

UBC Social Ecological Economic Development Studies (SEEDS) Student Report

Climate Action Partnership. Contribution of Food GHG Emissions Reductions: Moving

UBC Beyond Climate Neutral

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AGSC 450

April 10, 2009

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The University of British Columbia Food System Project

Scenario 1: *Climate Action Partnership. Contribution of Food GHG Emissions Reductions: Moving UBC Beyond Climate Neutral*

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Abstract

Avoiding serious global climate change will require deep cuts in greenhouse gas (GHG) emissions from all sources. As with many universities, UBC is associated with many types of GHG emission such as production and distribution of food on campus. Our task was to study emission reductions and climate action targets outlined by the UBC Climate Action Partnership. As a group, we have chosen to focus on education and awareness about the effects the food system and our food choices have on climate change. To achieve this goal our research methodology included interviews, research, review of previous years' papers, attending guest lectures given by AMS Food and Beverage Department and UBC Food Services, UBC farm, and Sprouts. It was hoped that through this research we could begin to develop educational tools that will help new UBC students understand what sustainability is, why it is important and what it means to UBC. This report provides details of our findings and the educational tools we developed in partnership with different groups around UBC. Our recommendations, which are based on our findings, can be used to further develop and refine existing research.

Introduction

Building a low-carbon economy is the central challenge of our age and one of the requirements in meeting this challenge is through policy innovations that are as unprecedented as the climate change it must address (Flavin, 2008). UBC recognizes climate change as one of the greatest challenges facing our planet and has made a number of steps towards addressing the climate change-related problems manifested at the campus. The Climate Action Partnership (CAP), which was created by the UBC Sustainability Office, is an example of a step, which has been taken to move UBC beyond climate neutral by having a group of campus

stakeholders being committed to decrease the greenhouse gas emissions of the UBC Campus. The purpose of this paper is to conduct a research on how the food system at UBC can decrease GHG emissions.

The focus of this paper is to raise awareness amongst first year students of the faculty of LFS by having an informative Barbeque at the farm. Issues such as UBC and sustainability, climate change and agriculture, and composting and recycling will be covered in the form of power point presentation. We hope the welcome barbeque will become an annual event and a great way to establish a sense of community within the LFS community.

The format of our paper starts off with a problem statement, which explains the importance of climate change and the relationship to the food system. This is followed by a critical review of the vision statement which reflects upon our group's ideas of extra information that can be incorporated into the vision statement. The methodology and findings section describes our central action of our project and what other university campuses are doing to make a carbon neutral change, we then move onto the targets and barriers section which emphasizes on goals and methods to decrease GHG emissions. The discussion section talks about the planning of the two events: the PowerPoint presentation for first year students and a barbeque at the farm. Since the two ideas of the events are still very new, recommendations are made for suggestions of improvements for these two events. Finally, we end the paper with a conclusion of explaining the importance of education and awareness of climate change.

Problem Statement

The increased attention on climate change has forced many to consider their role in the problem; personally, locally, provincially and globally. UBC is no exception; the large campus

emits approximately 145 600 tonnes of CO₂ through its operations annually (Rojas, A., & Richer, L., 2008). Green house gas emissions include: emissions from heat generation and electricity consumption, fleets, flights, commuter travel, production and distribution of food on campus, agriculture, fertilizer practices, construction and operation of on-campus buildings and neighborhoods (Rojas et al., 2008). A major contributor to the global climate change crisis is the food system. The key linkages between the food system and climate change are: direct emissions from agriculture due to its strong reliance on petroleum, machinery and transport, and the increased number of miles the average food item travels before reaching the consumer (Rojas et al., 2008).

Why is this important

The provincial government of British Columbia recently adopted a progressive carbon reduction plan in the passing of Bill 44: The GHG Reduction Target Act. This public sector target applies to universities, schools, and other public institutions. Its mission is to make British Columbia Carbon Neutral by 2010 (Penner, B., 2007). Carbon neutral refers to the production of no net GHG emissions (Adams, T., Allyn, H., Byland, M., Gosset, L., Holmes, E., St. Jules, D. 2008). To achieve carbon neutrality, institutions must undergo changes that will reduce their carbon emissions, while the remaining emissions can be balanced by purchasing carbon offsets. Carbon offsets are trade-able financial instruments representing a reduction in emissions from the efforts of another organization (Adams et al., 2008). The food system will play an important role in achieving the targets of Bill 44 set by the provincial government. Our food choices have significant impacts on these issues (Rojas et al., 2008). Some steps individuals can take to reduce their GHG emissions include: eating lower on the food chain, choosing local and/or organic produce, buying more sustainably raised animal products or converting to a vegan or vegetarian

lifestyle. Becoming aware of alternative waste disposal practices is imperative in reducing GHG emissions. Options include: recycling, composting, and purchasing products with less packaging (Rojas et al., 2008).

Impacts of food systems on climate change

The food system has huge impacts on climate change because it is multifaceted. This includes agriculture (growing/raising food), transportation, processing/packaging, and waste. It was estimated that food emissions from GHG count nearly as two times emissions resulting from driving in North America (Rojas et al., 2008). Previous AGSC 450 groups have reported that enteric fermentation by livestock and soil eruption are the largest contributors to GHG with methane and nitrous oxide being the main factors (Miles, C., Poon, I., Shepherd, M., St-Jules, D., Tong, E., Wang, Z., 2008). Methane remains in the atmosphere for 9 to 15 years and traps heat 21 times as effectively as CO₂. Fertilizers and manure release nitrous oxide, which is 296 times as good as CO₂ at trapping heat and remains in the atmosphere for 114 years on average (Trivedi, B. 2008). From transportation: the average food item in Canada travels 4497km and generates 51, 709 MCTE/year on its trip from farm to processing plant to supermarket to consumer (Miles et al., 2008). The other factor to consider is the mode of transportation; the majority is transported by air and truck; which together produce the most GHG emissions when compared to marine or rail (Miles et al., 2008). Transportation however accounts for only 11 per cent of food's total GHG emissions (Trivedi, B. 2008). The majority of greenhouse gases, 83 per cent, come from the actual production of the food (Trivedi, B. 2008). In terms of processing, the different methods include: canning, curing, pasteurizing, freezing, and dehydration which all utilize various amounts of energy. Canning uses twice the energy as freezing but because freezing requires continuous energy inputs it uses up to 35 percent more energy in the end (Miles

et al., 2008). For packaging: paper bags require 1.4 times more energy than a plastic bag of the same capacity. The energy required for the production of aluminum is extensive but recycling aluminum can save up to 84 million tonnes of GHG emissions per year (Miles et al., 2008). For waste: the largest contributor to GHG emissions is food waste. An estimated one third to one half of all food produced is not consumed therefore energy is wasted producing it and it takes up room in the landfills if not disposed of properly (Miles et al., 2008).

Impacts of Climate change on food systems

Living in temperate zones allows for food production for only approximately half of the year resulting in reliance on food grown in other countries. The changes in climate have made for extreme weather conditions that greatly affect food production. In some cases there is too much rain resulting in crop failures or conversely, there is not enough rain, which results in crop failing to thrive. Adaptations have to be made to current farming practices such as changing crop varieties, harvesting water, adopting water and soil conservation measures, and changing planting and harvesting periods (Yesuf, M., Falco, S., Deressa, T., Ringler, C., & Kohlin, G. 2008). Climate change makes it very difficult to guarantee food availability especially at the beginning and end of seasons (Frye, A. 2009). For example, in 2007, squash pizza was incorporated into the menu at Pie R squared (Frye, A. 2009). However, in 2008, due to the cold than usual winter which resulted in low squash production, this item could not be offered (Frye, A. 2009). This is further manifested at UBC Place Vanier dining halls where head chef, Steve Golob, mentions that the greatest challenge for importing food is dealing with seasonality, weather changes and food crossing the border (Golob, S. 2009). Due to the small scale of UBC farm, it only provides 8 percent of its produce to campus food outlets (Frye, A. 2009). Sourcing food this way increases the connection between the campus and the farm and contributes to a

sustainable, local food system with a lighter carbon footprint (Frye, A. 2009) but more is needed to further reduce GHG emissions.

UBC food system linked to global food system

UBC is a microcosm of the global food system; it has a large student body with as many as forty-five thousand students in the winter session. Due to the demand to feed tens of thousands people per day and the climate, it is difficult to produce enough local food to meet the demands and therefore UBC is reliant on foods that travel thousands of miles (Adams et al., 2008). Much of food served at UBC has been produced, processed, and packaged before arriving on campus and often undergoes further processing before being served (Adams et al., 2008). Climate change not only affects local growers, it also affects food production globally. Problems in the global food system have contributed to and been subjected to dramatic ecosystem damages including water and soil contamination and depletion and decreases in biodiversity (Rojas, A., Richer, L., Wagner, J., 2007).

Vision Statement and Identification of Value Assumptions

The vision statement evolved from a group of UBC AGSC students in 2004 who were asked to present their ideal image of what a sustainable food system at UBC would look like (Richer, L. 2004). Responses varied from very specific attributes to very broad visions of what a sustainable UBC would be. From that a summary of the attributes and visions were made and broken down into seven guiding principles that make up a single vision statement (Richer, L. 2004). The vision statement includes principles about food being grown, processed and disposed of locally to food bringing people and communities together to enjoy an ethnically diverse selection. It also encompasses the idea that the producers educate others about cultivation and processing.

Our group reflected on the seven guiding principles that make up the sustainability vision statement. As a group we feel that sustainability is a complex issue with many interrelated components that need to work together to make progress. We feel that locality is an important issue and one that should not be forgotten; however, it may not be the only option especially in terms of keeping the food selection ethnically diverse. It may be difficult to attain food that is both locally grown, produced, and processed and ethnically diverse. If we are to embrace locality we have to rediscover what our land has to offer. If ethnic diversity is imperative, non-local food may have to be purchased and in that case organic and fair trade food should be the next priority. Supporting fair trade and sustainable co-op imports is a way to connect with people across the globe. One point that could be added to the first vision statement about eating local food could even include eating food that is lower on the food chain more often.

Some feel that currently the most affordable foods are not safe or nutritious; that is they are heavily processed to have long shelf lives, are 'junk food', or are manufactured from mega-corporations for profit. However, others feel that society has been spoiled into thinking that food should be 'inexpensive.' Affordable food came about with the introduction of the green revolution, the era of pesticides and fertilizers. Therefore, for food to be 'safer' it also has to become more expensive.

Another point that came up was the concept of socially, ecologically conscious producers differs for everyone. So if one producer grows food that they believe is socially and ecologically produced, the definition may differ for another producer. For this reason the vision statement may need to include some step by step guidelines for all producers to follow to achieve this goal.

Methods and Findings

Our main methods included conducting research on our problem definition for a complete understanding of the tasks we were required to complete. This included online research, review of previous years' papers, attending guest lectures given by AMS Food and Beverage Department, UBC Food Services, UBC farm, and Sprouts, and personal communication with key informants.

Other University Initiatives to reduce GHG emissions

University of Waterloo's Climate Change Education and Awareness Campaign. Their goal is to educate students about climate change and inspire them to take action. Throughout the year they offer many workshops that touch on many different facets of Climate Change. Campaigns include: Weekly Public Lectures that feature experts from a number of different fields all discussing Climate Change, Brown Bag Lunch Seminars, Interfaculty Symposium on Climate Change; a forum where experts from vastly different disciplines could pool their knowledge together and make connections outside their fields.

University of Northern British Columbia's strategy is to maximize local and organic food on campus and improve vegetarian and vegan options at the cafeteria (UNBC, 2008). Another goal is to minimize food waste and throw-away service items by using creamers and milk jugs instead of individual plastic containers and have introduced a green tax on bottled water (UNBC, 2008). Also, there are plans to construct an on-campus greenhouse, expand on the composting and the outdoor student garden, and consider development of a non-student community garden (UNBC, 2008).

University of Victoria has made students' education and involvement a priority by making sustainability a part of new student orientation. Dining services offer meals that incorporate local

foods, as well as a few organic options (Report Card, 2009). The universities comprehensive recycling program has a 56 percent diversion rate (Report Card, 2009). In 2003, the university started composting all food wastes from operational activities on campus and now offers compost drop-off points for campus members (Report Card, 2009).

University of Toronto is partners with Local Flavour Plus, a nonprofit organization that certifies local farmers and links them with purchasers (Report Card, 2009). Dining services is currently putting a plan in place to offer as many sustainable and organic items as possible (Report Card, 2009). Food waste from the dining hall is composted. The St. George campus boasts a diversion rate of nearly 60 percent and intends to increase this rate to 70 percent by 2012 (Report Card, 2009).

University of Saskatchewan, food services purchases food from local businesses and suppliers, as well as a local dairy farm (Report Card, 2009). A discount is offered for bringing a reusable mug, and biodegradable plates and cutlery are offered. Metals, glass, plastic, and paper can be recycled on campus. Most of the landscaping waste produced during the summer is composted, and there are ongoing vermiculture composting projects (Report Card, 2009).

University of Calgary's food service provider purchases from 19 local farms and producers, spending approximately 10 percent of its budget on local foods and contracts with two local dairies. Fair trade coffee is available and discounts are offered for bringing reusable cups (Report Card, 2009). A pilot food composting program is also underway (Report Card, 2009)

Review of Previous UBC Food System Projects

The UBC Food Systems Project is an ongoing collaborative effort that encourages students to review past research and build upon it with new data and ideas. The research done in 2008 on Scenario 1 – Climate Action Partnership – Moving UBC Beyond Carbon Neutral was

integral in helping our group formulate the direction of our research. A brief summary of past findings is outlined below:

AGSC 450 Group 12 Research Summary 2008 – The food system is a major contributor to GHG emissions, particularly through the production of livestock and meat. Group 12 researched each aspect of the livestock industry and found that there are few ways decrease emissions other than decreasing or restricting consumer consumption. From this they recommended that future AGSC 450 students use their existing research to develop an information guide on sustainability for food service companies to refer to when making meat purchases.

AGSC 450 Group 21 Research Summary 2008 – Group 21 looked at the effects of agriculture, transportation, processing and packaging, and waste on GHG emissions in the food system. From here they developed a set of recommendations to help mitigate these effects including local food consumption, increasing energy efficiency in buildings and appliances, and increasing composting. Additional recommendations were also directed towards AGSC 450 students emphasizing the importance of education. It was suggested that a pamphlet be developed for new students detailing how to be sustainable and decrease emissions while on campus.

AGSC 450 Group 23 Research Summary 2008 – Food system sectors that can impact GHG emissions include supply, consumption, waste management and composting. Recommendations were presented based on food miles, food retail, waste, and awareness campaigns.

AGSC 450 Group 30 Research Summary 2008 – Key findings included the low supply of local food, the need for waste and energy reduction, and the need for policies to assist UBC food outlets to move beyond climate neutral. Recommendations included increasing post consumer composting.

AGSC 450 Group 1 Research Direction 2009 – From the research and recommendations compiled by AGSC 450 students in 2008 we were able to direct our research towards education and awareness. As consumers our food purchases and the way we dispose of our food waste can have a significant impact on the GHG emissions of the UBC campus. Since UBC offers many low carbon food choices and many ways to reduce our food waste, our study focused on raising awareness and educating first year students of these many climate change initiatives related to the food system that are happening throughout the UBC campus, and the ways that students can take an active role in reducing their GHG emissions.

UBC Climate Change Initiatives

The following outlines some important university and student driven sustainability initiatives taking place at UBC. We used this information to help develop our educational pieces, namely the LFS Welcome BBQ and Imagine Power Point presentation.

UBC Food Services – UBC Food Services is the primary food provider for UBC campus. With this responsibility there is the need to work with UBC to develop new sustainability initiatives that will help reach UBC CAP targets of becoming carbon neutral by 2010. Some of the steps UBCFS is taking towards becoming more sustainable includes: expanding recycling and organic waste program, providing biodegradable packaging, working with SEEDS and Ocean Wise on a seafood project, as well as providing local food options and selling only fair trade/organic/shade grown coffee.

Andrew Parr (Director – UBC Food Services) attended an AGSC 450 lecture as a guest speaker. During that time we posed the following question “what do you want students new to UBC to know and understand about UBC Food Services?” His response stated that UBCFS is

not a corporate giant, community service is their #1 priority and they would like student feedback with regards to what sustainable and ethical food options they should provide.

Steve Golob (Head Chef – Place Vanier) discussed how businesses like Café Perugia and Place Vanier are working to make more local produce purchases to incorporate into their menu; including some of the produce that the UBC Farm has to offer.

AMS Food and Beverage Department – *The* AMS Food and Beverage Department developed the AMS Lighter Footprint Strategy. In the wake of this event several initiatives have been developed to promote a lighter ecological campus footprint. LOV (local, organic, vegan) labels help make consumers aware of what they are purchasing. Eco Friendly Day takes place on the last Thursday of every month. During this time AMS food outlets provide a lighter footprint menu item. Collapsible, reusable Rubbermaid containers are available to purchase and think greener posters and recycling/composting signage is present throughout the SUB.

UBC Waste Management – In addition to managing campus waste, UBC Waste Management is working to educate the UBC campus community about recycling, composting, and waste reduction. Colour coordinated bins are located around campus to separate cans and bottles (black bin), paper products (blue bin), and compost (green bin) from litter.

SPROUTS – Sprouts is a student driven, sustainability initiative that works as a non-profit food cooperative. Their goal is to supply fresh, organic and local products, at an affordable price to the UBC campus community. Sprouts is run by the Natural Food Co-op, an organization that also heads Community Eats and the Bulk Buyers Club.

goBEYOND – goBEYOND is a student run climate action project supported by the UBC Sustainability Office, Common Energy, and the Sierra Youth Coalition. As an organization they work towards planning a low-carbon future.

Land and Food Systems Student Garden – The LFS Student Garden is a volunteer run, student driven initiative. It was developed as part of the AGSC 450 UBC Food Systems Project 2008 and continues to be a part of that with this year's fence building effort. The garden compliments the UBC Farm and AGORA by providing marketable produce. It plays an important role by helping connect LFS students to the food system.

Education and Awareness Relating to Climate Change

The United Nations Commission on Sustainable Development (UNCSD) outlines the importance of education in the attainment of a sustainable agriculture system; agriculture being one of the major contributors of GHG emissions related to our food system. They mention that not only will government and institutions play a key role in growing towards a sustainable food system; that the education of farmers and consumers will also be of primal importance (UNCSD, 2000). Together the role of government, farmer and consumer education will have to be hard-pressed in order to move forward towards a more sustainable food system (UNCSD, 2000). According to the UNCSD education and information policies will need to communicate the scale, the productive potential, and the multiple social and environmental contributions of sustainable agriculture (UNCSD, 2000). They also mention that a sustainable food system can only be achieved through a participatory approach. Sustainable agriculture is not a fixed set of practices or policies but a process of social learning and participatory research; which starts with identifying the assets already established within communities, and supplying targets and indicators to measure their progress. Consumers and others participants in the food system, such

as retailers and distributors should be educated and have proficient knowledge of the food system and the impacts of their food choices (UNCSD, 2000). They find that one of the problems that we are faced with in our societies is our increasing separation to our food source. They feel that educational programs are needed in order for the consumer to be able to make choices that are reinforced by knowledge of sustainable food systems. These educational programs should offer information on the hidden environmental and social costs of chemical agriculture, such as the GHG emissions needed to produce our seemingly abundant supply of food.

By educating the consumers, the consumer will in turn have the tools necessary to make more informed decisions, and in our consumer driven market economy, the consumer will dictate changes in available products (Linnemann, A., Benner, M., Verkerk, R., & van Boekel, M., 2006). The worldwide surge in organic food sales is a great example of this. Within the last decade consumers have been sending out a clear message to producers and retailers, that organic food is what they want. This has resulted in a 25 percent annual increase in organic sales since the year 2000 (World Resources Institute, 2004). This was only possible due to the increased awareness of consumers concerning the negative effects of conventional agriculture. Without this knowledge, consumers would not have had the tools necessary to utilize their market power to influence corporate environmental behaviour (World Resources Institute, 2004).

The way the information is conveyed to the students will also play an important role in the usefulness of the message. New methodological approaches such as participatory integrated assessment and sustainability science emphasize the importance of public participation in any attempt to build knowledge that will allow citizens to deal with the challenges, complexities, and uncertainties of the sustainability of our food system (Tabara, J. & Pahl-Wostl, 2007). This connects with the pedagogy of learning with the Head, Heart, and Hands approach. This

pedagogical approach balances cognitive (“head”), psychomotor (“hands”) and affective (“heart”) engagement with the goal of equipping people with the skills and attitudes that are central to the development of national and international environmental security (Sipos, Y., 2008). Environmental security being the cross between environmental and national security considerations at a national policy level, where the goal is to protect nature from human-induced threats, thereby protecting humans from the consequences of our actions, climate change being one of them (Sipos, Y., 2008). This example of Community-Based Research and Community Service-Learning is given by Sipos (Sipos, Y., 2008).

The education pedagogies and theories listed above are the foundation of our focus on education and awareness of the food system’s role on climate change. These pedagogies and education theories were used in the conception of our project outcome (Climate Change and Our Food System Presentation, and the Land and Food System Welcome BBQ).

UBC CAP Targets

Through increasing education and awareness of the food system and its relevance to climate change two of the UBC CAP targets will be touched upon. The first one being, to increase the amount of carbon neutral and local food purchased and served by all the UBC food outlets, and the second being, to ensure that by 2015, 90% of all the food waste stream produced on campus can be composted or recycled.

Increasing consumer awareness of the impacts of our food system on climate change will be a major contributor to the attainment of the first target; to increase the amount of carbon neutral and local food purchased and served by all the UBC food outlets to 75% of total food consumed on campus. By doing so, students will use their purchasing power to push the food system in the direction wanted (not sure of the wording in this section). Two indicators can be

used to monitor the progress of achieving the target. The first indicator is the annual amount of GHG emissions reduction. The second indicator is the annual percentage amount of foods served by all the UBC food outlets, which are obtained from local sources. UBC currently has successfully reduced 84,514 tonnes GHG emissions that occur within the campus since it was first monitored on April 1st, 1999 (UBC Sustainability Office, 2008). *UBC food services also contribute in reducing the GHG emissions by participating in Farm to college program in 2008. This event leads to the increase of the value of local foods obtained from UBC farm up to \$5000 (Richer, 2009). Furthermore, this number has been doubling up every year since 2006. The variety of farm produces also increases rapidly from year to year. However, some factors are known to be the limiting factor in achieving carbon neutral in UBC campus. Seasonal crop production and limited edible landscapes prevent the UBC campus from fully utilizing the local food all around the year. When access to local foods becomes limited, UBC campus is forced to import foods from other places in order to keep up with the high food demand in UBC food outlets.*

Secondly, through education and awareness students will become more aware of the impacts of food related waste, and will therefore choose products with less or no packaging or packaging that can be composted or recycled. By increasing consumer awareness, the consumers' choices will reflect the target; to ensure that 90% of UBC's food system waste stream can be recycled or composted. Using the consumer-driven food product development theory; if consumers no longer purchase food in containers that cannot be recycled, food outlets will have no choice but to change the packaging they offer (Linnemann et al., 2006). Also by increasing awareness of the effects of food related waste, consumers will be more aware of the way they dispose of their food waste; therefore increasing the amount of biodegradable

containers and food scraps actually being composted, and reducing the amount of contamination in the organic collection bins. The comparison of the annual amount of composted or recycle waste with the total annual amount of total waste is used as an indicator for this target. At UBC many approaches have been done in the effort of diverting as much as possible of UBC's total waste stream from the landfill. Some approaches include workshops, consultations, and newsletters. One of the larger approaches has been the investment in an in-vessel composting facility at UBC (UBC Waste Management, 2008). Since the introduction of the in-vessel composter, UBC has successfully increased the percentage of its total waste stream being diverted from the landfills, from 41% in 2005 to 46% in 2008. In March & December 2008, UBC diverted 75,000 non-biodegradable containers from going into the landfill through the use of compostable containers (Richer, 2009). This has contributed to the reduction of the amount of waste diverted from the usual waste stream by about 175 tonnes in 2008 (Richer 2009). The UBC in-vessel composter has digested approximately 300+ tonnes of waste since 2004. It gathers material from 46 sites including all food services, private housing developments, and institutional buildings (UBC Public Affair, 2007). However, the garbage cans still outnumber the composting containers on campus. The 70% of university's waste stream could be compostable by the UBC in-vessel composter (Adams, 2008). Food services at UBC provide organic waste collection in all food services units across campus (UBC Public Affair, 2007). Every year, UBC produces approximately 1900 tonnes of compostable waste, which includes residual paper products, food waste, animal waste, etc (UBC Waste Management, 2008). Although we use compostable containers, most of these products are made in Hong Kong, and need to be shipped to Canada by boat (Adams, 2008). Transportation by boat cause less GHG emissions compared to the other transportations such as plane & cars. However, the number of GHG emissions

caused by boats cannot be overlooked since UBC is not the only university purchasing these compostable containers. We theoretically know that these containers should be produced locally instead of importing them from Hong Kong. However, the required cost to build the manufacture is very high, which makes the food system even less sustainable. The other problem that was found is the high contamination of inorganic waste. An extensive sorting process is required to separate the organic & inorganic waste in order to minimize the amount of inorganic waste going to the in-vessel composter. This type of sorting increases the cost of labour of composting and organic waste collection.

Increasing Awareness of GHG Emissions and the Food System

With education and awareness of the food system and how it relates to GHG emission in mind, the idea of reaching new to UBC students came to our attention. Reaching students early on in their academic career is of importance in order for their efforts and participation to the reduction of GHG emissions to be ongoing. With this in mind the integration of a presentation during UBC Imagine, and a Welcome BBQ for first year LFS students was developed.

UBC Food System's Effect on Climate Change Presentation – Using information gathered from: previous AGSC 450 projects, UBC's sustainability initiatives, other universities' sustainability initiatives, and through online research we developed a presentation aimed at first year students (see appendix A). The presentation includes information on how the food system has an impact on the amount of GHG emissions, and how our choices as consumers can help to reduce our personal emissions. Issues with production, transportation, packaging, and waste of food were touched upon in the presentation. Initially the goal of the presentation was to reach as broad of an audience as possible; therefore we thought that showing the presentation during UBC Imagine would achieve this goal. However after talking with Chad Hyson, associate director of

student development, he informed us that they were actually looking to decrease the amount of information given to students during their first day on campus (see Appendix B) (Chad Hyson, Associate Director of Student Development, personal communication). During our meeting with Chad Hyson, he suggested that the information that we had gathered to form the presentation be utilized to write an article that would potentially appear in Connections, a magazine aimed at first year students. Chad also suggested that the information could be sent as an email in the new to UBC email, or as an information series in the UBC FYI (see Appendix B).

Associate dean Lynn Newman suggested that the presentation be presented in AGSC 100; therefore reaching all of the Land and Food System faculty (Lynn Newman, Associate Dean of the Faculty of Land and Food Systems, personal communications) (see Appendix B). During a meeting with Dean Isman, which will be teaching AGSC 100 next year, he did express interest in having the presentation given during AGSC 100 (Dean Murray Isman, Dean of the Faculty of Land and Food Systems, personal communications) (see Appendix B). Our meeting with Chad Hyson was delayed until the end of the project; therefore an alternate plan for the presentation has not been fully established, and planning for having the presentation given during AGSC 100 are still underway.

Land and Food System Welcome BBQ – After talking with Lynn Newman, she suggested that a dinner at the farm be organized during the first week of class to introduce new to LFS students to the UBC Farm (Lynn Newman, Associate Dean of the faculty of LFS, personal communication) (see Appendix B). The plan for the BBQ is to feature a local organic menu, networking and activities with professors in the faculty, workshops and booths showing the many initiatives that are happening throughout the UBC campus, a farm tour, as well as fun activities. In order for the BBQ to become a yearly event the help of AGUS, UBC Friends of the

Farm, UBC Farm Staff, LFS Faculty, and the Dean of LFS, will be needed. In order to convey our message and our vision, a proposal has been sent to the above mentioned key players (see Appendix C). UBC Farm Volunteer Coordinator, Ayla Harker, mentioned that UBC Jump Start did an excellent job at organizing larger events at the UBC Farm (Ayla Harker, Volunteer Coordinator at the UBC Farm, Personal communication). We then got in touch with UBC Jumps Start, and they provided us with a checklist to make the planning of the event smoother (see Appendix B). A budget that includes transportation, food, and portable toilets cost has been drafted (see Appendix C). We met with Dean Isman and he was very receptive of our idea, we plan to continue working with Dean Isman and the aforementioned organizations throughout the summer in order to make this event a reality.

Discussion

As a group we decided to focus our project on education and awareness about the effects the food system and our food choices have on climate change. The LFS Welcome BBQ is aimed at first year students in the faculty of LFS. The goal of the BBQ is to introduce first year LFS students to the UBC Farm by participating in a fun night of food, information, activities and networking with Profs, this will help them connect to the food system by learning through doing (Sipos, 2008). The BBQ will take place at the UBC Farm and will be centered on food; showing the connections between the food system and climate change, and showing them how their food choices can help reduce GHG emissions. We predict that through education consumers will have an effect on the consumer driven market economy (World Resources Institute, 2004 & Linnemann et al., 2006). Having the BBQ held at the farm will hopefully establish a connection with students and the food system; thereby bridging the gap between societies and overcoming one of the biggest barriers to a sustainable food system (UNCSD, 2000). By giving students a

better understanding of where their food comes from, and the impacts of the food choices that they make, students will become more informed and as a result make more conscious, informed decisions throughout their lives.

The presentation will play a key role in educating students about their role as consumers, and how their choices will have a great impact on GHG emissions. As a result of changing consumption patterns, retailers and food outlets will follow consumer demand (Linnemann et al., 2006). UBC food outlets have been making efforts in providing food that would have less of an impact on climate change; however economics plays a big role in the kind of changes that they are able to make. If consumer demand showed that students were willing to pay a price premium for more sustainable products, then UBC food outlets would have more incentive to reach for carbon neutrality (Linnemann et al., 2006).

Recommendations

UBC Sustainability Office – Short term: We feel that the UBC Sustainability Office (SO) has a lot of information, and staff members that could help increase the awareness of sustainability issues here on campus. We suggest that the SO have a booth at the Welcome BBQ in order to provide this vital information for the BBQ attendees. Another recommendation is to give Imagine MUG leaders a short (15min) orientation on sustainability issues. We feel this would increase the MUG leaders ability to vocalize these issues to the 1st year students they lead around during Imagine.

Long term: One recommendation they could work on in the future is to design a Sustainability Quiz to be administered to all UBC students via email. To encourage students to take the quiz sustainable prizes should be offered, either given to the students with the highest score or in a random draw.

UBC Food Services – Short term: We feel that the UBCFS is making many great strides to improve food sustainability at UBC. However, these initiatives are not well known across campus. We recommend that UBCFS have a representative at the Welcome BBQ to give a short presentation on what measures UBCFS has taken to become more sustainable. This will also give more students the chance to give their opinions and suggestions to UBCFS, who are very welcome to student feedback.

Long term: We recommend that UBCFS possibly take over menu and food preparation for the Welcome BBQ if this becomes an annual event.

AMS Food and Beverage Department – Short term: We also feel that AMSFBD is dedicated to making sustainable changes. AMSFBD should also have a representative at the Welcome BBQ to give short presentation on what measures they have taken to become more sustainable. We also recommend that during the first month on school they should have volunteers and/or staff stand at compost bins in the Student Union Building to help educate students on composting and help prevent contamination of the compost.

Long term: Similar to our recommendation for UBCFS, we think that AMSFBD could help with meal planning and food preparation for the Welcome BBQ if it becomes an annual event.

UBC Waste Management – Short term: We recommend that UBC Waste Management have a booth at the Welcome BBQ to talk to students and provide information about recycling/composting/waste at UBC.

Long term: For the future we feel it is vital for UBC Waste Management to prepare the establishment of UBCFS policies that specifically address waste practices at UBC, specifically those associated with the food system.

UBC Farm – Short term: We feel that the staff and volunteers at the UBC Farm can play an important role during the Welcome BBQ. We recommend that they provide tours and give presentation during the BBQ. This would be a great chance to highlight the importance of the UBC Farm and its importance in food security, as well as, a chance to recruit new student volunteers.

Campus and Community Planning – Short Term: In addition to ensuring the location and size of the existing UBC farm, we recommend that Campus and Community Planning (CCP) partner with UBC Waste Management to expand and develop more efficient composting and recycling program across campus.

Long Term: We recommend that CCP continue the construction of green buildings, and the retrofitting of existing buildings with greener alternatives.

AGSC 450 students next year – Short Term: For next year's AGSC 450 students we recommend that they use the information in our Food and Climate Change presentation to create an article for Connections and/or for FYI and New to UBC emails that 1st year students receive in the summer before school starts. They can do this by contacting Chad Hyson, of Imagine, who originally suggested this idea. We also recommend that the future AGSC 450 students present our Food and Climate Change presentation at student residences. After the presentation they can obtain feedback from the students by asking that they fill out a short survey asking if they learned anything new, anything useful, and if they will make any dietary changes as a result. In addition, we recommend that next year's AGSC 450 students follow up with Dean Isman in regards to incorporating our Food and Climate Change presentation into the AGSC 100 curriculum.

Long Term: In future year's we recommend that AGSC 450 students continue to build on the Welcome BBQ idea. In addition, AGSC 450 students should continue working with Chad Hyson to somehow incorporate a similar presentation on Food and Climate Change into Imagine in order to expose 1st year students of faculties outside LFS to these important food sustainability issues. To do this they could modify the existing presentation to make it applicable and interesting to students of other faculties.

Conclusion

UBC can provide both practical and moral leadership by taking steps to reduce its own emissions of greenhouse gases as well as by educating students about the implications of climate change. Our group feels that raising awareness amongst students with regards to issues such as climate change and global warming is beneficial to both students and the university. We hope that the UBC Food System's Effect on Climate Change presentation and the LFS Welcome BBQ at the farm will be a step towards achieving UBC's goal of moving beyond carbon neutral.

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