Research Question

The following is a final summation of our semester project for the spring of 2012. Throughout the semester we have based our project on the question, what is the most effective way to determine whether a project for the Lafayette College Farm/Garden is feasible or not feasible. We used this question to create and reference map that helps determine how feasible a project for the Lafayette College Farm/Garden is.

Background Context

Throughout the semester we conducted preliminary research on community gardens and their positive or negative impact on the local inhabitants. We felt that this research would give us a solid understanding of the community garden here at Lafayette College. Most research involving community gardens was positive. Researchers felt that the presence of community gardens helps bring communities together and emphasizes the need for local food distribution. There were also some opposing views expressed. These authors felt that community gardens are simply a fad, and not a movement to help the local farming communities. An effective study by Laura DeLind focused on whether the local farm movement is just a trend to follow or if it will make a real difference. She concluded that that purchasing and growing local foods is an efficient idea, but cannot be completely controlled or forced. By this she meant that these farms could really make a difference in communities but need to be carefully developed and accessible to all community members. A second study by Alan Clavin presented the physiological positives that community farms or gardens can have on those who work there or plant there. He used three pillars to describe the most efficient way to achieve positive outcomes from a community farm. The three pillars consist of; caring for the earth, caring for the people, and devoting a small amount of money as a base. This view was helpful for our research because it provided a foundation for a productive and happy garden. In our case the Lafayette College Farm is small plot that consists of these three pillars and creates positive connections for all members of the community who use it.

After solidifying our understanding of community gardens and farms and how they work, we immersed ourselves in research of basic systems engineering. This information helped us form a reference map that can be used by faculty and students. All the research regarding systems engineering was taken directly from textbooks. There were no studies or research reports used.
Overall, the three main sources we used focused on how to create an effective system by using the specific details that merge several projects together.

Lastly, to create the reference map we looked at five current project proposals for the Lafayette College Farm/Garden. We chose the top five projects from a list of on-going and potential projects at the college farm. We needed to ensure that they were projects that had a long-term mission of providing healthy food to the community, the ability to nurture multidisciplinary student engagement through classroom participation, and be able to provide academic research opportunities. The top five projects we researched were weed management, a small-scale hydroponic feasibility study, a greenhouse feasibility study, sustainable infrastructure design, and farm stand selling. We focused on gathering information and making reasonable estimates based on criteria, which included, the number of people involved, cost, duration, and sustainability. Next we evaluated each project. For hydroponic feasibility, one student is currently working on a small-scale hydroponic study. He spent one semester on it and will continue research during the next semester. The highest recurring cost will be on replenishing the fertilizer but this is fairly inexpensive, totaling approximately fifty dollars. The second project, farm stand selling would need to run by approximately three people. The stand would operate during the fall when the crops are harvested. The only cost will be building the stand and minimal travel expense. Weed management takes one to two students for the experimental phase, but for actual seed planting the process would take approximately ten volunteer students, possibly from the LEAP organization. In terms of duration, it requires at least one year of testing and at least one more year to compare the data before reaching a conclusion. The cost is dependent on the types of weeds that are tested, but would still be in a reasonable range. A small-scale greenhouse feasibility study needs two to three people for the initial research and then five to ten people to actually create a small-scale green house replica. This replica would cost approximately $10,000 dollars, which decreases the feasibility due to budget constraints. It would be possible to cut the cost by building a replica from scratch. Lastly, the infrastructure design project would have the greatest cost and the largest number of people involved, both factors making it less likely to be completed in the near future. However, it would have a long lifetime and would be developed to be as sustainable as possible.

After researching each of the five project proposals, our preliminary studies for the capstone were completed. When then began to create our final product for presentation.

**Methods**

To conduct this research capstone project, we started by contacting Jennifer Bell, the Lafayette College Farm/Garden manager. She gave us a tour of the garden and described the projects in progress and the current project proposals. Jenn’s involvement was pivotal throughout the project. She provided insight about each project and what the feasibility might be. She also helped with deciding on the design and where the final product would be located.
After initially reaching out to Jenn Bell, we then used her as an important reference throughout the project. After developing a base of understanding of our own community garden, we began to work with Lijuan Xu on retrieving productive information sources about community gardens throughout the United States and abroad. She assisted in finding our sources and made sure we understood the importance of each.

**CONCLUSIONS AND OUTCOMES**

The final product of our project is a poster, which includes a map of how to critique a college farm project proposal based on four factors; cost, number of people, lifetime, and sustainability. The poster will be hung at the garden for any community member to use. The poster was created for any Lafayette College student, staff, or faculty to use, and is simple and easy to follow. The criteria we have developed includes the lifetime of a project, the number of people involved, the project cost, and project sustainability. Each criteria is then branched off into either a feasible category or a not feasible category. We have provided a description of what makes a project feasible or not feasible according to each specific criteria. You can then rate the total project proposal on a 1 – 20 scale, with 1 being the most feasible rating and 20 being the least feasible. If a project is rated between 1 and 10 it is most likely feasible for the farm to complete. If it is rated between 10 and 20 the project proposal is not currently realistic for the Lafayette Community Farm/Garden to invest in.

We wanted to provide an assessment methodology for students conducting research on the student farm to create a reference framework. They will be able to use the method as a checklist when conducting research. We have included several copies of the poster in the appendices. ?? Refer to the image for the actual reference map used to rate project proposals. If students use the map correctly they will be able to determine whether the proposal is feasible or not. We have also made smaller replicas of our map to raise awareness around school. They are displayed in Farinon, Acopian, and the Skillman library. These locations were chosen so that the maximum number of students would see them.

Lastly, for the final portion of the project we chose one of the five projects at the most feasible. After researching each project in terms of sustainability, lifetime, number of people involved, and cost, we gave each project a rating depending on whether the project was feasible or not. The outcome was the most feasible project for the Lafayette College Community Farm/ Garden is the farm stand selling project. The project rated at approximately at 5 points. The project involves minimal cost and would turn a profit for the farm. It also does not use energy to man the stand. The only cost would be an expense to transport the stand and produce to a busy and populated location.

Overall, determining the most feasible project for the Lafayette College Community Garden/Farm was the summation of our semester capstone project. We hope that the map will help push the garden towards greater development and improvement. Our goal was to find a way to integrate organizational skills into the proposals being presented to the farm. We feel that the
map creates a clear pathway for further progress of the farm and the opportunity to incorporate new projects for continued development.

**RECOMMENDED NEXT STEPS**

If this project were to continue, the next step would be for a student to begin preliminary research on the most feasible project. A student would necessarily determine a solid base cost, a lifetime of the project, the number of people required to complete the project, and an assessment of how sustainable is the project would be. Once reliable data for each criteria is determined a student would run the project through the feasibility map to determine its exact rating and whether it is ready for the development stage.

A second step would need to be taken in the future is the constant updating of the feasibility map. Right now the map uses numbers that are currently relevant for the farm. In the future the numbers will likely change and when they do the map must be revised. A regular update of the map will help promote development of the farm and remind students and faculty to recommend projects to improve the farm.

**APPENDIX A**

Appendix A consists of 20 annotated sources obtained during research this semester.


This report as an executive summary describes the operations of Missouri’s Green Hill Farm Project, which is a locally organized farmer network organization. Based on the interview with the core members of the organization, it offers open-ended ideas which can inspire upon us for future research directions. The first section of the article included their financing method and regular operations. It also emphasized the farm-university relationship which is a key factor in studying our organic garden. By studying the relationship between the two, we can get a level of understanding of the functions of the garden and its connections with the college and ultimately make recommendations.

**Beekman, . (20100702). Taking hands with a farm-school community in a career development project with a university department. Education as Change, 14, 57.**

This article tells about a small, single-day event in a school-university partnership, evaluating the outcome of the information and career guidance event. It argues that the event was mutually beneficial for educational psychology students and for the pupils who participated. The pupils whose parents worked at the farm gained knowledge and learned more about their career opportunities. The teacher gained skills and experiences of teaching. The interned students
experienced psychological community and learned to apply their knowledge. The sponsor established a positive image in the community. The focus on career development through farming activities is inspiring to us, because the educational usage for our college has tremendous implications, for example, there could be a volunteer program that brings elementary students in to the farm and get them exposed to farming. This will help raise awareness on the origins of food and help correct behaviors of squandering food.


The article reports on the composting program initiated by the University of New Hampshire (UNH) in Durham. The reported included many pictures and flowchart of all the procedures in food scraps recycling cycle. Food wastes are collected from the university's dining facilities and from several local restaurants. Collected food scraps are composted at the UNH College of Life Sciences and Agriculture's Kingman Farm. Finished compost is then used in a campus garden, with produce coming back to the dining halls. This one case study is useful because it shows us the effectiveness of presenting outcomes in charts and also addresses the role organic garden in the overall food recycle loop in the college. Though the content is relatively preliminary, we can expand from this perspective and examine the college farm in a holistic way.


The article reported a study of 267 gardens across five cities in the United Kingdom in which variation in geographical and climatic factors had little bearing on the richness, diversity and composition of plant species. Therefore they propose that garden management is an important factor in determining garden characteristics. The article investigated potential associations between the uses to which people put their gardens, the types of management activities they undertake, and the characteristics of those gardens. The article included lots of data and graphs to support their hypothesis. It is pedagogical but not very practical. What we at least can gain from this article is the notion of importance of garden management and the ecological benefits from small gardens. Also the article focuses on domestic gardens that are primarily of private householders, there are some paralleling factors in management of the Organic Garden of Lafayette College that we can do research on and provide suggestions on management.


The journal provides a comprehensive systematic approach of conducting a long-term agricultural systems study. The article argues that farming systems should be environmentally, economically, and socially sustainable. The Farming System Research Unit focuses on the long-term approaches that integrate the broad range of factors involved in agricultural. The goal is to provide the empirical framework to address landscape-scale issues that impact long-run sustainability of North Carolina's agriculture. They also contain data collection and analyses include soil parameters, pests and predators, crop factors, economic factors, and energy issues.
Experimental design and protocol are discussed, in addition to challenges and opportunities in designing and implementing long-term farming systems trials. This journal provides us with an excellent model to develop our organic farm portfolio with a focus on sustainability in environment, economic, and social aspects. There are challenges within the sustainability we need to be concerned about and there are also opportunities we can seize and develop.


The article illustrates how colleges’ cafeterias are buying organic food from college garden or local farms under the vision of “going green” on students’ menu. It offers valid statistics on the rank of US colleges or universities on their environmental initiative and also provides the lessons from some of the successful model of outstanding schools in this aspect. From this useful though very concise article, we can dig deep to find out more about what our peer colleges or universities have done. By comparison, we can learn from their successes and figure out some recommendations to improve our own organic farm. The article’s discussion on sustainability of canteen food recycle is a major benefit of organic garden, and can be studied further in elaborating what the benefits are. But no shortcomings are mentioned the article, such as economic impact of running such a utility etc. We can conduct our research about analysis on sustainability in economic, environmental and technological aspects.


Recently it has been discovered that the use of community gardens can both encourage sustainability as well as promote healthy eating and lifestyles to those using the gardens. This article helps give an understanding of the how community gardens create local sustainability through the growth of local good and displays reports on how these gardens can enhance the well being of those involved. The researcher completed the study by collecting data from five sites in the UK. To conclude the study, the researcher put together a table of principles that are incorporated with the creation of a community garden, both physical and psychological. With regard to the semester project, this study helps to give a great understanding of the importance of community gardens. Overall, it helps to show their purpose and how they can affect a community as a whole.

DeLind, L. (n.d). Are local food and the local food movement taking us where we want to go? Or are we hitching our wagons to the wrong stars?. *Agriculture and Human Values, 28*(2), 273-283.

With the movement towards purchasing local foods, it has been questioned whether this is a positive or negative ideal for the U.S. right now. To find an answer to this question DeLind completes a study in a “low income, urban neighborhood” to see whether the movement toward local foods and farms is beneficial. He uses the study to describe three mindsets when it comes to the local food movement and whether they are negative or positive. She concludes that purchasing and growing local foods is an efficient idea but cannot be completely controlled or forced. If forced, the local food movement loses its appeal and will push people in the opposite direction. It needs to be a chosen ideal for it to remain popular in
neighborhoods across the U.S. This article's connection to the semester project is that it provides basic ideologies about local foods and farming. It helps to further a knowledge base and will help with creating a criteria for the organization system.


To display the positives of the community or local gardens Firth, Maye and Pearson write an article in *Local Environment*. The article explains all the positive aspects of a community garden and the positive effects it can have. They conduct their research by interviewing and observing 6 community gardens around Gloucester, UK. Their research exhibits that there are two types of the community gardens, “place-based and interest based.” If the community garden is interest based it promotes bonds, local capital and the molding of a better community. Place-based is a more forced situation where less locals desire to be involved and it is simply in place to create revenue and promote local foods. Understanding the two types of community gardens and what type of garden is the most successful will help to further create a base to judge projects and proposals that the Lafayette community garden would like to undertake.


There are positives and negatives when colleges take on the responsibility of creating and maintaining a garden or farm. To develop an understanding of the pros and cons of college farms, Merrigan and Bailey conducted their research by studying “college to farm” programs at colleges in New England. They specifically focus on the college to farm program at Tufts University. The college to farm programs has the positives of promoting sustainability, involving the college community and students, and reducing fuel use with no delivery necessary. The negatives include minimal resources and funding, the inability to be completely self sufficient and the lack of help during the off time of school. This research piece has the most relevant information for the semester project; it provides a base of knowledge specifically about college gardens and farms. It will help to complete an understanding of college gardens and compare Tufts to Lafayette’s.


The following resource is a textbook that focuses on student farming and how it can promote different techniques for learning. As a whole the textbook gives a great general base on how students farms work and their affect on school environments. The textbook explains research taking place at liberal arts colleges throughout North America and local farming’s
affect on students at the colleges. For the project the most pivotal excerpts will be determined as we create a base to organize the projects. The textbook gives an excellent understanding of the affect on students at the colleges which will help to understand what projects will have the best affect on the students at Lafayette.


In a percentage of the public eye, the local food movement or press to buy organic seems like a social movement or trend rather than a push to make positive changes. This piece of research examines whether local foods are positive for our changing culture or a negative trend that doesn’t really make a difference. The researcher, Starr uses the social movement theory to determine what exactly the effects of local food purchasing are. He concludes that their a positive and negative attributes to the local farm, but to have a fully effective and sustainable local farm, different measures have to be taken and in the proper manner. This piece of the research is the most effective base to understand exactly how an effective local farm would work and what effects it would have on the surrounding community.

**APPENDIX B**

The following is a display of our final product for our semester capstone project. To create the poster we used PowerPoint.

The feasibility map was created with the Lafayette College Community Garden in mind. We wanted to create a map that could help determine whether projects proposed by the team would be feasible or not. We used techniques from engineering to create a system that will help organize the project proposals for the garden and hopefully help projects begin a development stage.
The final appendix is a list of the project proposals sent by Jenn Bell during preliminary research. From this list we narrowed down the top five projects.

Idea for student research:

1. Weed Management Plan

2. Beekeeping Feasibility Study
   a. Location
   b. How to install
      i. Box, bees, other materials needed
   c. How to care
   d. Costs initial and ongoing
   e. Harvesting honey and how to sell
   f. Others schools with beekeeping programs

3. Hydroponic Feasibility Study for seed starting
   a. Location: temporary and permanent
   b. Amount
   c. How to start, scale up
   d. What to plant
   e. Materials and Costs

4. Greenhouse Feasibility Study
   a. Types and cost ranges
   b. How to build, materials needed
   c. How to maintain
   d. Location
   e. Eco-friendly

5. Marketing Plan/Business Plan Development

6. Art:
   a. Plan and creation of mural
   b. Develop logo design competition
   c. Other art installation ideas and course integration

7. Sustainable Infrastructure Design
   a. Pathways within garden
   b. Access: Parking, road, future development
   c. New barn construction
      i. Wash station
      ii. Bathroom
      iii. Walk in refrigerator
   d. Farm house remodeling
i. Apartment upstairs for manager, kitchen, and meeting room

8. Farm Stand Selling
   a. Efficiency in delivery, set up, selling, and take down
   b. Materials and costs
   c. Design and build farm stand baskets that are light weight, easily stored, and appealing to look at
   d. Signage and marketing ideas