GNG1103 - Deliverable B - Needs Identification and Problem Statement

Team: D1 - Hydroponics 1

Introduction:

The main objective of this project is to design a greenhouse and hydroponics system for the Algonquins of Barriere Lake. Barriere Lake is an area that mainly consists of sand and bush, with no running water. Most of the drinking water is collected from springs. Due to this lack of running water, the greenhouse and hydroponics system must be entirely self-sufficient. The following document describes the client's needs for both the greenhouse and the hydroponics system, the project constraints, the priority of each need, and the problem statement.

Needs:

Greenhouse should be:

- Easy to maintain -- no stores up in Barriere Lake
- Low cost
- Safe around children
- Stringent with water usage; needs a rainwater collecting system
- Able to work for three seasons of the year
- Self Sufficient
- Protected against rodents/animals
- Easy to assemble
- Mindful of sandy terrain and bushes
- Way to see the water level
- Easy to clean
- About 6x6 or 6x8, size is up to us -- 6 greenhouses will be made, structure must take the size of the hydroponics system into account
- Have contents for 4 to 5 people
- As easy to use as possible, not a lot of money to pay for nutrients, fertilizer is inaccessible, etc.
- Growing plants that grow quickly, like lettuce -- there is a lot of snow out there, so need vegetables that grow quickly. Very cold, can easily get as cold as -35 °C

Hydroponic System:

- Needs recycled running water that is filtered (need to collect rainwater somehow)
- Needs to be entirely self-sufficient, along with the greenhouse

- Needs to work for 3 seasons, if you can make it run during the winter that would be great -- in the winter can use snow as water, but also the greenhouse needs to be warm enough to grow the plants
- Don't have the pumps -- we need to decide on what we have to do for the pumps
- Gravity powered hydroponics system was very good
- Need a simple filtration system to clean water, the water is recycled over and over again, a bucket of water probably lasts a week
- Nutrient Film Technique (NFT) (the one with the mat)
- How are plants being held in place

Constraints:

- Budget
    - Hydroponics -- limited to $100
    - Construction for all of it -- $500 max
- Size of greenhouse
    - Size of greenhouse determines how large our hydroponics system can be -- need to work together with the construction team
- Time -- has to be ready by the 26th of March

Rank	**Need**
1	Easy to maintain
2	Self-sufficient
3	Durable to withstand environment (ie. weather, wildlife, sandy terrain)
4	Low cost
5	Controlled water distribution
6	Easy to transport
7	Capable of working through

Problem Statement:

The Algonquins of Barriere Lake require a three season greenhouse and hydroponics system that is entirely self-sufficient, easy to maintain, and durable enough to withstand all aspects of the surrounding environment.