

UBC Social Ecological Economic Development Studies (SEEDS) Student Report

**CONDUCTING A SUSTAINABILITY ASSESSMENT OF UBC FOOD SERVICES &
INVESTIGATING SUSTAINABLE RICE PROCUREMENT**

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A Step Towards Food System Sustainability

CONDUCTING A SUSTAINABILITY ASSESSMENT OF UBC FOOD SERVICES & INVESTIGATING SUSTAINABLE RICE PROCUREMENT

University of British Columbia Food System Project - Scenario 6

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ABSTRACT

The UBC Food Systems Project is a community-based action research project that aims to improve the sustainability of the UBC Food System. Our group project focused on a scenario within the UBCFSP; the scenario's task was to research and conduct a sustainability assessment of UBC Food Services' procurement of staple food items, specifically rice. We have two goals for this project: the immediate goal of this project is to provide a preliminary investigation of UBCFS' procurement practices of rice and to explore other sustainable methods within the rice life cycle. The long-term goal is to prompt UBC to adopt more sustainable methods of rice procurement such as implementing a small rice field on the UBC Farm. Our team proposes to introduce environmentally more sustainable production methods in rice production and evaluate current rice procurement practices with the help of international rice production strategies. Our project identified the current procurement practices by UBCFS rice vendors and investigated other methods of rice production in Asia. Past AGSC 450 reports guided our research while sustainability initiatives by other university campuses assisted with the development of sustainable assessment indicators to evaluate carbon footprint. We also investigated the prospect of starting a small rice field at the UBC Farm as well as the current success of the Terra Nova rice field in Richmond, BC. It is our recommendation that research from future AGSC 450 classes will further the development and strengthen the collaboration between local farmers and markets to provide more sustainable practices of rice production and procurement by UBCFS.

INTRODUCTION

Our food system has become increasingly globalized over the past few decades and whereas food traditionally traveled minimal distance from “farm to table”, our diets today consist of foods from all over the world. This means a growing trend of increasing food miles, which has prompted the advocacy for stronger environmentally and socially sustainable practices within local and global food systems.

Since 1997, the University of British Columbia has been at the forefront in campus sustainability. In 2001, UBC launched The UBC Food Systems Project (UBCFSP), a community-based action research project as an endeavor to make the campus food system more sustainable, from food procurement to waste disposal. The UBCFSP is a multi-year, collaborate effort between students and teaching team in the Agricultural Science 450 Land, Food and Community (LFC) III course, and community partners and stakeholders. Each year, student groups are assigned to various scenarios that focus on different aspects under the umbrella goal of sustainability.

Our team’s scenario involves conducting a sustainability assessment of UBC Food Services food products, specifically a selection of UBCFS main staple products with extended shelf life. Our team decided to focus on rice procurement because rice is an important agricultural commodity. Our aim is to investigate the potential of improving the sustainability of UBCFS from improvements in rice production. This report will begin by providing an introduction of the role the food sector plays within the ‘food system crisis’, and the contributions of rice production and procurement to this crisis including intensive energy and water usage, water pollution, and greenhouse gas emissions. We will then introduce sustainability initiatives by other post-secondary institutions within and outside of Canada. Additionally, we will present the seven value assumptions that have guided our project and take this opportunity to emphasize our group and personal values.

The main body of this report will present our findings and discussion on the current approach to rice procurement in UBCFS and comment on the current obstacles in addition to potential opportunities to further the sustainability of UBCFS practices. We will then describe the environmental commitments for two rice manufacturers, Uncle Bens and Lunberg. Next, we will identify different strategies that various countries have undertaken as environmentally sustainable approaches to rice production.

Finally, we will conclude our report by providing recommendations to UBC Food Services, UBC Sustainability Office, UBC Farm, Campus and Community Planning, the Vancouver Food Policy Council, and to the future students and teaching team in the UBCFSP.

PROBLEM DEFINITION

Many universities worldwide have begun to adopt sustainability programs. For instance, it is becoming common practice to see schools establish ethical food sourcing policies, incorporate a small farm alongside the institute, and improve waste management practices. These initiatives are responses to rising food prices, limited resources, increasing fuel cost, climate change, and health problems, otherwise known as the ‘food system crisis’. Over the years, the UBC and UBCFS have made tremendous efforts in attaining sustainability. Many UBCFS food outlets now use fair trade coffee along with local and organic food on their menus. To take a closer step forward towards sustainability, UBCFS aims to tackle the main staple food ingredients in their operations. To that end, our group decided to investigate into the procurement of rice.

Rice is the staple food of almost 3 billion people in Asia and rice farms cover approximately 150 million hectares – more than any other crop, particularly in Asia (90% of world’s rice production) and Latin America (3.2%) (IRRI, 2004). Rice has also become a big component of the North American diet. In the United States, about one in five Americans consume at least half a serving of rice each day (Iowa

State University, 2005). On the UBC Point Grey campus alone, UBC Food services purchased about 6.5 tons of rice in 2008 (See Appendix B).

During the green revolution, intensification placed profound implications on the environment. The conventional technology for rice cultivation relies heavily on pesticides and fertilizers which reduce biodiversity within rice fields by affecting microbial life and disrupting of the natural food chain, increase nutrients and toxins in groundwater, and generate more greenhouse gases than any other major agricultural crop (WWF, 2005). Furthermore, prolonged use of fertilizers degrade soil quality, contribute to the eutrophication of paddy water and alkalinity of water, and increase the amount of fertilizer required to achieve the same level of productivity (WWF, 2005).

Water use and quality is another key concern. The heavy use of water through irrigation systems affects wetlands and water bodies, and causes the buildup of salinity and soil-related problems (IRRI, 2004). Climate change has recently emerged as a key global issue that requires immediate attention. Because rice cultivation takes place in wetlands and flooded paddies which are very water-intensive, rice fields generate large amounts of methane, a greenhouse gas that is 21 times more potent than CO₂ and is associated with climate change (US Environmental Protection Agency, 2006). In fact, rice paddies are one of the major agricultural contributors to global methane emissions (Neue, 1993). In Wetland rice fields, rice cannot hold the carbon in anaerobic conditions, forcing the microbes in the soil to convert the carbon into methane that is released into the atmosphere (Neue, 1993). It is estimated that current agricultural methane emissions contribute about 10-15% of total global methane emissions (Neue, 1993). Another estimate places the global contribution of methane emissions at 5-30% (WWF, 2005; Witte et al., 1993). Further rises in sea levels also stimulate the release of more methane into the atmosphere by rice plants (WWF, 2005). Additionally, rice fields contribute to carbon dioxide and nitric oxide emissions that implicate global warming. The burning of rice husks between harvests generates

carbon dioxide while the high use of nitrogen-based fertilizers increase nitric oxide emissions from rice fields (WWF, 2005; Khalil, 2006).

Such costs raise questions about the sustainability of current practices in rice production and procurement. As rice is a contributing factor to global warming, any reduction in greenhouse gas emissions and other components of ecological footprint would contribute to achieving sustainability. Furthermore, besides procuring goods that are produced locally, it is also part of the effort to reduce footprints by purchasing food products that are produced sustainably. It is therefore critical that the procurement of rice should not be taken for granted and that understanding its origins and environmental impacts are steps towards assessing the environmental sustainability on our local food system.

VISION STATEMENT

Before we launch into our research, we will elucidate the vision statements that guide the UBCFSP and our research project. As a group we believe that the seven vision statements are essential for the future well-being of our food system. We believe that the statements are attainable goals that should be adopted and achieved in our society today and will serve as a basis for the UBC Food Systems Projects. These statements reflect the LFS faculty staff and students, project partners, and community's passion for improving our local food system.

While the vision statements are stated in a precise manner, we feel that some statements should be elaborated. The statements could comment on the reduction in agrochemicals and encourage consumers to buy foods that are produced with environmental friendly practices. One of our group members feels that it is contradictory to encourage locally grown food while we also hope for ethnically diverse food. For example, rice being the staple food for many ethnic groups, is difficult to grow in Canada. We feel that it may be necessary to include in the first statement: Food is locally grown, produced and processed

if possible. If not, the food should be imported from the closest and environmental consciences food providers. We believe that the fourth statement is the most important because the enthusiasm to achieve the overarching goal of a sustainable food system appears to be localized behind closed doors within our faculty. However, the aim of achieving a sustainable food system is in fact a global issue and needs to be addressed by every individual. Unfortunately, the majority of people is oblivious to this fact or is unwilling to take action. Therefore, we must educate the general public on the importance of achieving sustainable food systems by promoting the seven statements. Consumers and producers need to be more conscious and know what they can do exactly to be part of a sustainable food system. The other aspects listed will eventually fall in place once consumers and producers are educated and are willing to take part in the movement.

METHODOLOGY

Our food systems project began with a review of the 2008 UBC Food Systems Project Summary Report, a selection of 2008 AGSC 450 FSP papers that are relevant to food procurement, as well as course readings that were provided to our scenario in the WebCT section. This approach was particularly useful to familiarize ourselves with the project in its entirety and understand how the scope of our project fits into the larger FSP vision. During this process, we also conducted a review of sustainability practices at other university campuses across North America. Based upon this review, we decided to research further into the University of Victoria, Simon Fraser University and the University of California of Santa Cruz, and conducted email interviews with representatives from these campuses about each institution's sustainability initiatives. At the same time, we investigated rice procurement at UBC. We corresponded with Lawry Poupart, the controller for Western Rice Mill, which is our major vendors, to find out the origin of the rice of which we purchase. Then, we used Google map and distance calculator provided by "date and time.com" to calculate the distance that the rice has to travel.

We also interviewed Tim Carter, UBC Farm production Coordinator to discuss the challenges and prospect of rice growing on the UBC Farm and in Vancouver. Finally, our research led us to interview Chef Ian Lai, executive director of the TNSP, about a small rice field that he is currently growing on the Terra Nova Farm in Richmond, BC.

Over the next few weeks, we brainstormed as a group on the topic of rice, rice procurement, and factors that may affect the sustainability of rice, such as transportation, cultivation methods, and waste. To that end, we conducted a literature search on rice and its impact on the environment, rice processing practices, rice cultivation processes and on countries that have adopted unique rice growing practices to achieve sustainability. We also looked at sustainable and environmentally friendly practices from rice companies that UBCFS is currently purchasing from.

At the same time, we conducted a face-to-face interview with Dorothy Yip, General Manager of Retail Operation, Purchasing and Project Coordination and Steve Golb, Head Chef of Place Vanier UBC, to gather input and information about UBC Food Services' current rice procurement practices. We discussed the challenges in rice procurement practices, UBCFS's interest in sustainability, and the potential for implementing sustainable practices in the future with regards to rice procurement. At the end of the interview, Dorothy provided us an inventory list of the vendors, brands and quantities of rice from the years 2006, 2007 and 2008.

FINDINGS

OTHER UNIVERSITY INITIATIVES

A. SIMON FRASER UNIVERSITY (SFU)

Sustainable SFU (SSFU) is a student, staff and alumni-run organization that is transforming SFU into a more sustainable university. In 2007, SSFU initiated a local food project to increase the amount of

fresh and local food, educate, and support food production and distribution projects on campus (SSFU, 2006). Among other established initiatives, this project has recently introduced the “Harvest Box” program which delivers fresh, affordable and quality produce to campus each month. Additionally, there is also a farmer’s market located beside the Surrey campus which allows for greater accessibility to local foods for students.

SFU also works together with Chartwells dining service to promote a sustainable food system (Sustainable Purchasing, 2009). Through Chartwells, SFU is able to achieve their goals by purchasing local food and ocean friendly produce from local vendors, and reducing food miles by purchasing within the province. Chartwells has also been central to helping SFU attain sustainability; Chartwells’ mandate states that they deal primarily with suppliers who use recyclable containers for delivery and compostable material for packaging (DOC, 2009).

B. UNIVERSITY OF VICTORIA (UVIC)

The University of Victoria (UVic) strives towards being a sustainable campus and community. There are over 200 courses at UVic that incorporate sustainability education in a number of disciplines. Moreover, UVic’s Student Society facilitates a number of green initiatives on campus. For example, the society offers free workshops for those that are interested in organic food gardening in their backyard (UVic Sustainability, n.d.).

The University of Victoria Sustainability Project (UVSP) is a student organization that was launched in 2005 in hopes to encourage sustainable living. They recently published the *UVSP’s Guide to Slow Living for Students*, which recommends students to slow down for healthier well-being and eating (UVSP, n.d.). The Food University Network is another new initiative that aims to be a leader in food sustainability in the region. They are partnered with *Share Organics* to offer a pocket market in which

organic, local and seasonal food is sold on campus. More recently, UVic established a list of actions for 2009-2014; one of these actions investigates a “low impact” menu that serves organic, local and seasonal dishes (Sarah Webb, Personal Communications, March 18 2009).

C. UNIVERSITY OF CALIFORNIA SANTA CRUZ (UCSC)

University of California Santa Cruz (UCSC) is one of the leading universities in conducting sustainable agriculture research and the Farm-to-College movement (CASFS). The Farm-to-College project connects the Center’s Farm located on campus with other local, organic farms along with other campus organizations bringing local organic products to the campus dining halls and restaurants.

On campus, there are a number of organizations, educational student programs and events that are focusing on food systems, such as program in community and agroecology (PICA), Kresge Food Cooperative and the ongoing Food systems working group (CASFS, 2007). These organizations and programs connect the campus farm with dining halls community and provide a chance for students and the community to learn about sustainable food systems. Kresge Food Cooperative is a key contributor in helping UCSC purchase local and organic produce. They sell local organic goods in bulk and emphasize on sustainability (CASFS, 2007). Moreover, the ongoing Food Systems Working Group continues to bring sustainable food to campus as well as educate the community throughout the years (CASFS, 2007).

UBC FOOD SERVICES AND CURRENT RICE PROCUREMENT PRACTICES

UBCFS currently procures rice of various brands from a number of vendors. In the past three years, UBCFS purchased seventeen rice products that fall under twelve brand names and which originate from various countries (Appendix B). The twelve brands include Uncle Bens; USA, Riso Arbori International; Italy, Lundberg; USA, Texana; various countries, Vita; Vietnam, Royal Van;

Thailand, Gldnchf; unknown, Xo Thai; Thailand, Mughal; unknown, Jackpot; USA, GFS; unknown and Nishiki; USA (Lawry Poupart, personal communication, April 1, 2009). Among the rice products we procure at UBC, Lunberg being produced in California is closest to Vancouver, which is about 1,750 km according to Google Map. On the other hand, rice products that originate furthest from Vancouver are grown in Thailand; the distance in between is approximately 11,820 km (Time and Date, 2009).

UBCFS selects its food provider based on quality and price. A manufacturer's commitment to the environment is only an asset; it does not solely influence the purchasing decision (Dorothy Yip, personal communication, March 4, 2009). Moreover, the methods that rice is produced and processed may have a greater impact on sustainability than the distance that rice travels to the consumer. We therefore investigated the rice processing practices of two producers that UBCFS deals with: Uncle Bens and Lunberg. These rice producers are the only two companies who explicitly state their sustainability approaches on their website.

UNCLE BENS

Uncle Bens[®] has a goal for environmental commitment – to waste nothing and to become energy self-sufficient. The company began initiatives such as using rice hulls to heat water and generating steam to cook rice (Uncle Ben's, 2008). The 200,000 pounds of rice hulls created everyday are therefore used as energy rather than being sent to landfill (Uncle Ben's, 2008). In addition, the ash resulted from burning the rice hulls will be sold at the steel industry to be used as insulator – achieving the goal of waste nothing (Uncle Ben's, 2008).

LUNBERG

Lunberg made a commitment to sustainability throughout the entire process of growing rice. Their goal is to maintain rich earth, clean air and pure water (Lunberg, n.d.). To ensure soil enrichment,

Lunberg combines the traditional method of crop rotation and fallowing fields (allowing the field to rest) with new techniques such as laser leveling rice fields (Lunberg, n.d.). To control weeds and pests, they use water management as the main tool and only use herbicides that are carefully chosen when needed. To reduce waste and gas emission, rice straws are not sent to landfill or burned (Lunberg, n.d.). Instead, they are chopped into small pieces and plowed back into the soil for decomposition. At the stage of storage, specialized heating system or atmospheric control is used rather than applying chemicals to get rid of grain insects (Lunberg, n.d.).

OTHER LOCAL INITIATIVES

A. UBC FARM

Purchasing rice from the UBC farm can be a big step towards sustainable food procurement. As an outcome of the UBCFSP, the UBC Farm has been supplying produce to various UBC food service establishments including Sprouts. One of our aspirations is to implement a small rice field on the UBC Farm to supply small amounts of rice to UBC Food Services, and to operate as an educational opportunity.

Many challenges to our project vision still exists, however; supply limitations pose as the central constraint for our goal towards sustainable rice procurement practice and to provide a closer source of rice on campus. Secondly, Tim Carter, the UBC Farm Production Coordinator explains that rice is one of the most challenging foods to grow due to climate factors, price incentives, difficulty in sourcing the appropriate sustainable indicators and the complexities in finding supportive evidences to trial. The weather and climate are the crucial impediments to influence the availability of certain foods in our region (Tim Carter, personal communication, March 16, 2009). Despite the fact that rice can be grown virtually anywhere, the warm Mediterranean climate is considered to be the ideal condition for rice

production. In BC, the temperature is cool and most varieties of rice are intolerable to grow or to sustain under this circumstance (Tim Carter, personal communication, March 16, 2009). Furthermore, the soil condition in BC is too sandy to hold water for cultivation due to precipitation and daylight constraints (Tim Carter, personal communication, March 16, 2009). Although flooding is not mandatory in rice growing practices, considerable efforts have to be made on other irrigation methods for pest and weed control.

Price incentives are other important driving factors for both producers and consumers to produce or to consume local foods. Since rice growing is labor intensive, the substantial labor costs are economically unviable for local farmers to maintain a rice field (Tim Carter, personal communication, March 16, 2009). Moreover, the potential demand for local rice production is minimal to motivate small, local farms to start a rice field. The price of local rice is assumed to be unreasonably high or unaffordable as to cover production costs.

The difficulty in obtaining adequate supportive evidence for rice growing in B.C. is the main obstacle to starting a rice field. As noted above, financial pressures (i.e. the need of a detailed economical analysis), environmental pressures (i.e. the difficulty to find appropriate indicators of sustainable practices and standards of food quality) and social pressures (i.e. the amount of research, time and effort required to implement) are issues that impede farmers to grow rice at the UBC farm or other farms in B.C.

B. TERRA NOVA SCHOOLYARD PROJECT

The Terra Nova Schoolyard Project (TNSP) is an initiative started by Chef Ian Lai, in the West Richmond Terra Nova district. The school yard project acts as a learning tool to connect elementary aged students back to the soil, by teaching students where their food comes from. Not only do the

students get to learn the practices of growing and harvesting fruits and vegetables but they also learn what it is to be in a community and share with others.

The latest project that the Terra Nova Gardens is embarking on is to grow rice in the northern part of the gardens. As Richmond is heavily occupied by Asian immigrant families that eat rice as a staple food, Chef Lai felt it would be appropriate to connect the students to foods that they consume on a daily basis (Ian Lai, Personal Communications, March 31 2009). He feels quite confident that this project will succeed, as Chef Lai has spent many years abroad in South East Asia. Ian feels the climate in Richmond is fairly similar to certain parts of China and Japan, and highly suitable for the *Oryza Sativa Indica* rice he will be cultivating (Ian Lai, Personal Communications, March 31 2009). He will be experimenting with the use of brackish water from the intertidal flooding next season to flood the rice paddy (Ian Lai, Personal Communications, March 31 2009). With the success of this project, Chef Lai hopes to achieve his admirable ten mile diet goal (Ian La, Personal Communications, March 31 2009).

INTERNATIONAL RICE PRODUCTION PRACTICES TOWARDS SUSTAINABILITY

A. INDIA

India is one of the leading countries that have endeavored to reform agriculture to meet the needs of climate change, sustained productivity and environmental conservation (Abrol, 2006). To achieve their goal, India has adopted Conservation Agriculture (CA), a resource-conserving concept whose primary focus is to raise crops without disrupting nature, enhance natural biological processes, and reduce the use of mechanical processes and external inputs (Abrol, 2006; FAO, 2008).

There are a number of advantages to CA. For instance, CA methods can be adopted in a wide range of rainfed and irrigated environments and has since been used in other countries including Brazil, North America, New Zealand, and Australia (Indian Agriculture, 2008). It also produces production yields that

are sustainable and at levels comparable to intensive farming. Other environmental benefits of CA include enhancing biodiversity, reducing CO₂ emissions, and improving water, soil and air quality (Abrol, 2006). Disadvantages to CA may include high initial costs for equipment, and high management and learning skills of the farmer when adapting to the new dynamics of conservation farming (Abrol, 2006).

B. USA - CALIFORNIA

California has the ideal climate and level of advanced technology that gives rise to the record average annual rice production in the world (California Rice, 2008). The government and industry's participation in sustainability programs and their use of exceptional production methods have facilitated sustainable rice production in California (California Rice, 2008).

The adverse effect of burning rice straw on air quality is often a key issue in sustainable rice production (California Rice, 2008). In California, a number of organizations are working together to lessen the impact on air quality by reducing open-field burning of rice straw. In 1991, California passed a law called The Rice Straw Burning Phase-down which restricts rice growers from burning more than 25 percent of their fields. Rice farmers may also participate in The Sacramento Valley Smoke Management Program and commit to burning only a small quantity of straw for the objective of disease-control (California Rice, 2008). The limitation on straw burning and disposal resulted in new management strategies such as recycling, expensive soil incorporation, and off-field uses (California Rice, 2008).

C. JAPAN

Rice is the most important agricultural commodity in Japan and has been grown in Japan for more than 2,500 years (Hogg, 2007). The Japanese government is keen on moving Japan towards a more sustainable and environmentally friendly country.

Tomioka Town founded the research group “Recycle in an Organic Spirit”, which local farmers, local consumers and farm produce processing companies all worked together to use composts to grow food. They compost food waste, tree barks and other biomasses in order to grow organic rice (Japan For Sustainability, 2006). They aim to generate enough compost to fertilize 35% of their current organic rice fields (Japan For Sustainability, 2006). Kikkoman Group supports this initiative by supplying biomass fertilizer from their very own recycling factories and by purchasing rice from Tomioka Town (Kikkoman, n.d.).

Another sustainability initiative in Japan called the Hyoutanbo rice growing program encourages farmers and elementary school children to interact with nature and promotes enjoyment of working in paddy fields. The farmers engage in chemical-free farming in order to improve water quality of the lake while children experience rice growing and learn about the ecosystem. (Japan For Sustainability, 2007).

SUSTAINABLE ASSESSMENT EVALUATION

UBC Food Services presently does not have formal guidelines on sustainable procurement (Dorothy Yip, personal communication, March 4, 2009). Although UBCFS continuously look for suppliers and producers that are more local, organic, and sustainable, the bottom line that finalizes the purchase comes down to food cost (Dorothy Yip, personal communication, March 4, 2009). However, guidelines should be developed in order to truly improve and satisfy sustainable procurement for the UBCFS. The UBC Sustainable Purchasing Guide produced by the Sustainability Office & Supply

Management is a great reference to start; it defines sustainable purchasing and is also supplemented with a supplier code of conduct (UBCSOSM, 2008).

In specific regard to the sustainable rice procurement, UBCFS should take these indicators into consideration: production, processing, packaging, transportation and food mileage. Similar to other initiatives that aim to introduce more ecologically sustainable products, the cost of escaping from conventional methods is often the step that often hinders organizations to do so. However, if UBCFS develops a document that details specific supplier codes of conduct, we believe it would pressure suppliers to take action and move towards more sustainable practices. Here is a check list to consider when purchasing:

Buy rice from suppliers that:

- Buy from producers that use sustainable methods of rice production
- Use energy efficient machinery in rice processing
- Make use of the concept “cradle to cradle” to reduce waste and renew resources (UBCSOSM, 2008)
- Use fuel efficient vehicles to transport materials and products
- Purchase rice from producers that travel a shorter distance to Canada

DISCUSSION

In an effort to achieve environmentally sustainable agriculture, global warming activists, organizations and farmers are jumping on the bandwagon to squelch rising greenhouse gases, improve biodiversity, and to arrest further environmental degradation, pollution and water waste. In 2004, the International Rice Research Institute (IRRI) developed the IRRI’s Environmental Agenda with the strategic goal to ensure that rice production is sustainable, has minimal negative environmental impact, and can cope with climate change. To meet their vision, they developed targets to be achieved by 2015 with the specific focus on land management, biodiversity, water availability and climate change (IRRI, 2004).

Many countries have also implemented innovative strategies to help reach these goals. For example, India, California and Japan have each adopted unique strategies to improve environmental sustainability. While India focuses on Conservation Agriculture technology to enhance natural processes, while California and Japan target the burning of leftover rice husks and convert the scraps into other forms of power (Associated Press, 2007). This energy, which can be used for anything including computer chips, is then sold back the state or to European countries. Changes in farming practices in China have also led to a decrease in methane emissions.

Other sustainability practices suggest that rice can be cultivated without paddies and may be grown in drier conditions without compromising yield (WWF, 2005). Additionally, Chinese studies reveal that methane can be significantly reduced while also boosting crop yield by draining the paddies midway through the season to interrupt methane production (NASA, 2002). These studies suggest that rice does not have to be limited to warmer climates.

APPLICATIONS OF OTHER UNIVERSITY INITIATIVES TO UBC AND UBCFS

While many universities discussed have similarities to UBCFS, their sustainability initiatives can also provide a reference for UBCFS. For example, UBCFS and Chartwells Food Service at SFU both share similar guidelines on waste management and composting. They also both use recyclable plastic and paper containers for food preparation. Additionally, all of the universities SFU, UVic and UCSC promote local, organic foods and sell produce on campus. UBC currently does not sell much organic locally grown produce on campus; SFU's "Harvest Box" can therefore apply to UBC making it more accessible for local food products. Additionally, UBC has its own organic farm on campus similar to the one in UCSC. Both programs provide opportunities for students to work on the farm and to support the local food system.

UBCFS FOOD PROCUREMENT GUIDELINES

At the moment, UBC does not have any specific guidelines regarding the procurement of food. However, they aim to improve the sustainability of food procurement in the near future, which includes increasing the purchase of local food ingredients, increasing the purchase of produce from UBC farm and strengthening the bond with current local producers. As with other food providers, UBCFS finds it a challenge to meet these goals. Not all food service providers on campus put sustainability as their top priority as price and quality are often the main concerns as a result of fluctuating prices and the quality of foods that they obtain from different suppliers. As a result, it makes it difficult for the UBC campus as a whole to reach a comfort level of sustainability. Further compounding the problem, sustainability is an additional consideration that food service companies have to take into account. It is often ignored in favour of higher profits that come from food pricing and quality.

UBC FARM & TERRA NOVA GARDENS

Our preliminary assessment of local rice procurement practices show that growing rice at the UBC farm is currently not a feasible option to accommodate UBCFS. The procurement demands to produce rice is inadequate for the farm to launch a pilot project to actually grow rice. Not only is it economically unsustainable for the UBC farm, but there also lacks history of rice growing in the UBC Farm's sandy soil.

The Terra Nova Schoolyard Project (TNSP) located in Richmond, BC recently started a small rice field in the agricultural land reserve (ALR) in the Terra Nova Gardens. The rice paddy has already been ploughed and tilled and is ready for the growing season. Chef Ian Lai, the founder of the TNSP, believes that the project will be a success because he feels climate and altitude of the Richmond ALR area is suitable and compares favorably to the likes of Japan.

RECOMMENDATIONS

RECOMMENDATIONS FOR UBC FOOD SERVICES

- Request product information from food suppliers including food origin, food mileage, nutritional facts, processing and packaging practices and waste disposal methods. This is to raise the transparency of food products provided in the campus from cultivation to consumption to waste management
- Continue to encourage food suppliers to adopt more sustainable operations

RECOMMENDATIONS FOR UBC SUSTAINABILITY OFFICE

- Develop guidelines and supportive evidence to encourage food suppliers to adopt more sustainable practices
- Develop indicators or score system to evaluate sustainability
- Continue to evoke campus awareness in the importance of sustainability

RECOMMENDATIONS FOR UBC FARM

- Introduce a small rice field as a pilot project and educational opportunity for students and community

RECOMMENDATIONS FOR CAMPUS AND COMMUNITY PLANNING

- Designs or plans more available farmlands to support greater or more diverse local food production on campus
- Assist local farmers in implementing more sustainable practices
- Designs more routes to assist the transportations and to increase the accessibility of locally grown foods
- Establish an action plan and a timeframe on how and when each of these minor goals can be accomplished
- Establish a list of different constraints or barriers found during the implementation of the action plan and timeframe

RECOMMENDATIONS FOR THE VANCOUVER FOOD POLICY COUNCIL

- Generate a wider network with local farmers, processors, distributors or suppliers and

consumers on the UBC campus to raise the transparency of wills from different parties, to enhance relationship bonding, to facilitate communications and research and to assist the promotion and education of sustainability and local food products

RECOMMENDATIONS FOR FUTURE STUDENTS IN THE UBCFSP

- Establish revision plans to investigate or evaluate the progress of the action plan made in the previous year, to conduct further research on possible solutions to overcome, to make modifications, to find new occurring constraints, to generate new approaches to problems and to set new goals
- Strengthen the linkages with other non-profit organizations to promote the significance of sustainability on campus
- Develop further research to encourage local farmers to grow. For example, the occurrence of price incentives, the market of certain locally grown foods and etc.

RECOMMENDATIONS FOR AGSC 450 TEACHING TEAM

- Continue to provide support to students engaged in the UBCFSP

CONCLUSION

The UBC Food Systems Project is one of many research endeavors for the development of sustainability for the University of British Columbia. Sustainability initiatives from the University of Victoria, Simon Fraser University and the University of California of Santa Cruz provided us with additional criteria that we considered in our evaluation of what was a sustainable rice practice suitable for UBC Food Services. It is important to involve the campus in order to initiate and develop a greener community. Food miles, waste, packaging, and methods of rice production are all essential in determining the sustainability of each practice.

Although the procurement of rice is such a complex topic, we chose to look at rice procurement because rice is a highly consumed food item in UBCFSP and it has a significant contribution to climate

change. Our team felt that it was important to try and investigate where rice comes from and how this influences our local food system. After examining a wide range of rice production practices, we were able to determine some of the important factors that contribute to rice production sustainability. We had hoped to provide specific and relevant recommendations to UBCFS on how rice procurement could be immediately improved. Although we were unable to achieve these outcomes, we were able to provide a stepping stone for subsequent AGSC 450 Scenario 6 groups to build on. We highly recommend the next group to focus on the current UBCFS rice vendors and also to follow closely on the Terra Nova School Yard Project. With further research from next year's AGSC 450 colleagues on other rice distributors and developing local rice production practices such as the Terra Nova Gardens and the UBC Farm, we hope that UBC Food Services will be able to integrate all of these factors to determine the most sustainable method for where to purchase the rice from.

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APPENDIX A

EMAIL CORRESPONDENCE WITH CHEF IAN LAI (EXECUTIVE DIRECTOR OF TERRA NOVA SCHOOLYARD SOCIETY)

[REDACTED]

[REDACTED]

[REDACTED]

1. What kind of rice are you planning to or are growing? *Oryza sativa indica*
2. How confident are you in the success of this project? Do you think the climate will be suitable?
I am quite confident that this project will be successful. Nothing objective or scientific. I am extrapolating from past observational experience in my travels to S.E. Asia. The rainy weather will help to flood the paddy and the length of sunshine is pretty much 6 months.
3. Have you looked into more sustainable ways to grow the rice or will you be growing the rice with traditional methods?
This experiment will be using traditional methods but with less water. I am hoping to use brackish water from the inter-tidal flooding next season to see if it works. I will be growing some rice in brackish water to

measure effect. Probably not as scientific as a university would like but a comparison none the less.

4. Do you know anyone else in the lower mainland that is attempting to grow rice? No.

5. What difference are you hoping to see if this project is a success? (eg. local rice vs. imported rice, better taste, less waste..)

Prove that Richmond can be used to cultivate rice without using fresh water. Very long term goal. I really just need to fill a gap in my 10 mile diet for rice!

6. Do you have any literary references that you could direct us to? No. Just what is on the internet.

EMAIL CORRESPONDENCE WITH SARAH WEBB (SUSTAINABILITY COORDINATOR OF UNIVERSITY OF VICTORIA)

Hi Lucy,

Here are a few of the goals we established for UVic as it relates to sustainable food procurement. There are a whole series of actions that relate to this topic, so I have just put a few down for you.

Goals:

- Utilize a triple bottom line framework for major purchasing decisions by 2010.
- By 2012, establish a regional or provincial sustainability purchasing initiative to incubate ideas and support for sustainability purchasing policies and practice.
- Serve fair trade certified products that are readily available (Coffee, Tea, Chocolate, Sugar etc.) in 100% of food outlets on campus.
- Design purchasing agreements that accommodate different sizes and types of businesses.
- Increase purchasing of local goods and services.
- Increase accessibility to healthy and diverse food options.
- Review and assess the opportunities for locally produced and other “low impact” food options to be made available on campus.
- Increase spending on organic and fair trade food and beverages

Actions: 2009 - 2014

- Review supplier codes of conduct on a regular basis to ensure the most up to date practices and legislation are included.
- Provide information on ethical and sustainable products used on the UVic campus and showcase the suppliers/manufacturers that provide them.
- Assess availability of Fair Trade food and beverage products on campus.
- Evaluate and monitor the market-wide impacts of sustainability purchasing on an ongoing basis.
- Increase communications on the benefits of strategic alliances and the process of creating them.
- Increase nutritional and sustainable food and beverage options on campus.
- Investigate a “low impact” menu/café on campus that serves organic, local or seasonal dishes.
- Create public food spaces (kitchens, microwaves, public water, etc...)
- Provide nutritional information on foods served in cafeterias and campus food outlets.
- Expand access to nutritional foods outside of regular university working hours.
- Create a demonstration garden at the family student housing area.
- Work with local farmers and producers to enhance production and supply of produce in the local community through Purchasing programs and initiatives.

- Establish mechanisms that allow UVic to purchase local goods and services while ensuring compliance with trade agreements such as TILMA.
- Continue to provide support to the Campus Community Gardens

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Here is the type/brand of rice used in the Student Union Building. Another report to follow.

Jackpot extra long grain brown
Uncle tom's extra long grain white
Quilla basmati

Regards,
Sarah

Hi Lucy,

We do not have an ecological footprint or sustainability analysis of rice on campus.

I have requested a series of types/brands that we use from our Housing Food and Conference Services Department to send to you. I will send them along shortly. I am very interested in the results of your study - can you send along a completed report
Best regards

Sarah

Sarah Webb
Sustainability Coordinator
Office of Campus Planning & Sustainability
University of Victoria

[REDACTED]
[REDACTED]

www.uvic.ca/sustainability

EMAIL CORRESPONDENCE WITH LAWRY POUPART (WESTERN RICE MILLS CONTROLLER)

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Hi Sophie

See below, I have combined your both questions and answers in to this one e-mail

Lawry

1. Riso Arbori Itl **Italy**
2. Lundberg **USA California**
3. Texana **Note this is our own brand name. We use rice from several countries depending on what kind of rice we are putting in the Texana bags.**
4. Vita **Vietnam**
5. Royal Van **Not sure what brand you are referring to. If it is Royal Umbrella, then this is from Thailand Yes, we sell Royal Umbrella (red) a high quality rice and Royal Umbrella (blue) a less superior quality. Both come from Thailand**
6. Xo Thai **Thailand**
7. Jackpot **USA Arkansas**
8. Nishiki **USA California**
9. Wild Rice **Canada (Note, in fact, wild rice is not a true rice, but a type of grass seed) Believe it or NOT !**

Our questions:

1. What country was the rice produced in for each brand mentioned above?

As indicated above. If you need more info, please specify.

2. Does Western Rice Mills Ltd have any environmental commitment?

Not sure what you are referring to. Our Company only imports and distributes rice. We have little environmental issues. We do recycle everything, including all packing, and office paper supplies as well as all old computers, etc.

It would be great if you can assist us on this and we hope to hear from you shortly!

We welcome your interest in Western Rice Mills. Please let me know if I can assist in any other matters.

Regards,

Lawry Poupart

Controller

Western Rice Mills

EMAIL CORRESPONDENCE WITH TIM CARTER (UBC FARM PRODUCTION COORDINATOR)

Part B: Is UBC farm growing rice? (if the answer is no, please proceed and answer the questions in part b)

- 1) Why not? Trying to grow rice at the UBC Farm has simply not been a priority. Grains in general usually don't make economic sense for us to grow, and if we were to grow grains it would make more sense to grow something that there is a long history of growing in this climate. Because there isn't much of a history of growing rice in this area (that I know of anyway), we wouldn't know how to do if even if we wanted to give it a try.
- 2) Why is it not possible? I wouldn't want to say that it's not possible, but it would certainly be a challenge. Most varieties of rice would not grow well in this cold of a climate. Also, rice is usually grown in fields that can be flooded for part of the year; the soils at UBC Farm are sandy and would not hold water very well.
- 3) What can be done to make it possible? You would need to locate some cold tolerant, aerobic rice varieties to trial here (from China, probably). You would also need to provide some economic analysis that indicates why rice production might be a good idea for the UBC Farm or other farms in BC.
- 4) Is it cost effective, safe or sustainable to make it possible? I have no idea.

5) Can the demand/ possible profit maximization drive the intention to grow? It seems like most North American consumers are happy with California, Arkansas, or Asian grown rice, but I'm sure that there would be a small market for really local rice.

Regards,
Wai Kee Yip

APPENDIX B

UBC FOOD SERVICES
RICE VELOCITY REPORT

2006 - 2007 - 2008

| ITEM # | ITEM DESCRIPTION | UM SOLD | PRICE BY UM | PACK | SIZE | BRAND NAME | VENDOR NAME | MFG NO. | SYSCO | | NEPTUNE | | Weight of rice purchased in 2008 (KG) |
|---------|---------------------------|---------|-------------|------|------|-----------------|-------------------------|----------|--------------|----------------------|--------------|--------------|---------------------------------------|
| | | | | | | | | | YTD QTY 2006 | VENDOR/BRAND (SYSCO) | YTD QTY 2007 | YTD QTY 2008 | |
| 3261737 | RICE 7 GRN BLEND | CS | CS | 2 | 4KG | UNCLE BENS | MARS CANADA INC. | 1418 | 14 | UNCLE BENS | 14 | 11 | 88 |
| 3247907 | RICE ARBORIO | CS | CS | 12 | 1KG | RISO ARBORI ITL | WESTERN RICE MILLS LTD. | 4502121 | 2 | WESTERN RICE | | 5 | 60 |
| 3263887 | RICE BASMATI | CS | CS | 1 | 4KG | MUGHAL | GOLDEN BOY FOODS INC. | 10154 | | | 53 | 103 | 412 |
| 3264487 | RICE BASMATI BRN | CS | CS | 1 | 25LB | LUNDBERG | WESTERN RICE MILLS LTD. | 12204025 | | | | 1 | 11.363636 |
| 1021364 | RICE BASMATI INDIAN | CS | CS | 1 | 10KG | TEXANA | WESTERN RICE MILLS LTD. | 11372010 | 140 | INDIAS | 51 | 36 | 360 |
| 3261687 | RICE BRN UNCLE BENS | CS | CS | 1 | 20LB | UNCLE BENS | MARS CANADA INC. | 12109 | 50 | UNCLE BENS | 83 | 124 | 1127.2727 |
| 1054880 | RICE JASMINE | CS | CS | 1 | 40LB | VITA | WESTERN RICE MILLS LTD. | 2714040 | | | | 11 | 200 |
| 3510417 | RICE JASMINE BLUE LABEL | CS | CS | 1 | 18LB | ROYAL VAN | WESTERN RICE MILLS LTD. | 2142008 | | | 43 | 124 | 1014.5455 |
| 2907392 | RICE JASMINE SCENTED | CS | CS | 1 | 20KG | GLDNCHF | GOLDEN BOY FOODS INC. | | 48 | GOLDEN BOY | 28 | 3 | |
| 1019162 | THAI CRYSTAL JASMINE RICE | CS | CS | 1 | 8KG | XO THAI | WESTERN RICE MILLS LTD. | 2032008 | | | | | |
| 3265537 | RICE LONG GRAIN BRN | CS | CS | 1 | 20LB | JACKPOT | WESTERN | 3304020 | 1 | WESTERN RICE | 4 | 1 | 9.0909091 |

| | | | | | | | | | | | RICE MILLS LTD. | | |
|---------|--------------------------------------|----|----|---|------|------------|-------------------------|----------|-----|--------------|-----------------|-----|---------------|
| 3267307 | RICE LONG GRAIN PARBOILED | CS | CS | 1 | 20KG | GFS | | 46657 | 100 | RICELAND | 85 | 125 | 2500 |
| 3267327 | RICE LONG GRN XTRA FANCY | CS | CS | 1 | 20KG | GFS | | 46661 | 32 | RICELAND | 29 | 35 | 700 |
| | | | | | | | MARS CANADA INC. | | | | 6 | | |
| 3261627 | RICE MIX LONG GRN WLD RICE PARBOILED | CS | CS | 6 | 1KG | UNCLE BENS | INC. | 2013 | | | | 14 | 84 |
| 2907517 | CONVERTED | CS | CS | 1 | 20KG | UNCLE BENS | | | 65 | UNCLE BENS | 22 | | |
| | | | | | | | WESTERN RICE MILLS LTD. | | | | 35 | | |
| 3265537 | RICE SUSHI NISHIKI | CS | CS | 1 | 20LB | NISHIKI | LTD. | 5024020 | 339 | WESTERN RICE | 2 | | |
| | | | | | | | WESTERN RICE MILLS LTD. | | | | | | |
| 3261617 | RICE WILD NON ORGAN | CS | CS | 1 | 5LB | TEXANA | LTD. | 16504005 | 15 | GOLDEN BOY | | 21 | 47.727273 |
| | | | | | | | | | | | | | <u>6614kg</u> |

UBC Food Service purchases 6614kg of rice in 2008
6614kg is approximately equal to 6.5tons
0.00110231131092 tons ton = 1 kg