UBC Social Ecological Economic Development Studies (SEEDS) Student Report

THE SUSTAINABILITY OF THE UBC FOOD SYSTEM

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GROUP 16

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1.0 Executive Summary

The University of British Columbia is a small subsystem within Vancouver, which in turn is a smaller subsystem of the Lower Mainland. Due to the increase in population on campus, there is an increase in pressure on the ecosystem. To decrease the ecological footprint, UBC as a system, must analyze and take responsibility for the social, ecological, and economic impacts.

This proposal concerns changing the current structure and ideology of the subsystems within the UBC campus towards a more sustainable, interconnected system. Through the *Stages of Change Model* this transition will flow smoothly and work at the speed of every party involved.

All stages of the model can work concurrently with each other due to the complexity of each subsystem currently at UBC. The flexibility of this model allows for a gradual change that will increase the likelihood that the transition will be smooth and permanent.

Sustainability can be achieved at UBC if the impacts of the social, ecological, and economic perspectives are taken into account.

2.0 Introduction

"*To learn how to live graciously together would make us worthy of this unique, beautiful blue planet that evolved in its present splendor over some billions of years, a planet that we should give over to our children with the assurance that this great community of the living will lavish upon them the care that it has bestowed so abundantly upon ourselves*"

Thomas Berry ("Ecological and Economic Sustainability")

This quotation is especially appropriate when addressing the important issue of sustainability. It is important to maintain a sustainable community to ensure the needs of future generations are met for centuries to come. We feel that the current policies of the subsystems within UBC's food system, including those leading to a lack of usage of resources we already possess in our community, do not contribute to the sustainability of the UBC food system because there is no proper tool to analyse, assess and change these policies. To rectify the situation, this paper will try to address the issues that surround the sustainability of the UBC food system through the proposition of our research tools. We will define the indicators and their relevance to UBC, the approaches and models to address the issue and research methods that will be able to succinctly measure sustainability. We will start this analysis by defining what the notion of sustainability means to us, then we will delve into more complicated areas of the issue.

3.0 Sustainability

3.1 General definition

The UN conference in 1987 defined sustainability as the ability to "meet present needs without compromising the ability of future generations to meet their needs"(Website: Defining Sustainability). A sustainable food system encompasses procedures [redacted] that work with natural processes to conserve resources. It promotes the resilience of our ecosystem by minimizing the environmental impact while taking economic factors into consideration. An unsustainable system on the other hand is a system that is unable to meet these requirements. Thus, it is important to take a three-pronged approach when addressing the issue of sustainability. It concerns the interactions between the social, economic and ecological perspectives [redacted] We will use indicators to classify the level of sustainability of UBC‘s food system. The use of indicators is a way to measure, indicate, and point out or to something with more or less exactness; something that is a sign, symptom or an index of something used to visually show the condition of a system. The indicators chosen will attempt to do four things. These include: addressing carrying capacity, relevance to the community, taking a long term view of progress and showing the link between economy, environment, and society [redacted]

[redacted]

3.2 Indicators: definitions and their context in UBC

3.2.1 Ecological

A system is ecologically sustainable when it can maintain the diversity of life and the basis of its productivity. An ecologically sustainable environment can be defined as “using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased." (“Ecological Sustainability” Western Australian Government [redacted]

Our first and major ecological indicator is *waste management*. When looking at waste management we picked three aspects. They are composting, packaging and recycling. These three aspects were chosen because they are easy to use and can give an empirical measure. For example, the amount of composting and recycling that is done at UBC including the UBC farm can be evaluated quantitatively. The amount of composting and recycling can be easily measured by weight compared to measuring the air quality around the campus. These two aspects also depend on the type of packaging that is used by the UBC food system. The amount of Styrofoam and other non-recyclable products affect the amount the food system recycles. The measurement of the number of paper cups used can be calculated using the amount ordered. These aspects of waste management can help us measure the level of sustainability in the food system. An individual can track the amount of external inputs, its cost of coming into the system and what the output wastes would be. With this knowledge, the actual

sustainability of the system can be assessed. These aspects of waste management also fall under the criteria of what makes a good indicator.

Our second major indicator is *energy management*. The amount of energy used in UBC's plant operations gives us an indication as to whether the food system at UBC is economically and environmentally sustainable. Energy can be easily measured. The amount of fuel used to operate cars, service vehicles, and landscaping equipment, plus the amount of electricity used to operate the actual operation plants and food services locations can be measured by assessing current energy and gas bills. This is important to see where the food system stands when using external resources that can affect the environment in the short and long term. [redacted]

3.2.2 Economic

A system is considered economically sustainable when it can meet the needs of the economy (achievement of profitability, ability for the business to continue efficient operations) while being able to take into consideration social and ecological factors.

In accessing sustainability, economics is an area that is widely used by different institutions because it is a quantitative subject [redacted] Therefore, it is an indicator that can easily

be measured, and the economic viability of a food system can be easily ascertained. We chose three major economic indicators which include *profitability, marketing and employment*. When we look at profitability as a whole we look at whether the food system is just breaking even or if it is gaining financially. A system is not sustainable if it incurs an economic loss, whether it is in the short or long term [redacted] When assessing this indicator we look to see whether pricing of food is reasonable for the community, and whether or not the costs of the external inputs coming into the food system exceed the money coming back in revenue. Profitability can also be found in income statements and balance sheets.

The second economic indicator, marketing, is also an essential element. The amount of corporate sponsoring and events held by UBC and the use of the grounds by different corporations, such as the movie industry, can promote economic growth and funding for the campus food system. This in turn can also create further employment within the universities boundaries. The growth from marketing can be measured and economic growth, which leads to economic sustainability, can be observed [redacted]

3.2.3 Social

The social dimension of sustainability encompasses political, cultural, and all other people-centered issues. Social sustainability is related to how we make choices that affect other humans in our "global

community." A system is considered socially sustainable when it can provide community information, services and facilities, community development opportunities, and cultural development initiatives. The social indicator that we chose to assess UBC's food system sustainability is *food security*. We choose this indicator because it ties in with the ecological and economic indicators as well. In order to see if the food system is sustainable the following criteria has to be evaluated. The first is whether the access to different food outlets is easily accessible to everyone, the second is whether the food provided is affordable, and the third is the availability of food (whether the food is available according to its demand at each of the food services outlet). Last but not least, the health benefits of the food provided must be measured, as health is an important concern of our group. Through surveys and price comparisons, this indicator can easily show whether the on campus food system is sustainable.

[redacted]

The social indicator ties all three indicators of sustainability together and at the same time falls under the criteria of what makes good indicator[redacted] Just as economic, ecological and social sustainability work together in the big picture of sustainability, the indicators we have chosen work together too.

[redacted]

4.0 Approaches

4.1 To conceptualize sustainability

When it comes to deciding whether or not a food system is sustainable, we as a group feel that this is either a yes or no issue. That is, a food system is sustainable, or it is not. However, although the broad concept of sustainability may be a "black" or "white" thing, we see that its separate components of ecological, social, and environmental sustainability can each be measured on a spectrum. That is, they are not "black" or "white" but instead fall within a range [redacted] To conceptualize this notion of indicators acting together to produce a sustainable community, it is important to consider figure 1.1 and 1.2 for an explanation.

In a perfect world (scenario #1) [redacted] a system that is in fact sustainable would have all three of these components (ecological, economic, and social indicators) working together at the same rate [redacted] In other words, they would all be in equal or in perfect alignment. Unfortunately, it is not a perfect world, so although this upper left hand side of the quadrant [redacted] see table [redacted] is the desired place, we feel that "perfect sustainability" is very difficult, if not impossible to achieve.

Scenario #2 [redacted] where the elements of sustainability are acting apart, but the system as a whole is still sustainable, is a place where more systems are likely to fall. In the case of UBC's food system, landing here [redacted] would mean that economic, ecological and environmental sustainability are not working at the same rate, and when measured separately may in fact not be sustainable at all. However, the strength of one makes up for

the weakness of another, and although the components ecological, economical and social sustainability are acting apart, the system as a whole is still achieving sustainability.

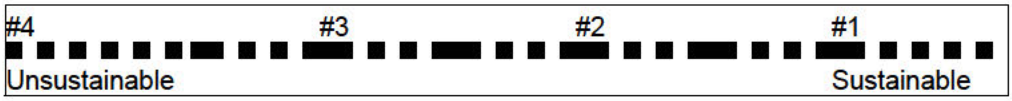
Scenarios #3 and #4 are unsustainable, regardless of whether the subsystems are acting together or apart. For whatever reason, all, one, or none of the components are not strong enough to make the grade, and overall sustainability is a "no go."

Figure 1.1: Definition of Sustainability.

	Acting Together	**Acting Apart**
Sustainable	#1: Elements acting together in a sustainable manner (Environmental, social, and economic sustainability working together equally)	#2: Elements acting apart, with some being sustainable, while others not being sustainable (Environmental, social, and economic sustainability not working together: unequal contributions to sustainability)
Unsustainable	#3: Elements acting together in an attempt to achieve sustainability but unable to do so on an individual or a group level. (Environmental, social, and economic sustainability working together equally to be unsustainable.)	#4: Elements acting apart, in an unsustainable manner (Environmental, social, and economic sustainability working in unequal contributions.)

The above conceptual diagram can be now placed appropriately on the continuum in figure 1.2 after assessing the sustainability of a food system and putting it in one of the above boxes.

Figure 1.2: On a continuum:



4.2 In the context of UBC

When evaluating UBC's food system, we as a group see that the three components of total sustainability (economic, social and environmental sustainability) are not working at equal rates. Rather, they function with compensatory mechanisms, or in "give up to gain" relationships. Therefore, UBC falls within the upper right hand corner of the quadrant (scenario #2).

We have deciphered ***(?)*** that a change in one of the three components, that is social, economical or environmental, will sub sequentially affect the other two. These constant fluctuations make the above described perfect alignment difficult (see scenario #1). Although the system is on the overall "sustainable" in the sense that it can continue to exist, it must be noted that all components are not working together equally. Therefore, the perfect sustainability described in our definition is not achieved. Even though it is UBC's sustainability pledge [redacted] ***)*** to improve all of social, economic and environmental sustainability continuously, the chances of this happening concurrently are rare. An improvement in one most likely means a loss in another area. Like UBC's sustainability circles, our model shows how environmental, social, and economical aspects are intertwined and cannot effectively work independently. [redacted]

4.3 Value Assumptions

As our group agrees as a whole that a bio-centric perspective should be adopted, we would like to see ecological sustainability adhered to as a priority. As we see UBC falling in the upper right hand quadrant of our chart (scenario #2), with some interaction between the three indicators, we believe that

it is possible to redirect focus from primarily the economic and possibly the social indicators in order to channel more resources towards maintaining an ecologically sustainable environment. For example, ecological sustainability should be a focus (e.g. use more recycled products) even if it means that economic indicators decrease slightly (e.g. less profit because of increased costs). Thus, we believe that environmental side of things should gain to a point where the overall food system is still sustainable, but with a more equilibrated focus. Unfortunately, due to our capitalistic society, economic viability often becomes the strongest of the three, causing a inequality of distribution between the indicators and this often means that environmental sustainability comes in as the least important priority. For these reasons, our recommendations strive to change this and make ecological sustainability the emerging winner.

5.0 Analysis of the Present and the Future

5.1 Stages of Change Model

There are five stages of change in this model. These will allow us to diagnose UBC today in terms of effort and speculate what it will be working towards in the future. [redacted]

The first stage is called the Pre-contemplation Stage and, when applied to UBC, it is characterized by a disinterest in change and a complete unawareness of sustainability. The second stage is the Contemplation Stage, and it is where the participants are beginning to think about change, perhaps changing within six months. The third stage is the Preparation stage. This is a very important stage

and here there is a definite plan to start changing within a month. Action is the fourth stage and it is self-explanatory. The final stage is Maintenance and this implies the continuation of what is working in keeping with the change, and removing what is not.

Step 1 – Identify Subsystems Within UBC Boundary

First UBC will need to be broken down into subsystems so that it will be easier to identify which parts of the system are functioning in a sustainable manner, and which ones are not. Small steps need to be implemented in order to change the larger UBC system. In a broader sense, it is also important to observe the UBC food system in the context of Vancouver as a society and British Columbia, in relation to Canada and the rest of the world.

By breaking down UBC into sub-systems, we in effect set parameters to each system. For example, this could include the following: the residence food system, UBC farm, transportation, UBC administration, AMS, etc.

Step 2 – Analyze Subsystem Policies for Sustainability

Each of these subsystems will need to be analyzed for where their policies stand on sustainability. This can be done using a survey (see Appendix). Some may fall within the Pre-contemplation stage, while others, such as the Sustainability Office, may already be in the Action stage.

Step 3 – Group Each Subsystem into One of the 5 Stages

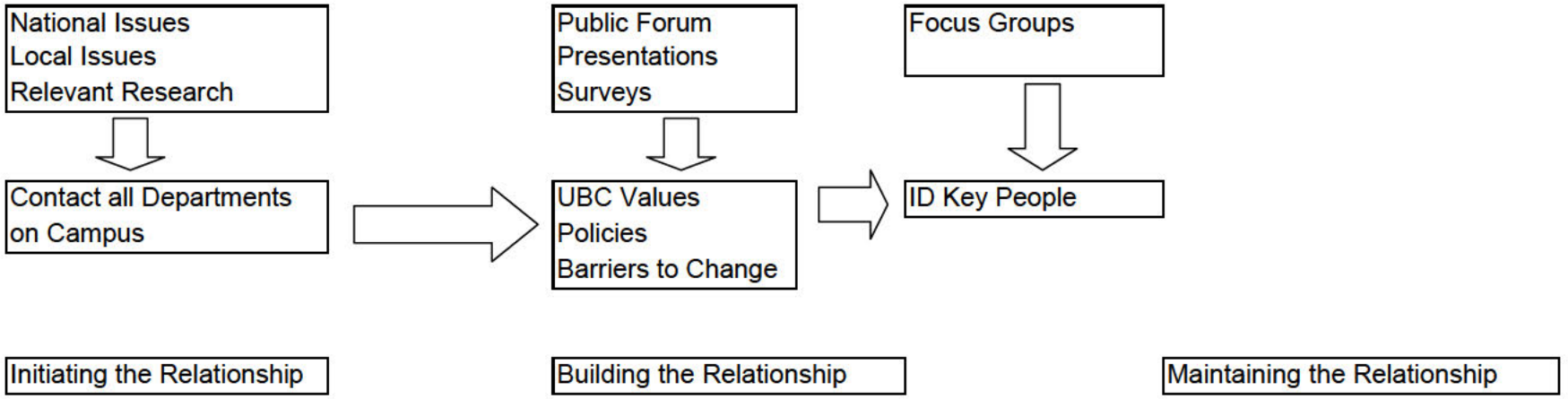
Based on the survey, each subsystem can be grouped into one of the five stages and then the head of each department can be contacted. Establishing a rapport and building an open relationship with them key. Without communication and trust the movement towards sustainability, if at all, will be slow.

Step 4 – Target Each Stage With a Specific Message

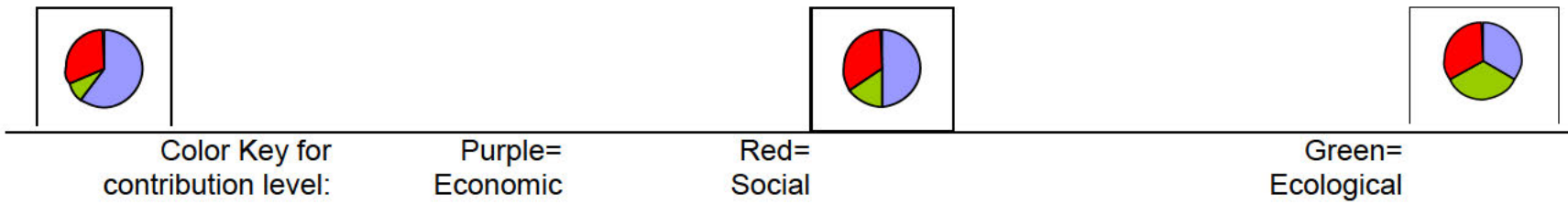
- The Pre-contemplation stage will be targeted with information that increases their awareness about sustainability indicators at UBC. The information will also have to explain why change is important and what specifically they can do about it.
- Subsystems that fall within the Contemplation stage should receive incentives to enforce their old positive behavior, and there should be an emphasis on adopting new positive behaviors.
- The groups within the Preparation stage should be provided specific information about how to change and choices to support which changes they are willing to make.
- Within the Action stage encouragement, reinforcement, and support are needed, with the development of strategies that lead into the Maintenance stage.
- Key steps to success for sustainability are the commitment to open communication between all levels of the subsystems and identifying the barriers to change.

5.2 Model in the context of UBC

Stages of Change Model and Timeline



Precontemplation	Contemplation	Preparation	Action	Maintenance
Unsustainable		**UBC**		**Sustainable**



6.0 Research Methods

6.1 Data Collection Methodologies

The main methods of data collection chosen were sample surveys and focus groups. These surveys are critical tools since they provide population-based estimates. There are two types of surveys that were focused on, quantitative (shown in appendix section 10.1) and quantitative (shown in appendix section 10.2). Each research method has its strengths and weaknesses [redacted]. However, together we believe that it will give a strong representation as to how the UBC community views sustainability [redacted]

Qualitative methods for data collection play an important role in impact evaluation by providing information useful to understand the processes behind observed results and assess changes in people's perceptions of the UBC food system. Furthermore, qualitative methods can be used to improve the quality of survey-based quantitative evaluations by helping generate evaluation hypothesis, strengthening the design of survey questionnaires and expanding or clarifying quantitative evaluation findings (Good).

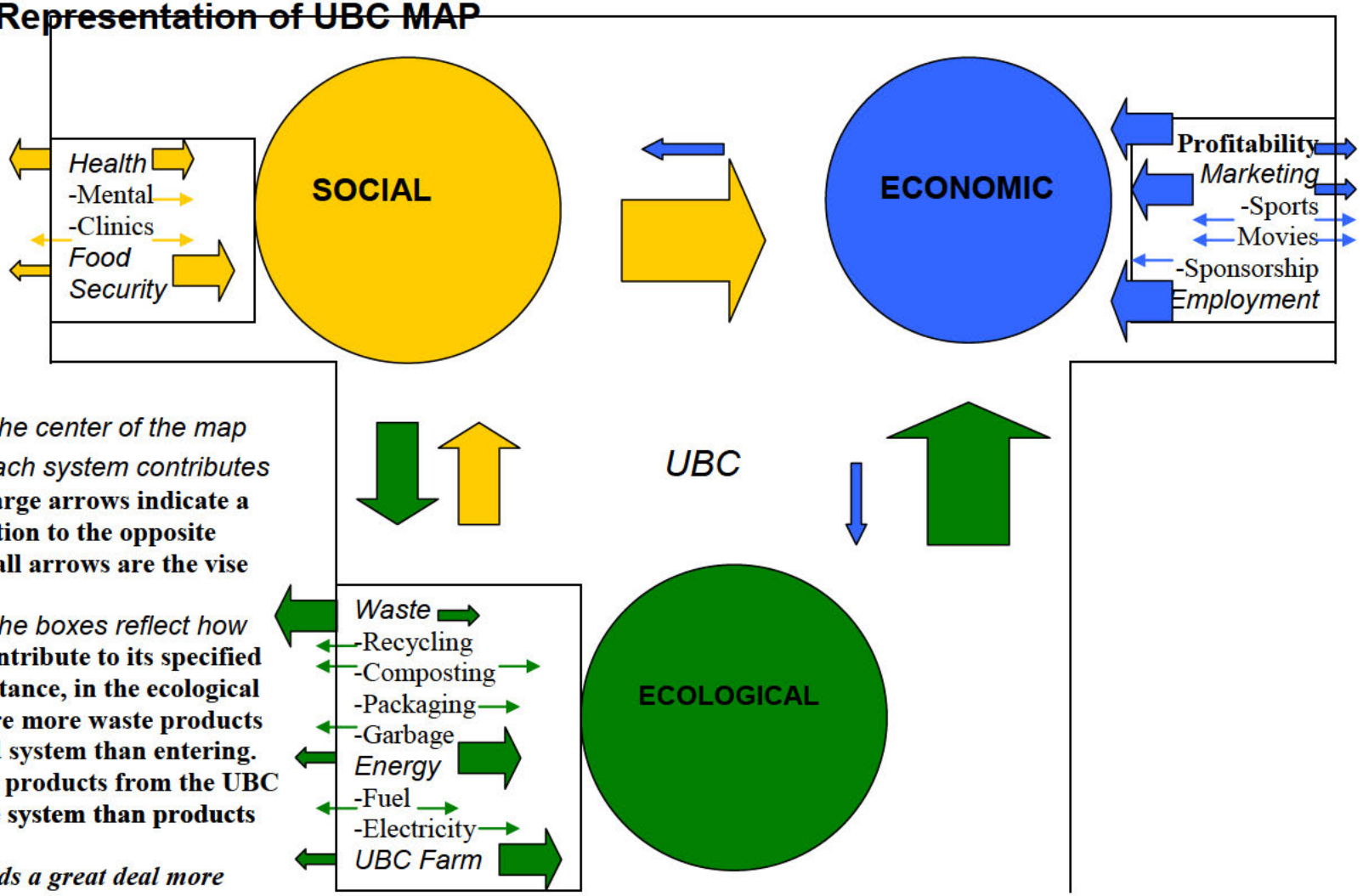
The quantitative research methods will include surveys that are "cross-sectional or longitudinal" [redacted]. The focus will be on questions that can be judged by a strongly agree, disagree basis. The qualitative research methods will focus on questions that will urge those participating to express their feeling in a narrative format [redacted]. Both these methods can be done over a period of time reflecting whether the "Stages of Change" have been effective. This will also show if there is an equal

weighting in sustainability of the ecological, economic and social systems [redacted]

Focus groups are also important because they are designed to build and maintain the relationships already established with key players in the UBC food system. This relatively informal atmosphere will help to identify areas that have not been addressed in previous surveys that are important for each key individual, as well as providing an opportunity for feedback as to what is working or not. This research method is an important tool for building trust and maintaining open communication between all members of the UBC food system [redacted]

Other data collection techniques may include questionnaires to other members of the community, and interviews with professors or other contributors to the systems such as plant operations. It may be possible to incorporate other experimental treatments that may better reflect each of the three systems and their subsequent subsystems.

7.0 Visual Representation of UBC MAP



The arrows in the center of the map indicate how each system contributes **to the other. Large arrows indicate a larger contribution to the opposite system, and small arrows are the vise versa.**

The arrows in the boxes reflect how **these factors contribute to its specified system. For instance, in the ecological system, there are more waste products leaving the food system than entering. Similarly, more products from the UBC farm stay in the system than products distributed out.**

(This model needs a great deal more discussion. You are leaving too much for the interpretation of the reader.

OUTSIDE UBC BOUNDARIES

8.0 Summary and Final Thoughts

Our group does not consider UBC sustainable as a whole system. We have found that the economic indicators are more heavily weighted in importance and the ecologic indicators are falling short. We hope that that we can aid in these assessments leading to future changes through the research tools and the information provided in this paper. We stress that there needs to be more research done on the current policies at the UBC subsystem levels in order for positive and permanent change to occur.

9.0 Recommendations

1 Start at the policy level to raise awareness of sustainability. What is it? Why it is important? Introduce it to all levels and sectors of UBC subsystems.

2 In order to increase the sustainability of ecological systems, it is necessary to decrease the sustainability of economic systems. Using funds from the economic system and utilizing them in, for instance, waste management or fossil fuel control can do this. For this to happen, it is imperative to increase communication between all levels.

3 Implement a waste restriction level. A certain percentage of products coming into UBC must have recyclable packaging. If the amount of waste disposed of from a facility exceeds a certain weight or number of bags permitted they will be charged accordingly for excessive disposal.

Moneys gained from this charge must then be put back into the waste management program.

4 Profits from the economic system must be put back into the university for waste management, research and development, more courses, more professors, more teaching assistants, expanding the sustainability office, etc.

5 Increase the impact of the UBC Farm by having its food directly contribute to the UBC food system. Promote the farm by increasing community awareness and involvement.

6 Investigate sustainable sources outside of the system. Search in the environment near the UBC community for alternate inputs to substitute the less sustainable methods produced within the UBC food system.

10.0 Appendices

10.1 Sample Quantitative Survey

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	2	3	4	5

Circle the answer most appropriate to your knowledge.

1. UBC has a sustainable food system.	1	2	3	4	5
2. UBC has a good recycling program.	1	2	3	4	5
3. UBC utilizes its resources effectively.	1	2	3	4	5
4. UBC has a wide variety of food outlets.	1	2	3	4	5
5. UBC food outlets are easily accessible.	1	2	3	4	5
6. UBC promotes waste minimization.	1	2	3	4	5
7. UBC is economically sustainable.	1	2	3	4	5
8. UBC is ecologically sustainable.	1	2	3	4	5
9. UBC is socially sustainable.	1	2	3	4	5
10. UBC uses its profits to improve ecological sustainability.	1	2	3	4	5

10.2 Sample Qualitative Survey

1. What is sustainability?

_____
_____
_____
_____

2. What makes the UBC food system sustainable, or unsustainable?

_____
_____
_____
_____

3. How can UBC improve its recycling program?

_____
_____
_____
_____

4. How can UBC better promote waste management?

_____
_____
_____
_____

5. Where is the UBC Farm?

_____
_____
_____
_____

6. How can UBC increase the impact of the UBC Farm?

_____
_____
_____
_____

11.0 References *Where are the many resources given or made available to you in your course manual/reader and WebCT?*

"Successful Strategies for Food System Change: New Rules or Market Populism?". University of Cornell
http://www.cals.cornell.edu/agfoodcommunity/fap/StratForFoodSystChange.pdf

"Defining Sustainability"
http://www.arch.wsu.edu/sustain/defnsust.htm

"Ecological Sustainability" Western Australian Government: Railways Commission
http://www.newmetrorail.wa.gov.au/html/m08s07_.php

"Ecological and Economic Sustainability"
http://www.twb.catholic.edu.au/sose/ecological_and_economic_sustaina.htm

City of Marion: "Sustainability indicators (social sustainability)"
http://www.marion.sa.gov.au/Web/webmar.nsf/Lookup/Social+Sustainability

"Concepts of Sustainability". University of Wyoming: College of Agriculture
http://www.uwyo.edu/AGadmin/SustainableAg/Concept.htm

Northern Arizona University: Methods of Data Collection
http://www.prm.nau.edu/prm447/methods_of_data_collection_lesson.htm

The World Bank Group: Data Collection Methods
http://www.worldbank.org/poverty/impact/methods/datacoll.htm

State Children's Health Insurance Program: Data Collection Methods
http://www.ahcpr.gov/chip/content/monitoring_evaluation/data_collection_methods-1.htm