UBC Social Ecological Economic Development Studies (SEEDS) Student Report

Scenario 2A: The True Costs of Food

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Group 10
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ABSTRACT

The purpose of this study was to assess the true cost of food at UBC. To do this, we created a set of indicators to evaluate negative externalities within the food system, using the model provided by 2003's group 9 as a framework for our study. We determined that measuring externalities is a complex process. However, it is an important component of research into sustainability at UBC. Thus, we chose six indicators that we felt covered some of the most significant externalities associated with our food system. It will be important for future AGSC 450 classes to acknowledge the existence of these externalities, and our indicators will provide a basis upon which to analyze food system externalities in future studies.

INTRODUCTION

The UBC food system is currently unsustainable. A sustainable food system, as defined by the United Nations World Commission, "meets the needs of the present without compromising the ability of future generations to meet their own needs" (Kloppenburg et al. 2000). It is our hope that the future students of AGSC 450 can use the indicators we have developed to assess the current status of the true cost of food within the UBC food system and use the label system we propose to encourage the UBC community to support food production practices that minimize external costs and enhance sustainability.

We chose to use the model presented by group 9 (2003), as we respected their group values, felt that their vision of the food system was compatible with ours, and believed that their model was the most useful in interpreting the true cost of food. As a group we feel that the ecological, social, and economic sustainability of the food system is linked and we respected group 9's attempt to create indicators to represent this link. While we felt it was important to develop some of our own indicators that were more specific to defining the true cost of food, we developed them so they could be applied in the visual model presented by group 9 (2003).

Examining the true cost of food is an essential step in the process of creating a sustainable food system at UBC. This step aims to bring all of the externalities, or hidden costs of food production, to light so that producers and consumers of the food at UBC can consider these hidden costs and aim to reduce and ultimately eliminate them. External costs of a food system include ecological, social, and economic costs such as fossil fuel use, social inequity and economic distancing. A commodity chain analysis investigates

all of the steps of food production from farm to table, and can be used to help uncover the true cost of food.

We chose six indicators to examine the true cost of food. We felt that there were many varied externalities, and thus using several indicators would be more indicative of true costs. To examine the ecological sustainability of the food costs, we used food mileage and farm water quality as indicators. To examine the social sustainability of food costs, we used student, faculty, and staff knowledge of externalities as well as the percent of profit return to the farmer as indicators. To examine the economic sustainability of food costs, we used the profitability of the AMS and UBC food services and the amount of local economic cycling as indicators.

It is our hope that the students of next year's AGSC 450 class use the indicators we have developed, in conjunction with the visual representation of group 9's AMOEBA model (2003), to assess the true costs associated with the foods that are offered by the AMS and UBC food services and determine which areas of sustainability need the most improvement. We feel this will be a major undertaking for this class, and it would not be practical to attempt to assess all of the foods on campus. We propose that our colleagues next year select a few food items and assess the costs associated with them using the given indicators.

Finally, to complete our vision, we have developed a labelling system that we propose be used by the AMS and UBC food services to mark products that meet a stringent set of criteria aimed at reducing external food costs. Products marked by the label would have low ecological, social and economic external costs associated with them and would be a good choice for the consumer. While the label is a simple design, we propose that an advertising campaign that uses posters and pamphlets that explain

commodity chain analysis and true cost of food should be distributed around campus to increase awareness. While we do not envision the label being practically employed next year, we hope that it will be a part of the 5-year plan to increase the sustainability of the UBC food system.

VALUE ASSUMPTIONS

Our group decided that acknowledging the value assumptions we held was highly important during our evaluation of the UBC food system. These value assumptions affect our opinions and points of view on every issue that we approach. After careful discussion, we realized that we viewed the food system through the lens of holistic anthropocentrism.

Holistic anthropocentrism is not a traditional term used to describe value assumptions; strong and weak anthropocentrism are more commonly seen. Strong anthropocentrism is the condition of viewing humans and humanity as the most important factor on the Earth (Connolly, 1997). As a result, strong anthropocentrics tend to focus on remediating human problems at the cost of other system components (e.g. the environment). Weak anthropocentrics value human health and prosperity over other factors, but place emphasis on other factors such as environmental health as well (Connolly, 1997).

Our group put great importance on systemic understanding. By understanding the system that humans and food systems are a part of, we can better hope to achieve a position of balance within that system rather than causing system disruption. We recognize that human health is invariably dependent on the proper functioning of natural system within which we exist. Without nutrient cycling, resource management and ecosystem health, humans will not be able to survive on the Earth. Holistic

anthropocentrism is the value assumption that acknowledges this relationship. While it is still based on human survival, it recognizes that human survival cannot continue without a respect and understanding of the greater natural system that encompasses us.

To this effect, we used holistic anthropocentrism to evaluate the UBC food system. We realized that this system could not be made sustainable unless we acknowledged that it is invariably dependent on and irrevocably interlinked with the larger system that is our natural world.

COMMODITY CHAIN ANALYSIS

The global commodity chain is a concept that has been developed out of world systems theory. Hopkins and Wallerstein define it as a "network of labour and production processes whose end result is a finished commodity" (Appelbaum, 2004). Commodity chain analysis is an essential tool for examining the true cost of food. It characterizes a number of nodes or operations where particular production and processing practices take place. These "nodes" include input acquisition, manufacturing, distribution, marketing, and consumption (Fundation Nicaragüense Pro Desarrollo Comunitario Integral, 2002).

A global commodity chain is composed of complex webs of contracts and sub-contracts dominated by key agents (Gwynne, 1999). Production in one part of the world economy can be linked through these contracts and agencies to the consumption of that product in other global locations (Gwynne, 1999). From processing to consumption, commodity chains are sites of continuous capital exchange and accumulation (Fundation Nicaragüense Pro Desarrollo Comunitario Integral, 2002). Each stage in the commodity chain contributes an additional value to the final product that is primarily governed by the key agents.

Thus, a commodity chain analysis is an interdisciplinary approach that attempts to understand the links between producers and consumers by tracing the connections between the nodes at different points along the chain. This allows a researcher to determine the history of a given product from farm to plate, and provides the data necessary to determine all the externalities that are associated with it. After determining such externalities, an attempt to quantify them may provide an approximation of the true cost of that item.

THE TRUE COST OF FOOD

The true cost of food includes both the direct and indirect costs associated with food. Food production, processing, distribution, and consumption have profound ecological, social, and economic costs that are not reflected in the prices consumers pay for food. These hidden costs are termed externalities, and are the consequences of practices used in the food system. They are difficult to assign a dollar value to, but have associated costs that impact the sustainability of the food system. Farming practices, distribution distance, and the extent to which foods are processed and packaged, as well as the location in which this occurs, all have varying impacts on the sustainability of a food item. For example, food production may create waste and facilitate surface and ground water pollution. It can promote the salinization of irrigated land, cause depletion of fossil fuels, and destroy wetland and wildlife habitat, as well as reduce genetic diversity (National research council in Kloppenburg and Lezburg, 1996).

Food production, processing, distribution, and consumption also have many hidden social costs. The current global food system relies on a relatively small number of large-scale, industrialized farms that are highly mechanized and employ few people. Farmers receive little return for the foods they produce, as control of the food system

moves out of the hands of the local communities and into the hands of fewer and fewer multinational firms (Sexton and Welsh in Lyson and Green, 1999). Monoculture and associated pesticide and herbicide use can have many repercussions for farm employees. Likewise, people employed at processing, packaging, shipping and disposal facilities may face a variety of unethical working conditions. For consumers, further social costs can be associated with eating highly processed foods in the form of obesity and other health related issues.

Food production, processing, distribution and consumption have hidden economic costs as well. Lyson and Green (1999) explain that marketing and input supply firms, which are not attached to any given community, control food system assets. Furthermore, their profits are invested in institutions that are controlled by distant, anonymous stockholders (Lyson and Green, 1999). Thus, there is little local economic cycling at the community level. Farmers may be forced to use new production techniques, equipment, and crop varieties to increase yield and try to increase their profits because the competitive commodity market only gives them a small percentage of the consumer dollar spent on food (Pretty et al. 2001). Reduction of transportation, processing and distribution could substantially lower both the direct and indirect costs of food and increase the percentage of economic return to the farmer.

However, externalities do not necessarily have to be negative. Pretty offers the following example: while one agricultural system may deplete organic matter and erode the soil, another system may fix carbon in the soil. The latter contributes positively by mediating climate change and increasing the health of the soil (Pretty et al. 2001). Unfortunately, such positive externalities appear to be vastly outweighed by the negative externalities in many cases. Currently, the external costs of agriculture in the U.S. are

estimated at 34.7 billion dollars each year (Pretty et al. 2001). It is our hope that the AMS will preferentially utilize foods that enhance sustainability, and that this analysis provides them with tools to do so.

INDICATORS

Ecological

To assess the true ecological cost of food, our group chose two indicators: water quality within the regions where UBC's food is produced, and food mileage.

Water quality is an important indicator of ecological health, especially in a region that produces food. When agriculture negatively impacts the environment, the first sign of its disturbance is often a reduction in water quality (Gliessman, 2000). Our indicator will seek to measure the amount of agricultural runoff in the surrounding waterways. Runoff can include materials ranging from manure, fertilizer, and eroded soil to pesticides and other agrochemicals. These pollutants have costs to the natural ecosystem. Fertilizers and manures can cause harmful algal blooms due to increased nutrients within the water (Gliessman, 2000). Pesticides can accumulate within the natural food chain and kill organisms (Gliessman, 2000). Degraded water quality can also be dangerous to human and livestock health if consumed (Gliessman, 2000).

This indicator may be difficult to measure. It will involve investigating the source of food that is consumed at UBC, and then locating research and information on the water quality of the aforementioned region. These water quality reports will indicate the degree to which agriculture impacts water quality within the region, which in turn indicates the environmental responsibility (or lack thereof) of the farming practices in the area. This information can then help to determine the true ecological cost of the food consumed at UBC. Food that is produced in manner that degrades water quality will

have high environmental costs that can spill over into social costs. Conversely, agricultural production that maintains water quality will have low environmental and social costs.

Table 1.1: Breakdown of the water quality indicator

Water Quality	potable	5
(in the environment of food	Suitable for bathing	4
producers supplying UBC)	Suitable for livestock	3
	Suitable for irrigation	2
	Toxic	1

Food mileage is our second ecological indicator. Measuring food mileage can give consumers a more transparent account of fossil fuel consumption and carbon emissions. It is our belief that it is more ecologically sustainable when food travels the shortest possible distance from farm to table, yet produce travels 1300 miles on average in North America before being consumed (Kloppenburg et al, 1996). As suggested by group 14 (2003), we propose to measure food miles by first determining the source of various food items and then calculating how far, in kilometres, that source is from UBC. Surveying food outlets and asking managers and/or suppliers for clarification can determine the origins of items when sources are not provided on signs or labels. The source of each item at each outlet can be recorded, as can the distance of that source from UBC. Once food mileage has been calculated, these values can be used to help the AMS Food and Beverage Department, UBC Food Services, and UBC Village in the assessment of the importance of buying local produce. The food mileage of individual items or item categories may highlight specific areas for improvement.

Table 1.2: Breakdown of the food mileage indicator

Food Mileage	Produced at UBC	5
(distance food products travel)	< 200 km	4
	< 800 km	3
	< 2000 km	2
	> 2000 km	1

Economic

Two indicators were selected to show the economic aspects of the true cost of foods. Our group felt that profitability was a base indicator of economic sustainability for AMS and UBC Food Services operations, and that it was important that other revenue was kept local as well. Thus, we chose to measure the profitability of these food services operations, as well as the amount of local economic cycling.

Profits generated within the existing food system by the AMS and UBC Food Services can be explored in both the long and short term through analysis of the annual fiscal revenue of these two departments. After the deduction of the various costs in running the UBC food system, net profits give a clear indication of the economic sustainability of this food system from the retailer's perspective. The maintenance of economic profitability is a serious concern for both the AMS and UBC Food Services, and it must be recognized that a minimal level of profitability is required even as we attempt to internalize externalities associated with foods. It is also important to recognize the relationships that exist between the economic, social, and ecological factors in determining the true cost of foods. UBC's capacity to generate profits in their food and beverage sector helps to support the social and ecological aspects of the community and thus reflects this synergy.

Table 1.3: Breakdown of the Food Services profitability indicator

Food Services Profitability	> 5 cents/consumer dollar	5
	3-5 cents/consumer dollar	4
	1-3 cents/consumer dollar	3
	Break even	2
	Net loss	1

The second economic indicator of the true cost of food assesses local economic cycling. For this assessment, our group defined "local" as being within British Columbia. Examining the commodity chain and preferentially supporting local businesses can

measure the benefits of returning profits to the community. Imported foods provide little food security and social connection to the local community. It has been suggested that imported foods are often produced with monocropping practices, which have negative effects on the environment (Lyson and Green, 1999). Monocropping is also best suited to large-scale production, which provides economies of scale but is damaging to rural community structure and the livelihoods of small farmers (Lyson and Green 1999). On the other hand, locally grown, produced, and distributed foods, which are often produced on small scales, may provide more jobs in the agricultural market and can provide better working conditions and wages for local farmers because of their connection to the community (Kloppenburg et al. 2000). From the consumer perspective, such locally grown foods may be more expensive, but they are also often much fresher and there is security in understanding where one's food has come from and how it was produced (Feenstra, 1997). The social and environmental benefits of local food production help bring sustainability to the community (Kloppenburg et al. 2000). As well, an increase in purchasing local foods may eventually bring the direct costs of local foods to a level that is competitive with the global agricultural market. This effect has already been seen in the organic sector, where prices for many products have dropped significantly since the movement has become more popular with consumers.

Table 1.4: Breakdown of the local economic cycling indicator

Local Economic Cycling	> 90%	5
(amount of food production,	75%- 90%	4
processing, and sales through	50%- 75%	3
BC companies)	25%-50%	2
	< 25%	1

Social

The two indicators we have chosen to provide a measure of social externalities surrounding foods are awareness and knowledge of external costs and the social equity of profit distribution.

We feel that awareness is an important first step toward an appreciation of sustainability in general and the externalities associated with food specifically. Most people are unaware of, and thus perhaps unconcerned about, external costs such as land degradation, water pollution, and carbon emissions, all of which are connected with food production and distribution. Being informed about such issues is a precursor to taking deliberate action toward building a more sustainable community. We suggest measuring the awareness of externalized food costs at UBC with a survey of the UBC population, including community members, staff, faculty, and students. In particular, we would like to focus on the AMS Food and Beverages Department and UBC Food Services, as they are in control of a major portion of the food purchasing at UBC. It is important that the people who have a great deal of power over the food system at UBC are aware of the costs and benefits of their actions and are ready to make changes where feasible.

Table 1.5: Breakdown of the knowledge of externalities indicator

Knowledge of externalities	> 90%	5
(amongst the UBC community)	75%-90%	4
	50%-75%	3
	25%-50%	2
	< 25%	1

Our second indicator estimates the social equity of profits made within the food system. Ideally, we believe that the cost of food should reflect a sufficient portion of profit returning to the farmer so that he or she can maintain the farm environment, pay sufficient wages to any hired help, and contribute to the rural community. In trying to

support local producers and our local food system, we would like to view our food system as a foodshed, containing "commensal communities which encompass sustainable relationships both between people (those who eat together) and between people and the land (obtaining food without damage)" (Kloppenburg et al. 1996). In the United States, the average wheat farmer sees only 3.5% of a dollar for his or her produce (Pretty, 2001) and rural communities and farmers in general do not feel supported by those they feed. We will measure social equity by assessing the difference in profits received by the farmers (producers) of goods compared to the distributors in the UBC food system.

Table 1.6: Breakdown of the social equity indicator

Percentage of profit for farmers	> 40%	5
(as a portion of the consumer	30% - 40%	4
dollar spent)	20% - 30%	3
	10% - 20%	2
	< 10%	1

FOOD LABELLING SYSTEM

Our group chose "food origins" as one of our specific tasks, with the intent of developing a labelling system that can be used by both the AMS and UBC Food Services. The purpose of this label is to provide consumers with information about the true costs of the foods that they purchase at UBC. We felt that this label should be relatively easy to interpret for both food service personnel and consumers, in addition to providing useful indicators of the externalities associated with each food product. "An externality is any action that affects the welfare of or opportunities available to an individual or group... which can be either positive or negative" (Pretty et al. 2001). With the use of this label we hope to influence consumer awareness of the externalities associated with their foods, and encourage them to purchase food products that have minimal negative externalities, thus increasing the sustainability of the UBC Food System.

The externalities associated with foods encompass the three pillars of sustainability: social, ecological, and economic. Therefore, we feel that each of these components must be included on the label. To make this label as easy to read and interpret as possible we have chosen to list only four of the most significant and measurable externalities associated with the true cost of food.

We propose a label that can be applied to all food products. The label itself will contain the ecological criteria, food mileage and production practices (as reflected in water quality); the social criterion, percentage of the sale price returned to the farmer; and economic criterion, local economic cycling (as the percentage of a food product that has been produced locally).

In compliance with our true costs model, acceptable levels of externalities would be determined if the product receives a 4 or above on the scale of 1-5 in each of the four categories (see Appendix A). If it satisfies that requirement, a check mark will be placed on the label. All components of food products would be required to meet these base levels before receiving a check mark. In order to maintain integrity of the system, consistent criteria must be applied to all foods. As a side benefit, these labels will also help indicate the seasonality of foodstuffs that can be grown locally.

In conjunction with the AMS and UBC Food Services, it will be extremely important to launch an educational campaign throughout campus, so that all consumers are fully aware of what the label means. Foods that are checked off for all four of the indicators will represent products that have minimal negative externalities. By providing consumers with a new awareness about the origin of their food, they will be more inclined to make sustainable choices when choosing what they buy on campus.

CONCLUSIONS

All of our indicators were assessed using a commodity chain analysis. An analysis of the commodity chain will allow future groups to trace various foods within the UBC food

system back to their point of origin. Once this origin is known, future AGSC 450 students will be able to use group 9's model as well as the indicators our group has provided to assess the aspects of sustainability within the UBC food system that are related to externalized food costs. When the UBC community understands the concept of the true cost of food, the university will be able to move toward a more sustainable food system. This will require more effort than simply recognizing the externalities associated with the UBC food system, but we must first work to assess those externalities before attempting to reduce them to more sustainable levels. The label that our group has proposed is not one that can be used right away, but should be thought of as an implementation goal for future ASGC 450 students as well as the UBC Food and Beverage Services and the AMS.

REFERENCES

Appelbaum, R. P. 2004. Commodity Chains and Economic Development: One and a Half Proposals for Spatially-Oriented Research. Retrieved 15th March, 2004 from the world wide web: http://repositories.cdlib.org/cgi/viewcontent.cgi?article=1001&context=isber/cgs

Connelly, J. 1997. Politics of the Environment. http://www.ecomuseum.ithaca.ny.us/glossaryHamilineU.html. Last accessed March 16th, 2004

Feenstra, G. 1997. Local food systems and sustainable communities. American Journal of Alternative Agriculture. **12(1)**: 28-36.

Fundation Nicaragüense Pro Desarrollo Comunitario Integral. 2002. Nicaragua Case Study-Gendered Access: Commodity Chain Analysis of Non-timber Forest Products from Laguna de Apoyo Nature Reserve, Nicaragua. Retrieved 15th March, 2004 from the world wide web: http://www.widtech.org/Publications/nicaragua_case_study.pdf

Gliessman, S.R. 2000. *Agroecology: Ecological Processes and Methodology.* CRC Press, LLC. Boca Raton, FL. pp. 6-10.

Group 9. 2003. The UBC Food System: Indicators in the Measurement of Sustainability. AGSC 450. http://www.webct.ubc.ca/SCRIPT/agsc_450/scripts/serve_home

Group 14. 2003. The Sustainability of the UBC Food System: Collaborative Project II. AGSC 450. http://www.webct.ubc.ca/SCRIPT/agsc_450/scripts/serve_home

Gwynne, R. N. 1999. Globalization, Commodity Chains and Fruit Exporting regions in Chile. Tijdschrift voor Economische Geografie. **90(2):** 211-225.

Kloppenburg, J., J. Hendrickson, and G.W. Stevenson. 1996. Coming into the Foodshed. Agriculture and Human Values. **13(3):** 33-42.

Kloppenburg J., and Lezberg, S. 1996. Getting it straight brfore we eat ourselves to death: From food system to foodshed in the 21st century. Society and Natural Resources, **9**:93-96.

Kloppenburg J., Lezberg, S., De Master, K., Stevenson, G., and J. Hendrickson. 2000. Tasting Food, Tasting Sustainability: Defining the Attributed of an Alternative Food System with Competent, Ordinary People. Human Organization, **59(2)**: 177-186.

Lyson T., and Green J. 1999. The Agricultural Marketscape: A framework for sustaining agriculture and communities in the northeast. Journal of Sustainable Agriculture. **15(2/3)**.

Pretty, J. 2001. Some Benefits and Drawbacks of Local Food Production Systems. Briefing note for Sustain AgriFood Network, Nov. 2nd. AgriFood Network, London: 1-11.

Pretty J., Brett C., Gee D., Hine R., Mason C., Morison J., Rayment M., Van Der Bijl, G., and Thomas Dobbs. 2001. Policy and Practice: Policy challenges and priorities for internalizing the externalities of modern agriculture. Journal of Environmental Planning and Management, **44(2):** 263-283

Raikes, P., Jensen, M. F., and Ponte, S. 2000. Global Commodity Chain Analysis and the French Filiere Approach: Comparison and Critique. Economy-and-Society. **29(3)**: 390-417

Appendix A: Indicators of food cost externalities

Indicator	Criteria	Rating
Ecological		
Food Mileage	Produced at UBC	5
(distance food products travel)	< 200 km	4
	< 800 km	3
	< 2000 km	2
	> 2000 km	1
Water Quality	potable	5
(in the environment of food	Suitable for bathing	4
producers supplying UBC)	Suitable for livestock	3
	Suitable for irrigation	2
	Toxic	1
Social		
Knowledge of externalities	> 90%	5
(amongst the UBC community)	75%-90%	4
	50%-75%	3
	25%-50%	2
	< 25%	1
	25 %- 0%	1
Percentage of profit for farmers	> 40%	5
(as a percentage of the	30% - 40%	4
consumer dollar spent)	20% - 30%	3
	10% - 20%	2
	< 10%	1
Economic		
Local Economic Cycling	> 90%	5
(amount of food production,	75%- 90%	4
processing, and sales through	50%- 75%	3
BC companies)	25%-50%	2
	< 25%	1
Food Services Profitability	> 5 cents/consumer dollar	5
	3-5 cents/consumer dollar	4
	1-3 cents/consumer dollar	3
	Break even	2
	Net loss	1