Benchmarking Sustainability:
Preliminary Mapping of Progress with the University of British Columbia's Food System Project Past, Present and Five Years Ahead - 2011

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Abstract

This report represents research on the UBC Food System sustainability project for the Land, Food and Community III class within the faculty of Land and Food Systems. Since 2002, this project has generated a multitude of research reports and campus sustainability initiatives without having a system to track its progression in achieving greater or lesser sustainability. This Community Based Action Research project was given the specific task of mapping this progress from pre-determined indicators that attempt to measure its subsystems' and overall past and current status regarding sustainability. These subsystems include the UBC Food Services, Alma Mater Society, UBC Farm and UBC Waste Management. Benchmarks were then created as future goals for which the UBC food system− and its components− will strive to attain. These benchmarks were integrated into a model which acts as a 'visual framework' to portray the general vision of a sustainable UBC food system and secondly to document and evaluate the projects progress. It was determined that the two purposes of the model would be best embodied by two distinct representations. Borromean Rings, portraying the general vision can serve as an educational tool and an amoeba graph as a managerial one. The findings revealed that out of 31 indicators, 16 were preliminary benchmarked. The remaining 15 could not be benchmarked either because the data is not available or because the indicator itself needed to be re-assessed altogether. It was concluded that the benchmarking process would be more efficient if indicators were developed through a specific set of criteria before being benchmarked.

> *Better to be roughly right than precisely wrong.*
> --- Goodland, 1995

1.0 **Introduction – Problem Definition and Relation to Other Benchmarking Projects**

The UBC Food Systems Project (UBCFSP) is a collaborative five-year food systems sustainability assessment venture involving faculty and students in the Land, Food and Community III series within the Faculty of Land and Food Systems at the University of British Columbia. This project works with campus

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organizations to identify 'opportunities and barriers' that can be exploited or overcome by the ongoing efforts of the university's goal to become a more sustainable campus community (Brunetti 2002; Richer 2005). This is the fifth year of the project and 28 student groups are examining specific food related issues, with the exception of three groups whom have been given the task of 'measuring' the past, present and future progress of UBC's efforts in creating its own sustainable food system.

Various groups have coordinated numerous sustainability initiatives on the UBC campus. In the years 2003 and 2004, students of Agricultural Sciences 450 (AGSC450) created a three-pillared model of a sustainable UBC food system, which incorporated associated indicators to effectively record transitions in those criteria characterizing sustainability. This model's purpose is to act as a visual education tool portraying a general vision of a sustainable food system that assimilates healthy ecological, social and economic dimensions. The model also operates as a managerial instrument that effectively documents and evaluates to what extent specific aspects of the vision are being realized. One of this years work problems is to add a time scale– or chronological dimension– to the model. Further, our group has determined benchmarks– where possible– for the indicators that were prepared by last year's work. In order to develop the benchmarks, an information base for each indicator's past and current status was created. Challenges herein include generating valid and reproducible *measures* of the indicators, which produce that information base and allow us to make realistic and attainable goals, or benchmarks, for the future.

A university campus food system represents a microcosm of the regional food system. Universities also act as a portal for new knowledge that may enable us to live a more sustainable, earth-friendly existence– knowledge that societies desperately lack. To date, there are few examples of universities tracking their food systems as they implement sustainability initiatives, much less a city or region tracking such phenomena. California's Vivid Picture Project is the most representative in its attempt to incorporate benchmarking into their all-state food system project (ECOTRUST 2005; Mamen 2005). Benchmarking has

occurred on campuses for ecological foot printing (Stewart 2005; Penn State 2001), some of which contain indicators for their respective food system. There is a foreseeable demand for these projects to track their own progression as it allows for 'auto-evaluation' and modifications of those projects. Additionally, many of the indicators will carry far greater significance if they can be compared to other systems.

Benchmarking can bring about awareness that a goal or policy objective is needed (Munda 2005). Ultimately, mapping and benchmarking *relevant* and *measurable* UBC food system indicators will be most useful if they assist in policy decision making and initiatives which build a more sustainable system on a campus-wide level. A project of this magnitude requires a method to gauge its own successes and failures. This mapping and benchmarking of indicators will allow for an assessment of this success. Once this work has been achieved, any information, challenges or logistical gaps will be identified and formulated into recommendations for the project partners and future AGSC 450 students.

1.1 UBC Food System Vision Statement and Group Reflections

We have been asked to comment on the vision statement. Two versions of the vision statement have been created, a layperson's and an academic version. The academic version's 'Seven Guiding Principles of a Sustainable UBC Food System' as determined from the partner's consensus and past AGSC450 students input are (Richer, 2005):

1) Must protect and enhance the diversity and the integrity of the natural ecosystem that supports it. It must preserve the resources needed that can make it function indefinitely.

2) Relies on local inputs when possible, where inputs and waste are recycled and/or composted back into the system in which it originated.

3) Is a secure system that provides food that is culturally, ethically and nutritionally appropriate, affordable, available, accessible, socially just, safe and resilient.

4) Provides for healthy diets that do not compromise the ability of people to feed themselves or others in the present or in the future.

5) Nurtures feelings of community and promotes enjoyment of food around the food table.

6) Enhances feelings of community belonging which requires a heightened awareness of every component, from the point of production to end disposal.

7) Is based on *long-term* financial viability; contains a balance of imported and local foods whenever possible; uses foods that come from socially and ecologically conscious producers who receive fair prices for their products.

The academic adaptation described above seemed to misunderstand and therefore disregard certain economic variables that are necessary for the functioning of our food system. The vision seemed not to recognize peoples' food behaviour (versus food knowledge), which is primarily based on price, convenience and habit, and their resultant consumption that determines supply and demand. Moreover, our group felt the layperson's version was too vague and missed some of the key details of the vision statement. The UBC Food System is a diverse and highly complex system and its vision statement must clearly articulate all of these features without depreciating the system's intricacy and richness.

2.0 Methodology – Value Assumptions & Methods

This project depended upon collaboration with the project partners: the Alma Mater Society Food and Beverage Department (AMS), UBC Food Services (UBCFS), the Center for Sustainable Food Systems at the UBC Farm (UBC Farm), UBC Waste Management, and various student societies. This research was carried out through Community Based Action Research (CBAR) whereby all interested parties are treated as equal partners and as having equal stakes in the research at hand.

The subsequent findings and conclusions drawn from engaging with CBAR are very sensitive to the researchers' values, assumptions and biases. Our group began this research with the assumption that the partners' values are congruent with the UBC Food System Vision Statement and that the partners will incorporate more sustainable practices into their operations within a given time frame of five years. Furthermore, we assumed that a non-profit organization and/or student-run organization would inherently have fewer obstacles in achieving social sustainability than would a profit-driven organization like UBCFS.

Likewise, UBCFS would attain economic sustainability more easily when compared to AMS and the UBC Farm.

In this year's UBCFS project, three 'task groups' (of six to seven AGSC450 students) were appointed the mission as described by the problem definition. There are also three chief project partners or 'key players'— AMS, UBCFS and UBC Farm— for which sustainability indicators were created. The three task groups decided to work collaboratively by allocating two students to three 'working groups', each of which focused on just one key player. If there was a seventh student in a task group, this individual functioned as a facilitator that oversaw the task group's work. Working groups of six members could concentrate their efforts to produce a large and detailed information base for each key player while maintaining efficient and organized communication with that player. More specifically, each working group was responsible for creating questions for and meeting with their respective key player, gathering all necessary data concerning associated indicators, and drawing meaningful benchmarks. An additional benefit to this setup is that each task group— via two students— was directly exposed to all key players. This allowed for the majority of information to be 'first hand' and therefore more valid when drawing recommendations and conclusions. Upon completion of working group duties, individual task groups compiled the indicator research, modified benchmarks, assimilated them into a chosen model, and drew recommendations for the project partners, future AGSC450 students and the teaching team.

Through further research, our task group encountered the necessity for what the Vivid Picture Project declared as criteria for indicators. In order for indicators to be useful, they must be: measurable, stable, reliable and credible, comprehensible and practical, and their respective data must be accessible, cost-effective to gather and responsive to change within a reasonable timeframe (5 – 10 years) (Mamen 2005). Much of our work herein attempts to assemble a comprehensive repertoire of sustainable food system indicators that adhere to the above-mentioned criteria.

2.1 <u>Re-Defining and Re-Designing the Model</u>

The model chosen from past group's work represents three rings of sustainability that overlap with each other. The lengths from the point of center to the circumference of the model represent the degree of sustainability for each indicator. As stated previously the model has two distinctly separate purposes and/or uses. One purpose is to "provide a visual framework to talk about a general vision, as well as, specific attributes of a sustainable food system" (Richer 2004 quoted in AGSC 450 Course Outline, 2006). The other purpose "provides a central means of documenting just how well *or* how poorly we are doing in making *strides* towards sustainability and in what *areas*" The first purpose we feel is qualitative, educational and should be designed so that it is easily recognizable as representing sustainability and the visions that specifically support the UBC Food Systems Project. One of the main purposes in carrying out the UBCFSP is to educate, encourage and motivate others to adopt sustainable practices into their actions on campus, their learning processes, and their lives in general. This model would be most utilized to facilitate education about sustainability; which the three interlinking Borromean Rings are already used for this purpose by Freda Pagani of the UBC Campus Sustainability Office. Perhaps for the UBCFSP minor changes could be made by making each ring be plant based versus metal.

The second model will have the indicators and benchmarks incorporated into it serving the purpose as a managerial tool. It is designed to be easily comprehended and interpreted while using complex data. It does not contradict the first model, but is used as a tool to support the vision of sustainability represented in the first model. The first model is a representation of an ideology and the second one is used to argue for this ideology. The model that we chose for benchmarking sustainability is the AMOEBA model as according to Giampietro & Pastore (2001) which has been proposed in the past by both Group 11, 2003 and Group 4, summer 2004. Specifically, the AMOEBA model is a radar diagram that is currently used for benchmarking development projects, cities, organizations and for various ecological projects (Munda 2005; Jones *et al.* 2005; Giampietro & Pastore 2001).

3.0 Findings

Indicators have been discussed according to how the rationale, criteria and findings are interconnected. To be more emotionally palatable we have addressed the issues/controversies and recommendations for each indicator within the body of the findings. The "discussion" and "recommendations" sections will only cover the broader issues at hand. Each benchmark that was able to be incorporated into the model (see Figure 1, 2 and 3) has a 'calculation' rationale which indicates the translation from indicator units to that of the models benchmark scale of 0 to 100% sustainability as set for the five year plan. The outer perimeter is the 5 year benchmark and the program used is Microsoft Excel, radar diagram. All data has been gathered through meetings with the respective partners unless otherwise referenced.

3.1 Benchmarking Overview – The Models
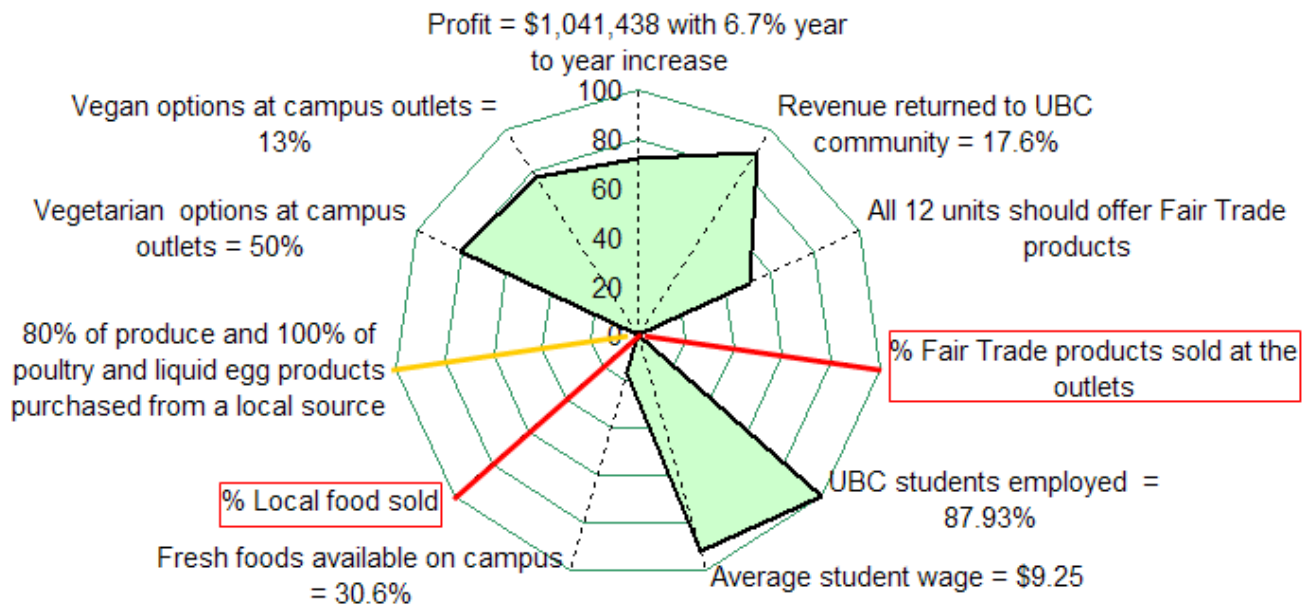
Figure 1. AMSFBD Model

Legend
——————— Indicator need to be reassessed
——————— Data complication in determining value, [   ] indeterminate benchmark
[▨▨▨] Current sustainability status
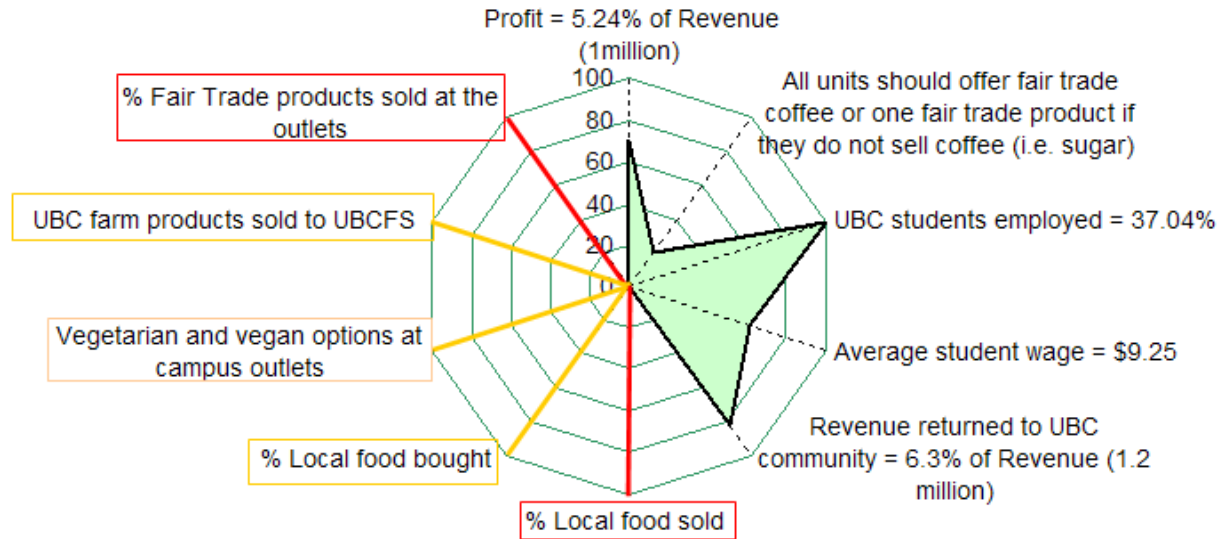
Figure 2. UBCFS Model
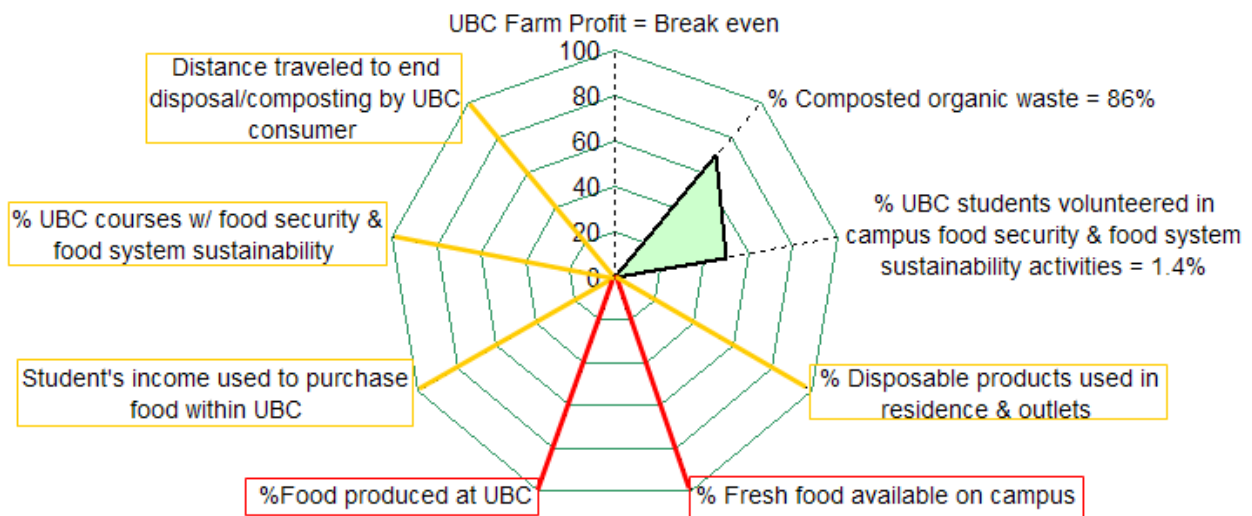
Figure 3. UBC Farm and Miscellaneous Model

4.0 – Discussion on Specific Findings: Success or Failure of Indicator Criteria, Data & Benchmark

4.1 % of Revenue that gets returned to the UBC Community	Socio-Economic

AMS: The percent of revenue returned to the UBC community is defined here as the profit divided by the

total revenue of AMSFBD because all profits are returned to the UBC community in the form of AMS clubs,

renovation to AMS buildings, welcome back BBQs, Safewalk, tutoring and other activities (Toogood). This

is possible because AMS is a non-profit organization. The expenses that are part of the everyday running

of AMS are not included as 'returned to the community' because we see this as necessary expenses that

are above managements 'choice' to return this to the community, such as wages going out to students.

Although 'students' are apart of the 'community', their wages are first and foremost a company expense.

There are probably expenses such as food purchased from UBC farm that would be considered returning

to UBC community that is non-profit, but is difficult to extract this information accurately.

Year	2000	2001	2002	2003	2004	2005
Profit / Revenue	13.2%	7.5%	5.6%	11.1%	13.7%	14.2%

(Financial Statements 2000; 2001; 2002; 2003; 2004; 2005)

100% of the profits are already returned to the UBC community so this cannot be improved. Lower profit

margins due to the introduction of organic and Fair Trade items will likely result in slower growth in profit

relative to revenue resulting in a lower percentage of revenue returned to UBC. This assumption is based

on the decrease in profit margins with the introduction of Fair Trade Coffee in order to keep it affordable for

the students (Toogood). Although, as a result of introducing fair trade coffee, sales have increased and

therefore overall profit has not decreased. For the benchmark we calculated the average rate of increase

from the past 6 years at 0.2% and based on current profit we estimated the profit five years from now.

- **Benchmark: 17.6 % at 0.2% rate of increase.**

Calculation: Range from $250k - $700k in the last 5 years. Using the most recent profit of $753,029 which is a 6.7% increase from the previous year's profit. We estimated profits 5 years out = current profit * (rate)^years = $753,029*(1.067)^5 = $1,041,438 in 2011. Range of 4.444M – 5.167M in the last 5 years. Using the most recent revenue, $5,286,306 which is 2.3% increase from the previous year. We estimate revenues 5 years out = current revenue * (rate)^years = $5,286,306 * (1.023)^5 = $5,922,846 in 2011..Using these 2 numbers to calculate the % of revenue returned to UBC. 2011 profits/ 2011 revenue = $1,041,438/$5,922,846 = **17.6%**

UBCFS: The annual amount of $1 million (5.3% of total revenue) is returned to the community which

consists of $400,000 in the forms of facility maintenance, utility, unit management costs, and General

Municipal Service tax. The rest is capital investment projects. This year, 2006, $1.9 million or 10% of the

revenue was spent and was exceptionally high because of renovations on Totem and Vanier cafeterias.

According to Andrew Parr a good range of capital investment is $1.2 million annually or 6.3% of revenue.

This reflects a good share of revenues that would be returned to the UBC community.

- **Benchmark: $1.2 million.**

Calculation: As 1 million = 5.25 %, want to be 6.3% so we are 83.17% away from target

| 4.2 Profitability of AMSFBD, UBCFS & UBC Farm | **Economic** |

AMS: To propose an accurate benchmark we wanted to look at past trends in the financial performance over the last 6 years and factors/assumptions that could affect future profitability. The profitability over the last 6 years is:

	Profitability	Year-to-Year comparison
2000	$586,967	
2001	$333,939	- 43% from 2000
2002	$254,898	- 10%
2003	$535,808	+110.2%
2004	$705,448	+31.7%
2005	**$753,029**	**+6.7%**

(Financial Statements 2000;2001;2002;2003;2004;2005)

A trend is not apparent from these results therefore we are using the most recent profit of $753,029 and the year to year increase of 6.7%. We looked for examples from other institutions to aid in determining a benchmark but did not find anything useful regarding this indicator. An assumption was made that profit margins would decrease on the introduction of more organic and Fair Trade items and therefore profits would not grow as fast. This assumption is based on the AMS introduction of Fair Trade Coffee and the decrease in profit margins on coffee to keep it affordable to students (Toogood).

- **Benchmark: 6.7% year to year increase in profitability = $1,041,438 (** 753,029 * (1.067)^5)

UBCFS: The net profits of UBCFS have increased over the last 5 years from $300,000 in 2001 to $700,000 in 2006. With revenue of $19.1 million in the fiscal year 2005/2006 net profits currently equal 3.7% of the revenue. According to the director, Andrew Parr, UBCFS has no plans of increasing this % in the future. The UBCFS Board and Andrew Parr are comfortable with this level, not wanting to go below 3.7% and they would feel a need to put profits back into the community (i.e. renovations) if profits were to exceed $1 million (5.24%). The board has no intention of making an excess profit from students.

- **Benchmark: Profit aimed at 5.24% of revenue = $1 million.**

UBC Farm: UBC Farm is not profitable. However, the farm is not profit driven. Their goal is to cover operational and labour costs (profits equal zero). If profits incur, then they will be used for education and/or student programs. **Revenue of the farm** may therefore be a stronger evaluator of the farm's economic viability and also has educational (and therefore social) implications. Management at the farm prefers the unit 'profitability per acre' which would coincide with the farms objective to put more acres into producible land (Dench et al. 2005). Revenue has increased from ~0 in 2000 to $48,000 in 2005. Current annual revenue is about $53,000. The benchmark is $240,000 by 2010. Revenue per acre is $17,000 in 2005 and its benchmark is $30,000 for 2010-12.

- **Benchmark: To break even.**

4.3 % of units that offer Fair Trade Products at AMSFBD & UBCFS	**Socio-Economic**

There are eight fair trade products offered in Canada: coffee, sugar, banana, cocoa, quinoa, mangoes, green and black teas, and rice (TransFair Canada).

AMS: The percent of units that offer Fair Trade Products is found to be 50%; this is 6 out of 12 units sell fair trade coffee. These units are AMS Catering, Bernoulis' Bagels, BlueChip Cookies, Gallery Lounge, Pendulum and Snack Attack. The non-revenue units such as the AMS administration office also use fair trade coffee. Many of the outlets do not have fair trade options for their product line mainly because they do not sell coffee. It would not be difficult to have them offer some raw Fair Trade goods that are available

- **Benchmark: All 12 units should offer Fair Trade Products.**

UBCFS: The following UBCFS outlets – 99 chairs, Edibles, Reboot, Arts, Vanier, and Totem – are the only units that sell Fair Trade coffee. Five years ago, there was no fair trade products offered in any of the units. Currently, 6 of the 30 units are offering Fair Trade Coffee, and this movement is expanding according to Andrew. Thus, only 20% of the total UBCFS units are offering fair trade products. It is difficult to establish a

benchmark, because some franchises like Subway are bounded by contracts, and thus, they are limited to the types of products that they can use. UBCFS should consolidate their relationships with the franchisee in respect to sustainable products use and encourage the franchises to stock fair trade products. An ideal benchmark is to increase the number of units that offer trade products in the years to come. The first step is to motivate all the coffee serving units to sell fair-trade coffee.

- **Benchmark: All 30 units should offer fair trade coffee or one fair trade product if they do not sell coffee (i.e. sugar).**

4.4 % Fair Trade Product sold by AMSFBD & UBCFS	**Socio-Economic**

This indicator is semi-redundant as the previous indicator also encourages the partners to move towards purchasing a greater amount of fair trade products. Also, the previous indicator's data is more readily attainable, and this indicator requires a calculation that would need to incorporate all products purchased by organization.

- **Suggest removing this indicator.**

4.5 % UBC students employed at AMSFBD & UBCFS	**Socio-Economic**

AMS: There are about 290 employees at AMSFBD, including 35 full time non-student employees (eg: managers, prep cooks) and about 255 students (Toogood). Thus, 87.93% are students and 12.07% are non-students. AMS student employment may have reached its status quo unless they are opening another unit or having special projects that require more student involvement. We cannot increase to 100% students' employment due to the skills, access and security, as well as full-time position required such as managers and cooks. With only a 10% student employment turnover (considered low) we propose the number of students employed stay the same.

- **Benchmark: student employment should be maintained at 87.93%.**

UBCFS: UBCFS currently employs 540 employees with 200 students (37.04%) and 340 unionized employees. We feel that this is a representative amount of students and the real sustainability issue is amount paid for wages, covered in the following indicator

- **Benchmark: Maintain 37.04% student employee.**

4.6 Average wage of UBC student employed at AMSFBD & UBCFS	**Socio-Economic**

AMS: The average wage of student employees is $9/hour. Average wage for a student who has worked for one year is $9.35, and goes up to $9.60 after two years. Students receive a free meal voucher that can be used during their shift, which works out to approximately $1/hr. Students are scheduled around their classes and exams with extreme shift flexibility (Toogood 2006). Wage should be paid fairly depending on the type of work. Currently students who have worked for 1 year receive $9.35. AMS raises student wages by 10 cents each year after working for 1 year. For setting a benchmark we thought it would be difficult to add 0.10 each year such that in five years the average wage would be 9.50, considering that a 0.10 raise in one year adds $16,666.7 to the annual expenses (Toogood). Therefore, we went with an average starting wage that is 0.10 below the returning employee at 9.25.

- **Benchmark: $9.25/hour student wage as a starting wage.**

UBCFS: Non-unionized students employed at UBCFS currently earn an average minimum wage of $8.00/hr and unionized students earn an average of $12.48/hr. The majority of the 200 students employed are non-unionized. The minimum wage versus unionized wage allows UBCFS to hire more students including international students who cannot work elsewhere. According to Parr, UBCFS may be coming to an agreement to pay non-unionized students $8.50/hr within the year. UBCFS is hindered in hiring more students and increasing their hours because of union regulations whereby a non-unionized student cannot displace a union employee thus they can only work 2.5 hours a day and cannot work shifts back to back. For the benchmarking rationale we feel UBCFS should be paying the same wage as AMS because both

students of both organizations are servicing the UBC community, so they should be paid equally regardless of the organizations that pay them. Though these two organizations may have different business ideals, both are servicing the UBC community, and should be communicating to set a standard wage for students. Ultimately a sustainable, equitable UBC food system will be paying students equally regardless of the organizations who pay them. By arguing for equal pay across organizations, we are addressing the social aspects of UBC food business to create that sustainability which is our goal. To argue further, factors that brought about an unsustainable system traditionally include more emphasis on economic efficiency.

- **Benchmark: $9.25/hour for non-union student average wage.**
Calculation: Both indicators had 6.00/hr as the zero point on the model as it is against labour laws to pay below this.

4.7 % of student's income used to afford nutritious, safe and appropriate foods sold within UBC
Socio-Economic

This indicator is ambiguous and wordy. "Income *used*" reflects a *choice* to spend versus "income *afforded*" reflects *limited funds* to spend. I suggest:**" % of student's income used to purchase nutritious, safe and appropriate food sold on UBC campus."** In terms of creating benchmarks, there was trouble understanding how this project can directly increase the percentage of income spent on safe, nutritious and appropriate foods. Meaningful calculations are especially difficult to acquire due to the fact that student income is incredibly variable. Perhaps a survey used throughout the next five years would be the best way to measure this indicator and maintain reproducibility and therefore validity in the measure. This survey would also help control for income spent on i) food bought or brought from off-campus and ii) food that is not considered nutritious, safe and appropriate. Canada's Food Guide to Healthy Eating can help define what foods are considered nutritious. Until these meaningful calculations can be made, benchmarking this indicator will remain ineffective at evaluating sustainability.

- **Benchmark: Indeterminate.**

4.8 % of organic waste that gets composted on campus	**Ecological**

Compostable materials include food waste, residual paper products, animal bedding, animal waste, wood, yard waste and sawdust. These materials make up 70% of UBC's total waste stream. The UBC community diverted a total of 2490 tonnes of waste material to recycling and composting last year yet this accounted for only 42% of the total 5929 tonnes of total waste (or 60% of compostable waste) in 2004/2005. **"What % of food service outlets have facilities to separate compostable waste"** may be another important indicator so as to address those facilities that do not. This additional benchmark would allow for more proactive change of food outlets that actually produce the bulk of compostable wastes.

- **Benchmark: To increase composted waste from the present 42% to 60% of total waste (or 86% of compostable waste).**

Calculation: Currently we compost 60% of organic waste. 86% is target. We are therefore at 69.77% of target.

4.9 % of disposable products consumers use at campus residencies and outlets	**Ecological**

This indicator is not clear and should be rewritten. A suggested version is **"% of waste from disposable products used at campus residencies and food outlets".** Disposable containers consist of 40% of the waste generated from campus food outlets. Identifying the food items that make use of disposable containers− and for what reason they are used− is needed in order to make realistic benchmarks for the future. A $0.15 discount is received at many food outlets when a reusable container or mug is brought by the customer.

- **Benchmark: Indeterminate due to lack of information.**

4.10 Distance that UBC consumer waste travels to end disposal/composting	**Ecological**

UBC waste management collects garbage daily. Various types of waste material are collected and transported to different locations depending on the day of the week. There is an in-vessel composting facility at UBC which decreases the *number* of trips to the Vancouver Transfer Station, Urban Wood Waste and Richmond BioRecovery by 54%. Most of the mature compost is used at UBC Farm and in landscape construction on campus. Distances that UBC consumer waste travels are listed in the following table:

Location	Material	Distance
UBC In-Vessel Composting system at South Campus	Compostable material	10.83 km
Vancouver Transfer Station	Collected garbage and non-recyclable wastes	14.6 km
Metro Materials Recovery Inc.	Cans, bottles, cardboard, paper, plastic product	14.05 km
Richmond Steel Recycling Ltd	Metal Scraps	17.47 km
Urban Wood Waste Recyclers Ltd	Clean wood and mattresses	10.83 km
Nu-life Industries Inc.	Fluorescent bulbs	69.66 km
Genesis Recycling Ltd.	e-waste	69.51 km

(Calculated by my Telus.com)

Next years project should consider the following: Is the calculation to be an *average* distance that

consumer waste goes or should there be numerous calculations with their respective types of waste and

volumes? Benchmarks considering simply reducing these distances are not realistic in the next 5 years.

- **Benchmark: Indeterminate. This indicator is not responsive to change within a reasonable timeframe.**

4.11 % of food used by AMSFBD & UBCFS that can be obtained locally (not in model)   Ecological

Local is defined here as products produced within British Columbia and semi-local are those within

Canada.

AMS: Approximately 54% of the *produce* AMS uses *could be* purchased from local sources as of 2004,

which equates to about 83% of food used by AMS that can be purchased within BC (Group 2, Summer

2004). This information is roughly estimated and no definite data can be made at this point. The purpose for

this indicator appears partially redundant when considering the next indicator "% of local foods purchased

by the organization" as this indicator (4.12) will better keep AMS/UBCFS on track in understanding their

personal progress in purchasing a represented amount of local foods. We question whether the

organizations will increase local purchasing by knowing just how many products are available locally, which

is what this indicator (4.11) is attempting to track. Due to these issues, we recommend that this indicator be

re-visited and assessed for both feasibility in obtaining the data readily and whether the indicator is needed.

- **Benchmark: Re-assess & Indeterminate.**

4.12 % of local foods purchased by AMSFBD & UBCFS	Ecological-Economic

AMS may only purchase up to roughly 20% of the locally available produce, thus cannot be accurately determined in the model. Non-produce local products include 100% shelled eggs plus all other poultry being semi-local (Group 6, 2005). Liquid egg products all come from Quebec (Group 6, 2005). As a benchmark, we believe that all poultry and liquid egg products can be obtained from BC sources because there are a large amount of chicken farms located in BC. Nancy Toogood believes that a feasible benchmark is 80% for the produce purchased locally (43% of 54% of the available produce in BC).

- **Benchmark: 80% of produce purchased from a local source (43% of the 54% available in BC).**

- **Benchmark: 100% of poultry and liquid egg products purchased from a local source.**

UBCFS Currently, the % of local food bought by UBCFS is uncertain, but products like dairy, poultry, eggs, and seasonal produce are mostly local. The benchmark is to gradually increase the variety of local products that meets the interests of the consumers while not violating the contracts with current distributors and suppliers. According to Andrew, the current % of local food bought by UBCFS is uncertain. It would be ideal, if UBCFS could purchase all of its produce from B.C. by 2011. Due to insufficient information, we were not able to measure the current status of this indicator. Thus, we were not able to set a benchmark.

- **Benchmark: Indeterminate.**

4.13 % of local foods sold by AMSFBD & UBCFS	Ecological-Economic

For **AMS** and **UBCFS –** This indicator is redundant because we have already dealt with the % of incoming local food purchased with the previous indicator. It is a duplicate process to track the outgoing product, when you already know the amount of local food incoming.

- **Benchmark: Unnecessary.**

4.14 % of farm products that are sold to AMSFBD & UBCFS	Ecological-Economic

Mark Bomford, the UBC Farm Co-ordinator, thinks this is not a valuable indicator. For one, these bodies are not able to pay premium prices for the produce. 95% of food produced at the farm goes to UBC

residents and this cannot improve much. Mark indicated that a much better indicator for the production side of the equation is the revenue of the farm (See "UBC Farm profitability" above). The reason why revenue is important for the farm sustainability is that with increased revenue, more money will be available to hire students to work at the farm, both in full time and part time positions. At the moment, the farm is hiring about 5 full time students, and Mark would like to get up to 10 full time and 10 part time students.

UBCFS - Sage Bistro is the only unit that currently purchases UBC Farm products. A total of $3500 was spent last year buying seasonal products, such as herbs, mixed greens, and root vegetables. To calculate this indicator the total revenue spent on produce would have to be known, but the information has not been accessed as of yet.

- **Benchmark: Indeterminate.**

4.15 % of foods produced at UBC	**Ecological-Economic**

This indicator is vague, not articulating what it truly is meant to measure that is particular to sustainability. Is this to be 'produced' from raw ingredients so as to say it is 'not processed' thus a reduction in fossil fuel use? Or is this to say it is grown at UBC and thus should be a UBC Farm indicator

- **Recommend rewriting the indicator or consider eliminating.**

4.16 % of UBC students who volunteer in activities related to food security and food system sustainability on campus	**Social**

In 2001 to 2005, there was an increase in student volunteers from 70 to 170 at the UBC Farm. Volunteer hours rose from 750 to 2500 at the farm during those same years. Agora consists of 55 volunteers at which 7 to 10 volunteers help out every Wednesday night dinner, Sprouts fills 22 volunteering positions and UBC Learning Exchange has 39 students involved in food related projects. There are 43,540 students at UBC and 296 volunteers involved in FS & FSS related projects. These volunteers represent 0.7% of the whole UBC student population.

Agora plans to decrease the number of volunteers, but increase the number of hours per volunteer. This raises a question: If this indicator shows a degree of how *many* individuals are taking personal action/responsibility/care in food related activities and issues, then the resultant numbers may be an overestimation of the number of people consciously supporting FS and FSS. This overestimation may be due to the following phenomena: "obligatory volunteerism" (ie from AGSC 100); overlap of volunteering (ie. one individual may volunteer at >1 position); and some volunteer positions may not support FS and FSS even if involved in these positions. This should be addressed by making a list of all volunteer names and positions, and subjectively deciding whether they support FS and/or FSS or not. Also, the length of time and/or frequency of volunteering required to be considered as a volunteer should also be better defined. In the next five years, the sum of volunteers is estimated to increase 10 to 20% each year which is calculated to be 0.7 to 1.4 increases in the % of *total* UBC students each year.

- **Benchmark: 1.4 % of *total* UBC students each year**.
Calculation: To increase from 0.7% to 1.4% means that we are currently at 50% from reaching the five year target.

4.17 % of Vegetarian and vegan options at campus food outlets	**Social**

AMS: Vegetarian and vegan are two separate food categories (a vegan cannot necessarily eat what a vegetarian can eat), therefore there should be two indicators here. Current vegan items offered are 10% of the total items in all outlets (30 out of 296). For vegetarian it is 40.5% of the total items (120 out of 296). By creating or increasing the amounts of vegan items it would create choice and allow vegans to eat at any of the AMS outlets. This would increase vegetarian options and encourage non-vegetarians to perhaps purchase more plant-based foods.

- **Benchmark: Each outlet to serve 2 or more vegan servings (13% of total items).**
Calculation: To reach 13% from 10% means that we are currently at 76.9% and 23.01% away from the target.

- **Benchmark: Increase to 50% of items which are vegetarian that would mean 148 of the 296 items.**
Calculation: To reach 50% from 40.5% means that we are currently at 81% and 19% away from target.

AMS Business	# menu items*	# vegan	# vegetarian	# fresh** foods	other
AMS Catering	23	7	16	8	Accommodate special dietary concerns
Bernoulli's Bagels	28	1	12	1	
AMS Outdoor BBQ					†
Blue Chip Cookies	28	1	28	1	
The Pit Burger Bar	37	0	9	0	
The Gallery Lounge	30	1	14	0	
The Honour Roll	39	9	10	0	
The Moon	8	2	4	0	
The Pendulum	37	2	5	3	
Pie R Squared	3	1***	2	0	***to order
The Pit Pub	46	0	10	0	
Snack Attack	17	6	10	1	
Total	296	30	120	14	
Percent		10%	40.5%	5%	

*menu items used were only those which were permanent, specials of the day were not included.

**fresh is being defined as produce (both fruits and vegetables)

† although no information couldn't be found regarding this outlet it is assumed that there are no vegan items here and mostly non-vegetarian foods. It is also assumed there would be no fresh foods at this outlet.

UBCFS: According to Andrew Parr, there are many vegetarian and vegan options available in each unit but they do not have a percent breakdown at this time.

- **Benchmark: Indeterminate.**

With this indicator, we must consider simple supply and demand concepts. Is there enough demand to warrant a larger supply of these foods? If not, then the indicator should not fall under *social* sustainability. Rather, these foods/diets would indicate *ecologically* sustainability of the food system and should therefore lie under that dimension.

4.18 % of fresh foods available	**Social**

"Fresh" is a challenging word to define. "Fresh" should support locality of production and should reduce "food miles" along the supply chain. "Fresh" should also support a lack of processing which indicates that individuals who demand fresh foods are more consciously involved with food (by choosing more healthy food items and willing to hand-prepare foods) and have more food skills. Perhaps, then, this indicator should be a social-ecological one. It has been suggested that creating an indicator that asks how much vended food is sold on campus may be a decent alternative. But this alternative may give a misunderstood

result of nutritious food being available and consumed because some vended foods are becoming relatively healthy. The concept of "food miles" as the main focus of an indicator may be the best substitute as it encompasses ideas such as freshness; locality of nutrient cycles; the use of fossil fuels in distribution; and the length and nature of the food supply chain. In this years project, the **% of fresh foods available** for AMS was determined while it has not been for UBCFS.

AMS: The percent of fresh foods available is 5%, defined as unprocessed fruits and vegetables, of the items at the AMS food outlets. This consisted mainly of salads, bananas and apples. Canada's food guide recommends 5-10 fruits/vegetable per day. This benchmark was calculated based upon 600 calories per day out of 2000 calories (7.5 out of 24 serving) (Health Canada; Trader's Joe).

- **Benchmark: Increase to at least 30.6 % of items being fresh foods.**
Calculation: 5% out of 30% is calculated to be 16.34%, so we are 13.66% away from target.

4.19 % of UBC courses offered about food security and food systems sustainability   Socio - Ecological

Is there an additional indicator (to this one) that would better represent a broader scope of the prevalence of FS and FSS education on campus (i.e. UBC Farm activities, demonstrations, info booths, flyers, articles in weekly and other media and periodicals)? 24% of UBC courses have to do with "sustainability" but not FS sustainability. This word can represent concepts that may be antitheses to the "LFS version" of sustainability. Benchmarks for this indicator are therefore indeterminate due to lack of this information. Also, it may be worthwhile to note the number of courses coming from each faculty at the university. Equally important would be to know whether those courses are *required* for particular programs or not as this would demonstrate the priorities of the faculties and shear number of student being introduced to FS and FSS concepts. A more specific indicator could be **% of courses that study or involve the farm in some way:** 4 courses and 200 students in 2001 to 37 courses and 1100 students 2005-06.

- **Benchmark: Indeterminate.**

5.0 Recommendations

Other Indicators that should be considered for the UBC Food System than discussed above.

- The number of research initiatives at the UBC Farm should be noted as an important indicator.

- Measure the amount of organic products/foods available at UBC as this also indicates ecological sustainability in addition to purchasing local foods.

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- The volume of garbage UBC produces, and if possible how much can be reduced from increased recycling/composting. If we are increasing the amount composted and recycled material, but not at a rate faster than the amount of garbage produced, we are becoming less sustainable even though our indicators on composting/recycling would be showing an increase in ecological sustainability.

Recommendation for working with the managerial model: This project incorporated the application of predetermined indicators into several models that represented the subsystem or several subsystems of the UBC food system. This action was taken because representing 31 indicators on one model was visually cumbersome. It may be rather more effective for each subsystem to be seen within its own progress distinctively. Ideally, it would have been the best to have separate subsystem models for UBC Farm and Waste Management, but this was beyond the scope of this project. It would also be useful to have a master model which highlights key/essential indicators which all partners/subsystems feel are the most representative of indicating where the *whole food system* is. We recommend that the partners determine what these essential indicators are so that these indicators are the first benchmarked by next year's class of Land, Food and Community. The partners would test the indicators adhering to the criteria listed above: perhaps finding new ones where data is available. It is recommended that future student groups should not determine this criterion or benchmark unless a proper module is taught beforehand. This should cover

research areas in food system and sustainability indicators, case studies on benchmarking for sustainable development, and application of indicators into benchmarking models.

It is recommended that the benchmarks are tracked annually and indicators re-visited bi-annually (re-evaluating criteria and creating new ones if data is now available). Finally the indicators that have well sourced data and benchmarks could be placed into real time on the sustainability website (like sheets of paper used are counted on the site today). This process will make the UBCFS to progress more distinctively so that other organizations and universities will be able to utilize this information for sustainable purposes.

6.0 Conclusion

It has been a very challenging experience to determine where the UBC Food System's current position is because some of the indicators still require further research and reassessment. For instance, it appears by looking at the model that AMSFBD is closer in reaching sustainable targets than the other sub-systems, but this is probably most attributable to the fact that a greater number of indicators were determined for AMS than any other. The greatest challenge of this project was the difficulty in trying to obtain the right data and searching for the missing information on several indicators. Further, once the data was received, it was difficult to perceive the ideal benchmarks unless a history of the organizations were apparent. In addition, they had to reflect the goals of the partners. Thus after attempting to create information bases for all the indicators, we conclude that before mapping and creating benchmarks, indicators must adhere to particular criteria as mentioned previously. The criteria we found most resourceful was derived from the Vivid Picture Project's process of creating indicators which is essentially that they are measurable, available, cost-effective, reliably sourced data, understandable, and be sensitive to change within 10 to 20 years (Mamen 2005).

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