

Project description

We live in an isolated village called La Tabatiere. Located on the lower north shore of Quebec our village is inaccessible by road which makes it difficult to obtain fresh fruits and vegetables. When the boat or plane does arrive, produce is already at least a week old. By the time the “fresh” fruits and vegetables get here the majority of it is already brown or rotten. The food we receive is, for the most part, expensive due to the costs required to transport. This leads to the food being sub-par and environmentally inefficient.

Our village was once a thriving fishing community for many years. However due to the recent closure of our fish plant, the economic hub of our village, many jobs were lost. This has led to a steady decline of the population throughout the past three years. Now there are approximately 450 individuals and that number is still falling. Our student body from primary to secondary 5 consists of 44 students and is expected to fall to 20 within four years. This was one of the driving forces that motivated our development of this project.

Seeing this opportunity we then decided to proceed in building a hydroponic growing station that would be indoors, and that could provide our desired produce throughout the entire year, no matter how cold the winters get. With our group of three students and a supervisor we began our planning, designing, and production. Within a couple months time we hoped to be up and running to begin the harvesting and selling of the produce.

Our goal of this project was not only to make money, our vision was much broader. We wanted to prove a concept, the viability of this business project as a legitimate source of revenue and jobs for our community. Although this may seem like delusions of grandeur for our small scale project it is quite the opposite. We have shown that with a 48 sq. ft. footprint we were able to pack 192 sq. ft. of growing space producing fresh organic lettuce that is pesticide and herbicide free in the middle of one of the harshest northern winters we’ve experienced in many years. Our projected net earnings will be approximately eight hundred dollars a month with a continuous weekly harvest.

Before growing could begin, we had to choose foods that our inhabitants would actually be interested in purchasing, would be quick and easy to grow in a hydroponic

setup, and, most importantly, would be able to turn over a dollar. After much discussion we settled on; Mixed Lettuce, Basil, Chives, Dill, Cilantro, and Baby Spinach. Villagers would know what these products were and wouldn't have to pay an extremely high price in order to get their fresh, organic vegetables and herbs. On February 28th people of our village experienced for the first time fresh food harvested the same day as their purchase.

After showing our project to our mayor, Randy Jones, he was excited at the potential of expanding this operation to a twenty thousand sq. ft. building that could possibly supply the entire lower north shore with lettuce and herbs. With the added space we could even grow fruits such as tomatoes, cucumbers, and peppers.

Process and Involvement

We saw how there was publicity for the Quebec Entrepreneurship Contest and began a club that would work together in order to enter.

Initially we spent time brainstorming what we would do for the project. We had to think of many aspects of starting a business in such a small community. We knew from the start no matter what type of business we chose to pursue our resources and work space would be limited. After each of us did a fair amount of research on different types of business opportunities we came to a shared conclusion. We wanted to focus on production. This led to the eventual idea of developing a hydroponic growing system.

Our first activity was to figure out how to actually start and how we were going to finance the project. We wrote up a proposal and presented it to the schools' governing board asking for \$1800.00, as well as the ability to do additional fundraising throughout the year to repay this loan. In return for this, we said we would pay them back at the end the full amount with a five percent interest.

We then reviewed scientific articles in order to determine how to get highest yields among the various methods of hydroponic growing, and finally settled on a system developed by Bernard A. Kratky due to its low cost. At first we planned to place our hydroponic system in a small shed provided by our teacher/supervisor that he had beside his residence, and had drawn up sketches and plans of how we were going to fit the system. After some discussions, we were denied access to shed and were asked to find a place in the school to run our business, and came to a joint conclusion to use a textbook and miscellaneous storage room.

After going through many design plans, we stuck with a four shelf high (including ground level) and three trays long growing surface that would house our plants. This is how we were able to fit almost six hundred plants in a small storage room.

Collaboratively we determined the various constraints we would face and determined the materials that we would need to build the growing system as well as maintain the plants. Making a list of everything we needed, we then had to find out what retail location would give us the best cost to performance ratio for comparing the prices of

local stores and online sites. With the results back, we then proceeded to order the materials some of which took months to arrive.

After receiving a portion of the supplies we began to build, for countless hours a week we would spend the majority of our days putting together the structure of the system and the boxes that would be filled with water. Once the structure was done the tedious task of installing all 150 lights began. We then determined with the almost 3500W of power being used, we would need to split the parallel circuits onto three separate 15A circuit breakers, leading us to run wiring across the school.

At this point we began to prepare the boxes and structure for the growing process. We put plastic sheeting as a water barrier inside the wooden boxes, before filling them with water. Then we laid sheets of Styrofoam in which we drilled holes with a 2 inch diameter to allow the small plastic net cups to sit in.

Once all of these smaller details were done we began planting mixed lettuce and basil. These were the fastest growing and we were determined to get started. As the plants grew we needed to analyze and maintain the fertilizer and pH levels of the water using digital ppm meters and pH meters.

Finally we were able to make our first harvest. Clipping the basil near meristematic cells stimulated faster and fuller growth, selling 64 bags of basil. While distributing the basil we also gave free information brochures to show people (that have never used fresh herbs in cooking) simple recipes and how to dry herbs if desired, and other information on how to use any of our herbs.

Spin-offs

Students:

Due to the entrepreneurship program, the students of this project learned invaluable skills in the fields of planning, designing, construction, wiring, planting, harvesting, sales, marketing, and more. These skills can now be used in our everyday lives and will allow us to become contributing members of our community.

Target Group:

With the hydroponic project we are doing at the moment, the target group now has access to fresh lettuce and herbs. The target group is the people of the community of La Tabatiere, and due to our group growing this product and harvesting weekly the people can both support the students of the project and at the same time get produce that isn't a week old and pesticide ridden.

Community:

At the moment the community has benefitted from our produce, and hopefully with time, this simple benefit will become much greater. After recent observations by the mayor and members of our community, there is interest in the possibility of unemployed individuals taking over the project once the current students graduate.

School:

Both the students and the staff of Mecatina School have reaped benefits from the entrepreneurship project. The staff was not only provided with the lettuce and herbs but they were also involved in watching/helping their students make this idea become a reality. With that in mind, it was the students of the school though who received most of the benefits.

Learning:

This project has been a great motivation for learning as we are able to link what we are learning in class to real world applications. In addition to the construction, planting and maintenance of the hydroponic system, we also come in after school to get lessons on topics related to our project. Some topics covered can be found in the following list;

Links to curricular concepts:

- manipulating concentrations
- Solubility
- pH, ion concentration and osmosis
- applied agricultural technology
- Electrical engineering
 - wiring series and parallel circuits
 - Voltage, Current, Power, Resistance
 - Electrical safety devices such as circuit breakers
 - Electrical safety code
- Photosynthesis
 - Biochemical pathway
 - Effects of fertilizer, temperature, and different Frequency of lighting
- Microbiology (algae and anaerobic bacteria)
- Plant anatomy and physiology
- Light and the electromagnetic spectrum
- Constraints and construction processes
- Material constraints and codes for dead/live loads

Originality

This business opportunity provides the students with the chance to realize the importance of responsibility. Having to constantly maintain the plants and hydroponics growing system is a big job that requires a regular attendance. Also the tasks required for this business require the students to have a great deal of patience.

The business is also a great inspiration to some of the other students. All students from primary to secondary have come to view the development of our project and the weekly growth of the plants. It has shown them that even in such a small isolated town, with limited resources, if they put their minds on something they truly believe they can do; in the end they can accomplish it.

The business contributes to the community more than anything else. Our business is providing the local stores and therefore the local people with fresh organic herbs, a product that the stores could not have ordered before because they would be spoiled by the time they were transported here.

After word of what exactly we were doing got out the mayor among many other community members have come to the school to view our project. The initial impression left on our visitors is a sense of wow and amazement at the amount of work we've put into this project and the success that it is having. The mayor also stated that as the population of our town is decreasing so rapidly, the number of students much like the jobs in our community is also decreasing. Thus both the students and community members could work together on this project to help it grow while also creating new jobs.