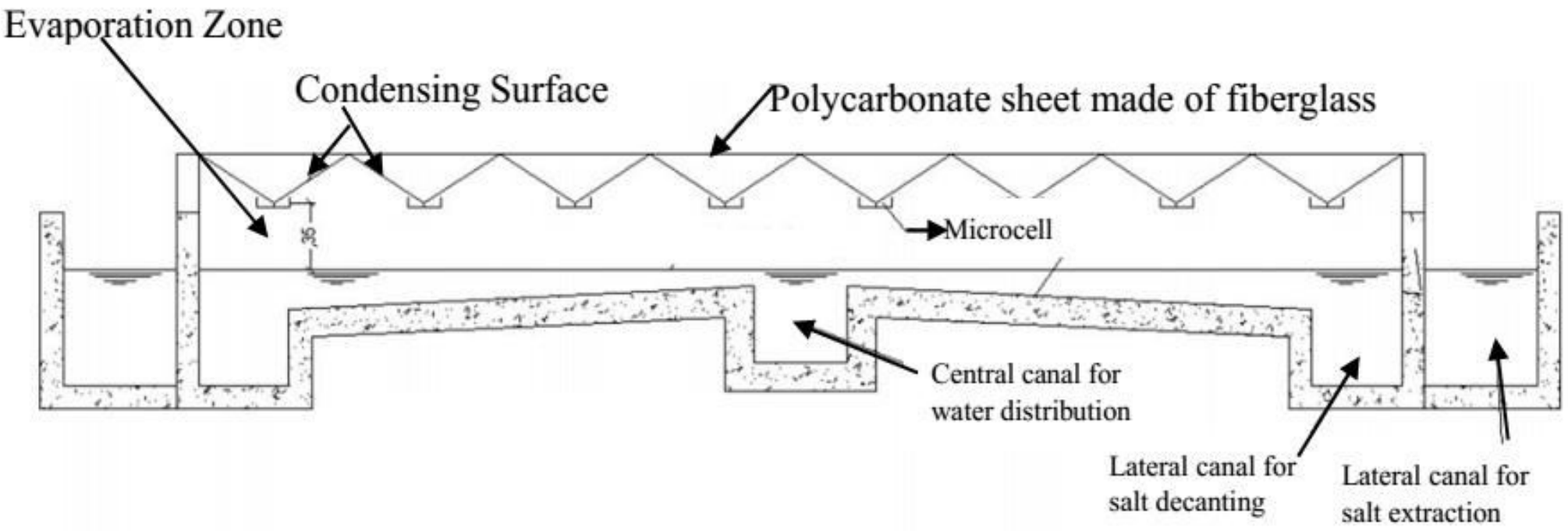
Introduction

- We are in the top four biodiverse countries… Some regions in Colombia are water scarce.
- Water scarcity is due to:

1. Strong El Niño events (precipitations decrease by 80% on average).
2. The bulk of the population is concentrated in the Andean Region which only has 15% of water supply.

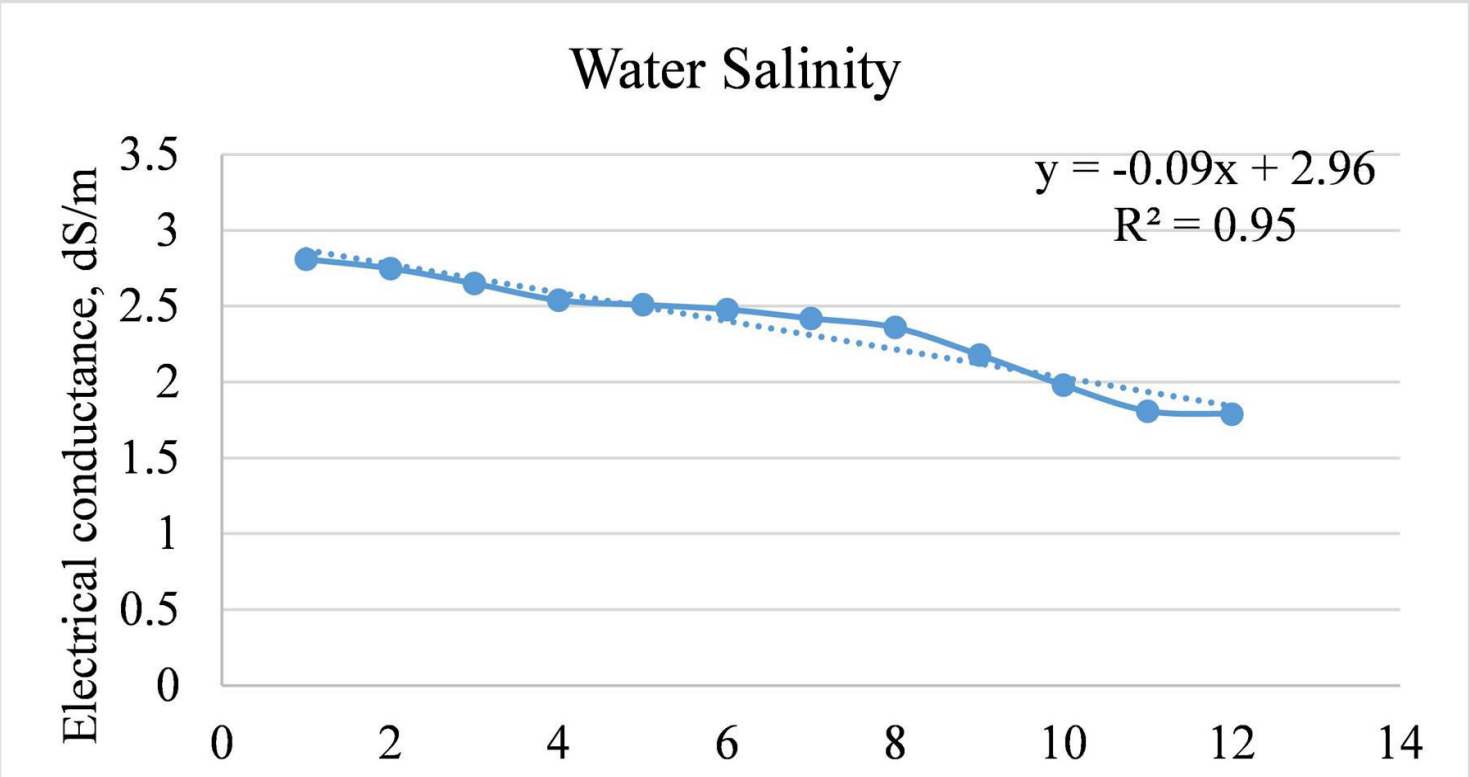
- Therefore, using water from sea could be a way to face water scarcity.
- Our goal was to design a **Disalination Plant** for Groundwater and Seawater by Using an Evaporation-Condensation System with Solar Cells.

Design



- Capacity to treat a total uptake flow of 0.28 l s^{-1}, desalinating 1 m^3 h^{-1}.
- Evaporation Area 100 m^2.
- Evaporation Rate 10 mm h^{-1}.
- Average flows of 0.03 l s^{-1} in each condensation cell.
- Operation at longitudinal slopes about 0.75%, with a run length of 30 m.

Results



- In the evaporation zone.
- Salinity Reduction of 64%.

X axis: Number of repetitions each 5 minutes.

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Results

- It is feasible to build a second scale model to treat 10 m^3 h^{-1} of saltwater (increase the energy in evaporation cells or increase evaporation surface).
- The desalination plant could be a supply option for sites with low rainfall and high evaporative demand.
- This design promotes the use of clean energy and water reuse.