MESM 2011 Group Project Proposal:
An Environmental Impact and Sustainability Analysis of Gills Onions & Rio Farms

Proposers:
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Problem Statement:
Agriculture is a large and extremely important industry in California, accounting for approximately 1.1 million jobs, generating approximately $60 billion in personal income and covering approximately 25% of the total land area of the state1,2. As environmental issues gain more attention across the world, the agricultural industry is experiencing increasing demands from consumers and governments to implement environmentally responsible practices and to demonstrate the sustainability of their operations3. In order to meet these demands, it is essential that growers and processors evaluate and understand the environmental impact of their operations.

Several organizations have begun initiatives to study, measure and implement sustainable practices for the agricultural industry. The Stewardship Index for Specialty Crops (SISC) is currently developing a system of metrics for measuring sustainable performance throughout the specialty crop supply chain3. Some specific industries have been successful in developing similar programs. For example, the Certified California Sustainable Winegrowing program has been successful in providing the education and tools to measure and demonstrate ongoing improvement in environmental stewardship, conservation of natural resources and socially equitable business practices4.

Gills Onions, the nation’s largest year round supplier of processed onions, has been on the forefront of this movement to develop and implement sustainable food processing operations. Gills Onions is currently working with MESM 2010 students on a group project to develop a “Zero Waste Initiative” for their onion processing operation in Oxnard, CA. The project will provide a comprehensive audit and analysis of all of Gills Onions material, energy and water flows, quantify their waste streams, and identify opportunities for reduction, reuse, recycling, or material substitution.

To continue on this path of sustainable innovation, Gills Onions would like to evaluate the environmental impact of their farming operations. In combination, these two group projects would provide Gills Onions with a comprehensive understanding of the environmental impact of their business from the seed to the finished product. This information will enable Gills Onions to continue to be a leader in the development of resource efficient and sustainable farming and food processing practices. In addition, Gills Onions would like to use their knowledge and experience to participate in SISC’s initiative. Ultimately, these Bren group projects will contribute to the development and advancement of the knowledge needed to promote the sustainability of the agriculture in California.

Project Objectives:
The purpose of this group project is to evaluate the environmental impact of Gills Onions’ growing operations called Rio Farms. In order to maintain a year round supply of fresh onions, Rio Farms operates in three different growing regions: Fresno County, Imperial County and Monterey County. This project would evaluate and compare a single lot of land and crops in each of the three regions. The evaluation would focus on every aspect of the farming operation from seed development to harvesting by assessing the environmental footprint of their current practices in terms of water usage, soil enhancements and conservation, pest management, labor, equipment, energy use, and market fluctuation. The implementation of this project will assist Gills Onions/Rio Farms in the following areas:
• Evaluation of the environmental footprint of the current farming operations to establish a baseline for material, water and energy consumption;
• Quantifying the environmental impacts of current practices;
• Identifying opportunities for improvement that would both lessen environmental impact of the operation and result in cost savings for the business;
• Participation in the Sustainable Index for Specialty Crops’ workgroups, possibly in partnership with the Western Growers Association, to develop a system for measuring sustainability performance throughout the specialty crop supply chain.
• Understanding the relationship between sustainability and risk reduction as a means for enhancing long-term viability of the business;
• Preparation for and compliance with possible future environmental regulations.

**Background Information:**
Since its inception 25 years ago, the Gill Family has been firmly committed to environmental stewardship and leadership. Through responsible farming practices and resource conservation they have consistently produced onions of the highest quality without compromising the valuable resources necessary for future generations of people and onions. Gills Onions has been recognized for innovation and excellence in sustainability by the Energy Solutions Center, the California Environmental and Economic Leadership Award bestowed by Governor Schwarzenegger, and the Golden State Award for Engineering Excellence from the American Council of Engineering Companies.

In accordance with these values, Gills Onions is committed to achieving zero waste at their processing facility and administrative offices located in Oxnard, California. Zero waste encompasses a strategy that aims to maximize recycling, minimize waste, and reduce consumption of materials, energy and water. It is a long-term goal attainable through a systematic and incremental approach. Gills Onions is motivated to pursue zero waste initiatives not only because of increasing customer demand, regulatory pressures and economic incentives, but also because it wants to be accountable for its environmental impacts. The company has already taken steps towards reducing its waste, namely by using onion waste to produce energy, and is now looking to the Bren School to provide a holistic analysis of their entire business operation. As described above, Gills Onions is currently working with the Bren School on a 2010 group project that will provide a comprehensive audit and analysis of the processing operation.

Gills Onions is passionate in their mission to provide quality and service to their customers. The key to customer satisfaction is the exploration of new technologies and practices to minimize environmental impact while improving efficiency, product safety and quality. By providing the information and strategic plan requisite for achieving zero waste and sustainability throughout their operations, Bren MESM students can assist Gills Onions in continuing their leadership in agricultural sustainability.

**Stakeholders:**
Other farming and food processing operations interested in reducing the environmental impact and increasing the efficiency of their operations; the Stewardship Index for Specialty Crops and other organizations developing systems for measuring the sustainability of food crops; government agencies interested in the environmental impact of agricultural operations; non-governmental organizations interested in sustainable agriculture.

**Approach:**
Utilize existing data from Gills Onions farming operations to quantify the environmental impact of one lot of onion crops in each of the three growing regions. All inputs to the farming operation including water, energy, pesticides, herbicides, fungicides, fertilizers, labor, equipment and seed stock will be quantified and analyzed. The timing and application methods for inputs will be characterized and compared across the three regions with an eye to
identify best management practices that will maximize yields and minimize inputs and waste. Examples of practices that can be investigated are measurement of soil moisture levels to aid water conservation, use of slow release fertilizers and re-use of equipment such as drip tape. Outputs from the three farming operations will also be quantified including crop yields, runoff, waste and emissions. The effort to quantify all the inputs and outputs to the farming operation will create a baseline for Rio Farms to track and improve the sustainability of its efforts over time.

**Available Data:**

Gills Onions will provide data regarding the farming operations. Each farming operation currently tracks and records all farming practices including fertilizer, insecticide and pesticide application, water usage and cultural practices. At Dresick Farms in the San Joaquin region, information has been recorded using the Tiger Jill, an agriculture management software program from Orange Enterprises, Inc.

**Deliverables:**
The final report and presentation for the project will include:

- A comprehensive baseline evaluation of the environmental footprint including of their farming operations, energy, pesticides, herbicides, fungicides, fertilizers, labor, equipment and seed stock, in the three different growing regions;
- Recommendations and identification of opportunities for environmental improvements and cost savings;
- Development of metrics for measuring the sustainability performance for growing onions that can be used to participate in SISC’s initiative;

**References:**

**Client:**
Gills Onions, LLC
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**Commitment to provide data:**
Gills Onions and Rio Farms are prepared to provide any and all data and information needed for the project. Designated employees (Nikki Rodoni, Bob Martin and Don Arevalos) of Gills Onions/Rio farms will be readily available to answer any questions and provide documentation that is necessary for the project.

**Anticipated Financial Needs and Sources of Support:**
Gills Onions provided financial support when needed for the 2010 project and is again prepared to provide reasonable financial support that is needed for this project as well as modest supervision in coordination with Bren Faculty.

**Internship Opportunities:**
Paid summer internship available to 1 or 2 project members.