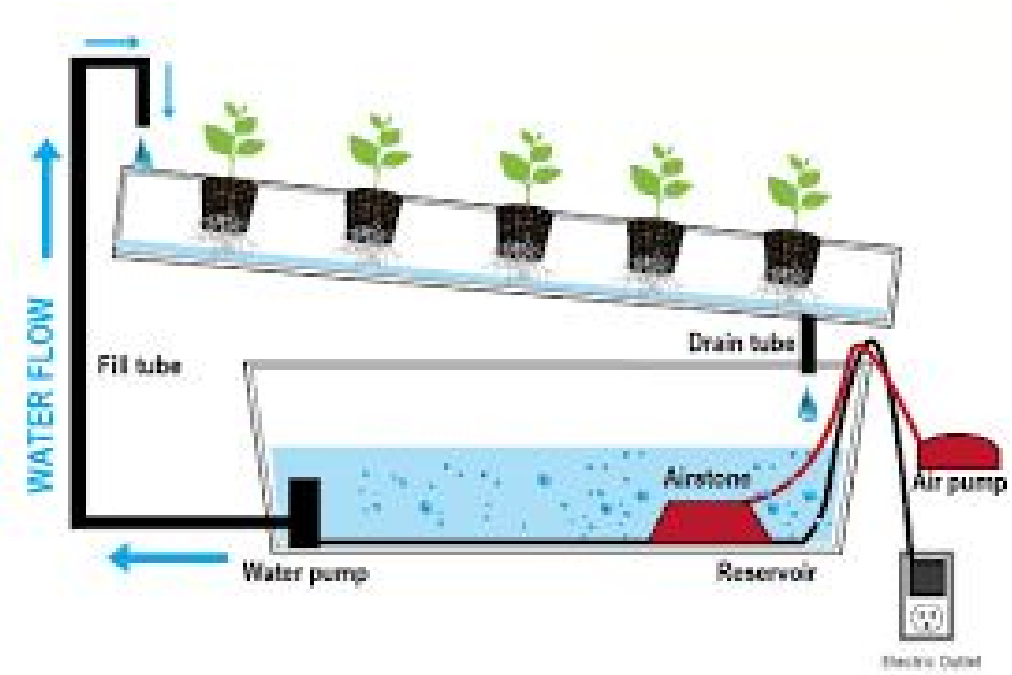
Design Criteria

Group 8



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GNG1103 - Deliverable C

- **Team's List of Interpreted Needs:**
    - Making it portable and small, but with the greatest yield.
    - Making the reservoir large enough, easy to clean, and making the drip system easier to align.
    - Making a good place to brand our story which includes the Parkdale Food Center, Growing Futures, and sponsors.
    - Needs the modularity, the good lighting, and the good spacing of the plants.
    - Making the water systems lightweight.
    - Lighting should be made of LED bulbs because LED bulbs can save more electricity.
    - Sensor to alert when reservoir is empty.
    - Bigger reservoir.
    - On wheels, the size and the material of the wheel.
    - Small enough to fit in elevator.
    - Backup reservoir.
    - The plant is easy to survive in the reservoir.
    - Grows fresh vegetables.
    - Has low consumption of clean water.
    - Extremely low cost.
    - Works with little / no electricity.

1) **Portability**
-On wheels
-Foldable
-Small but efficient

2) **Accessibility**
-Modularity
-Lightweight
-Low to the ground
-LED light

3) **Reservoir**

-Big reservoir and removable
-Easy to clean
-Sensor
-Feeds each plant equally (equality is nice)

4) **Branding**

-Good place to sell and market product (food market)
-They already have connections with markets.

- **Functional requirements:**
    - Ability to grow healthy and eco-friendly plants
    - Works without electricity (recommended)
- **Constraints:**
    - Design Criteria (*figure 1.* shown below)
    - Cost (CAD) $500-$1000
    - Size (when folded) *60cm width X 180cm height X 60cm length*
    - Operating conditions: Indoor room with no sunlight
- **Non-functional requirements:**
    - Product life (years)
    - Placed location: Indoors with no direct sunlight
- **Primary Design**
    - Reused materials (eg. PVC pipes)
    - Sponge as a growth medium
    - Clear plastic storage tanks to house the entire systems
    - Waste water goes through filtration system
    - Water reservoirs to collect water for reuse
    - Automated filling reservoir systems

Benchmarking

Benchmarking will be performed to understand the current market for growing solutions. With benchmarking, we will quantify the design specifications in order for our design to compete in the current market.

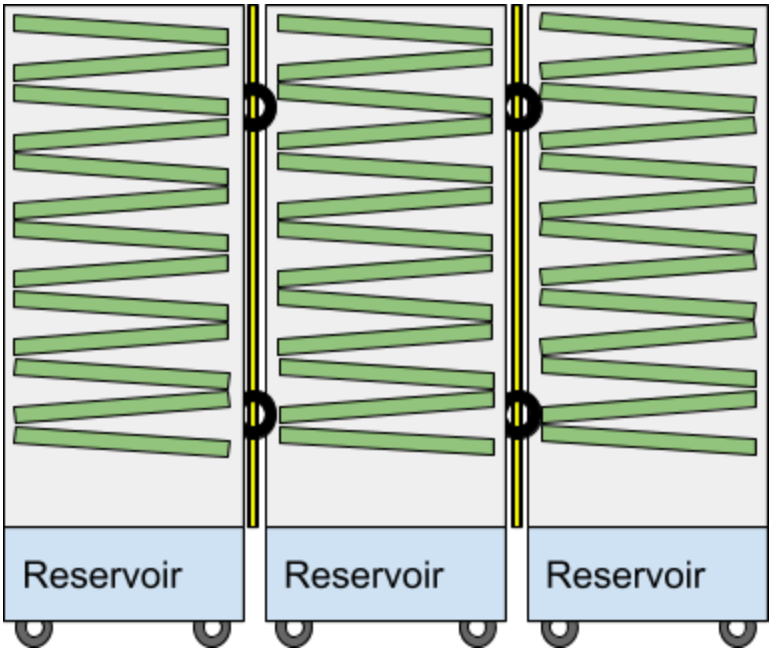
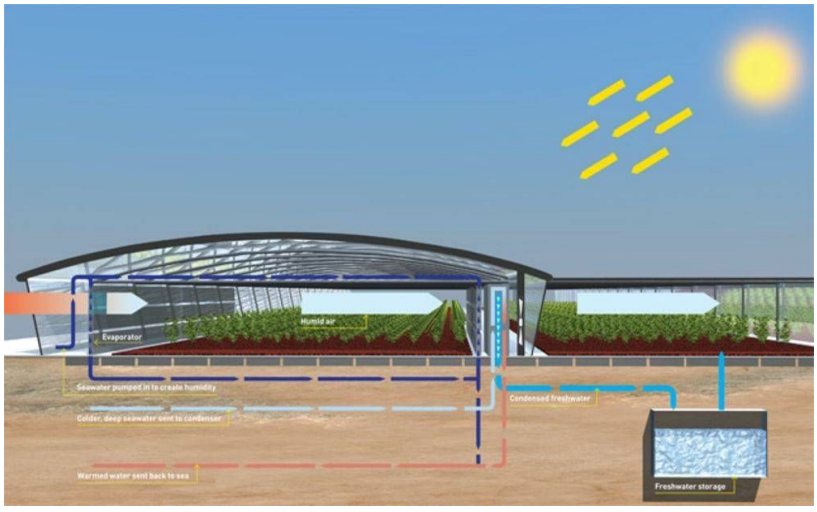
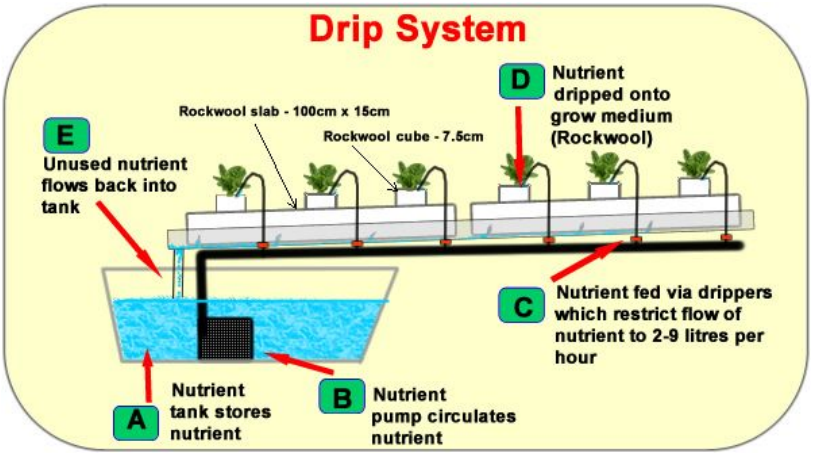


Figure 1: General Hydroponics EcoGrower Drip Hydroponic System

1. Desert Farming Solution
    1.1. A benchmarked solution that we have identified as being related to our own problem is a design created for mass produced desert growing . The purpose for this design is to allow farmers to grow valuable produce in the desert for financial gain.



2. Drip System
    2.1. Building a small and affordable hydroponics system can be relatively simple. The drip system is a cheap and effective way to build a hydroponics system.



3. Flood and Drain System
    3.1. This system requires the plants to be orientated in a series formation.