

Atmospheric Hydroponic System



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INTRODUCTION

The solar-powered Atmospheric Hydroponic System offers a cost-effective, eco-friendly solution by extracting water from air and integrating it with hydroponics. This innovative approach boosts food production while aligning with sustainability goals like Saudi Vision 2030.

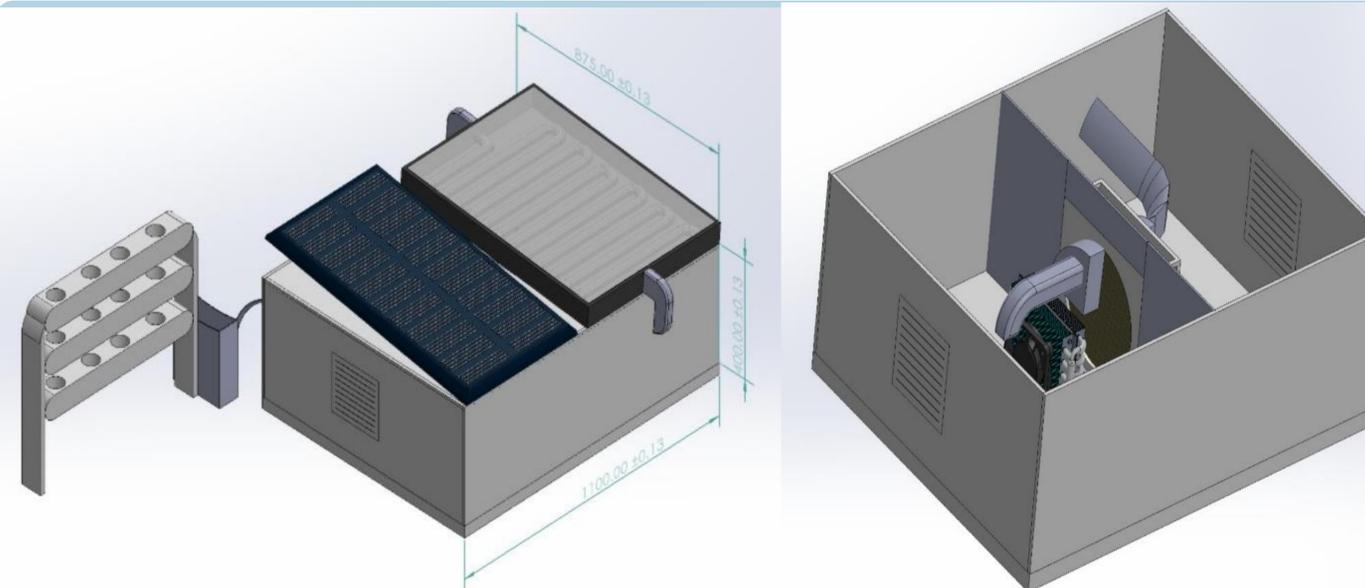
PROBLEM STATEMENT

Lack of irrigation water is a dilemma in many regions without treatment technologies. Even in rainy areas, water without nutrients is unsuitable for plants. Farms near contaminated water rely on costly external sources. Existing technologies are expensive and inefficient, especially in low-humidity areas. A high-efficiency system is needed.

CONSTRAINTS

- Produce around 25 liters
- Humidity level between 40% to 70%
- 8-11 Operating hours

PROTOTYPE DESIGN



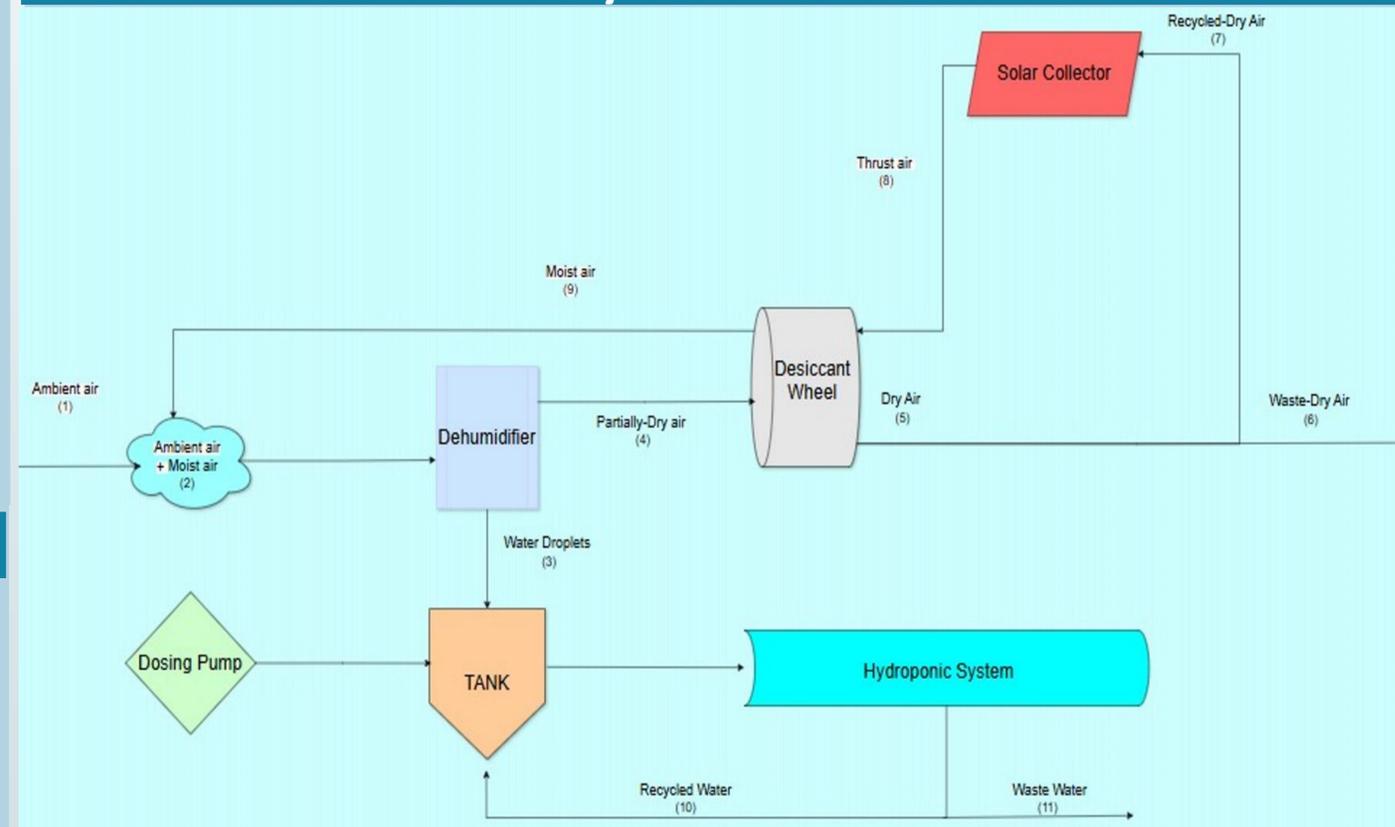
TARGET SPECIFICATIONS

- 6–12-liter water / day
- Nutrients Concentration 20–170 mL for lettuce
- 30 – 50 % faster growth rate
- Energy Efficiency 30% – 60%

Validation and Verification

- ✓ Produce 10 liter/ day
- ✓ Operation hours
- ✓ Energy efficiency

The System Overview



PROJECT IMPACT

- ❖ Economic
- ❖ Societal
- ❖ Environmental

CONCLUSION

The solar-powered Atmospheric Hydroponic System offers a novel, long-term answer to irrigation issues in water-scarce areas. It fulfils economic, and environmental demands by utilizing solar energy and efficient water extraction technologies, while also aligning with future sustainability goals.