

SUSTAINABILITY FEE PROJECT PROPOSAL (2019)

Part I: Applicant Information

1. Date: March 25, 2019

2. Project title: Food Waste Recycling and Education to Promote Sustainability at Georgia Southern University and the Community

3. Amount requested: \$49,078

4. Proposal author/s: Dr. Padmini Shankar, Dr. Evans-Afriyie-Gyawu, Dr. Vinoth Sittaramane

5. Contact information:

Dr. Padmini Shankar, Professor of Nutrition & Food Science, Waters College of Health Professions, 912-478-5785, pshankar@georgiasouthern.edu

Dr. Evans-Afriyie-Gyawu, Associate Professor of Biostatistics, Epidemiology & Environmental Health Sciences, Jiann-Ping Hsu College of Public Health, 912-478-2292, evansafriyiegyawu@georgiasouthern.edu

Dr. Vinoth Sittaramane, Associate Professor of Biology, College of Science and Mathematics, 912-478-5964, vsittaramane@georgiasouthern.edu

6. Unit or Academic department; if a student, year in school, undergraduate or graduate standing: N/A

7. Qualification & Experience:

Explain why you are qualified to carry out this project and any relevant experience you might have (volunteer work, employment, courses, etc.); Explain what roles students will play in your project (if any)?

Dr. Padmini Shankar, PhD, RD, has about 25 years of experience in the areas of nutrition and food science. She is a registered dietitian, and has worked in clinical and community nutrition settings.

Dr. Evans Afriyie-Gyawu, PhD, MPH, has about 19 years of experience in the areas of Toxicology and Public Health, with emphasis on food safety/security, food toxicology and environmental health/hygiene. He has conducted studies in these areas nationally and internationally.

Dr. Vinoth Sittaramane, DVM, PhD, has 20 years of working experience in animal development, zebrafish aquaculture, aquatic and environmental toxicology. His aquaculture research focuses primarily on developing zebrafish microcosms for growth performance & environmental safety studies.

Role of Students in this Project:

Graduate Assistants will:

- Assist in coordinating the entire project
- Participate in data collection (weigh and categorize food waste, and administer surveys), data entry and analysis
- Train other students (contract and volunteers) who participate in the project
- Provide assistance in organizing outreach events
- Coordinate the Digital Poster Contest and serve as judges along with faculty and community representatives
- Monitor the composting process and quality
- Help with setting up the aquaculture and monitor the progress of fish development, collect and analyze data
- Present project-related findings at state, regional, national, and international conferences; also publish papers in reputable journals

Contract Students:

- Work alongside with graduate assistants to implement all project-related tasks
- Assist with data collection and participate in outreach activities

Student volunteers:

- Support the graduate and contract students in all aspects of the project as needed
- Assist with data collection and participate in outreach activities

Part II: Purpose and Description

Sustainability theme - Which aspects of campus sustainability will your project address? Examples: Water, Energy, Waste, Biodiversity, Food, Transportation, Sustainability Promotion, etc.

8. Sustainability theme: RECYCLING OF CAMPUS FOOD WASTE

The proposed project focuses primarily on recycling food waste generated at Georgia Southern student dining facilities for animal feeding, aquaculture, and composting. This project also involves implementing educational intervention strategies aimed at reducing campus food waste.

9. Project Summary:

Summarize your project in two to four sentences. This summary will be posted on the CFS website if your proposal is funded.

The proposed project aims at: 1) collecting the food waste generated from campus dining halls and recycling it into poultry feed, fish flakes, and compost; and 2) develop educational intervention activities including installing interactive LED display units in the dining halls,

organizing student forums and digital poster contest, and coordinating seminars and service-learning events on and off-campus. The expected benefits of this project will be a reduction and sustainable recycling of food waste across the Georgia Southern campus in support of the campus wide sustainability program. Another benefit will be that students will learn and be engaged with the most effective and efficient means of reducing and reusing food waste. Mixed-methods (quantitative and qualitative) study design will be used for this proposed project.

10. Project description:

Briefly define the project goals, total cost, and expected benefits.

According to the EPA, an estimated 22 million pounds of food are wasted each year on college campuses, with an average student contributing about 142 pounds per year. A Phase I project entitled *Reducing Food Waste as Part of Sustainability Efforts on Georgia Southern Campus*, funded by the Center for Sustainability, was conducted by Dr. Evans Afriyie-Gyawu during the 2017/2018 academic year. Findings from this study revealed that approximately one ton (about 2000 pounds) of food is wasted every day in the dining halls on Georgia Southern campus and is typically dumped into landfills. Undoubtedly, the breakdown of organic food materials and subsequent generation of toxic gases from such waste increase environmental pollution.

Below is a tabular representation of the findings from the phase I study:

Description	Fall 2017	Spring 2018
Food waste per student per day (lbs)	0.60	0.54
Food waste for all students per day (lbs)	2,400	2160
Food waste for all students per month (lbs)	72,000	64,800
Food waste for all students per semester for Dining Commons (lbs)*	288,000	259,200
Food waste for all students per semester for Lakeside and Dining Commons**	504,000	453,600

**Average number of students that visit Dining Commons in a day is 4,000*

***Average number of students that visit Dining Commons and Lakeside combined is 7,000*

Given the above data, there is an urgent need to develop a systematic mechanism to sustainably repurpose the campus food waste for the benefit of Georgia Southern campus as well as the surrounding communities.

The investigators of the proposed project have established partnership with local farmers to convert the campus food waste into animal feed and compost. This contribution to assist farmers with the food waste is expected to help generate locally sourced foods that will be made available, through the Farmers Market, to Georgia Southern students (at a discounted rate) and the general public. The compost produced will also be available to the public for sale.

As part of this proposed project, a pilot study will be conducted to explore the feasibility of using campus food waste for aquaculture. According to National Oceanic and Atmospheric Administration (NOAA, 2018), about 84% of seafood consumed in the US is imported and half of that is sourced from aquaculture. Based on Import Alert 16-124, farmed fish from countries such as China, Canada, and Taiwan have been detected with several contaminants raising food safety concerns and alerts from Food and Drug Administration (FDA, 2019). One of the major reasons for the United States to remain a minor player in global aquaculture industry is the high cost involved. To promote economically viable domestic fish farming, the campus-generated food waste will be hygienically converted into fish feed, “*converted fish flakes*” (CFF), for a small-scale aquaculture study in the biology laboratory at Georgia Southern University.

Therefore, the *main objectives* of this proposed Phase II project are to:

- Partner with local farmers in close proximity to GSU to sustainably recycle campus food waste into animal feed and compost, thereby facilitating increased food production.
- Convert portions of the campus food waste into fish flakes that will be used in a pilot study to determine its nutritional viability for aquaculture in order to explore the feasibility of farming fish with food waste in the United States.
- Educate students using intervention programs by creating food waste awareness and promoting sustainable solutions for food waste reduction on Georgia Southern campus.
- Evaluate the effectiveness of the recycling and educational programs implemented on campus with respect to food waste reduction on campus.

Total cost and expected benefits of the project

The total cost of the project will be **\$49,078**. The benefits of the project include the following:

- Recycling and repurposing of campus food waste will ultimately reduce production of toxic gases that contribute to environmental pollution and climate change
- Educational intervention activities are expected to create awareness within the campus community and reduce food waste at Georgia Southern University
- Creating opportunities for service-learning and research activities will help enhance communication and interpersonal skills among students
- Repurposing campus food waste as fish feed is expected to reduce the cost of aquaculture and create more domestic fish farming opportunities

- Partnership with local farmers is expected to increase the availability of locally sourced foods, thereby reducing the carbon footprint
- This project is anticipated to increase awareness about food waste and effective recycling and reduction strategies among local food service establishments and the public at large

Part III: Project Timeline

Project Activity	2019/2020 AY	
	Fall	Spring
Food waste collection		
Animal feeding		
Composting		
Educational interventions		
CFF production and Nutrient Analysis		
Aquaculture		
Education forums (pre-post intervention surveys will be administered to participants of the forums to assess effectiveness)		
Evaluation (of the entire project)		

11. Implementation plan:

Our plan includes the following tasks in order to accomplish the project goals. The investigative team propose to implement the following:

Food waste collection and composting

- Conduct two training sessions for the dining facilities kitchen staff to sort out the food waste in labeled bins. They will be instructed to put the plant food waste and animal food waste in separate bins. Local farmers from Anthony Roots (local farm) will collect these food waste bins every evening. They will use the food waste for feeding animals and the rest will be mixed with wood chips and composted.

- Convert the food waste to compost by mixing the waste with worms, woodchips, manure and other organic matter in a composting shed. This mixture will be piled into three cubic meter mounds, watered and covered. It will be turned, aerated and monitored for pH, temperature and moisture every other day for 20-30 days until the compost is ready. Georgia Southern students will participate in every step of the compost making process.

Educational Intervention strategies

- Provide an educational component to increase awareness regarding the issue of food waste on campus. We propose to install permanent interactive LED display units with touch screen features in the Dining Commons and Lakeside Dining Commons. In collaboration with the Eagles Dining Services Director and other staff, these units will continuously run programmed messages and activities related to food waste and sustainable solutions.
- Collect and analyze the data and organize Food Waste Recycling Forums to present the results. These forums will be open to GSU Southern students, faculty and staff. Additionally, we plan engaging students via Digital Signs on all three campuses (Statesboro, Savannah, and Liberty) using TV monitors. Digital signs on food waste awareness and solutions will be posted after obtaining approval from the Office of Marketing and Communications. Further, flyers will be posted and distributed among students on all three campuses as well.
- Seek funding from Campus Life Enrichment Committee (CLEC) to organize a half-day seminar event. Expert speakers on food waste reduction and environmental sustainability will be invited to give presentations to the campus and local communities.

Converted Fish Flakes (CFF)

- The food waste collected from campus dining facilities will be dehydrated with a food dehydrator and ground using a food processor. The ground waste will be analyzed for nutrient composition, after which nutrient fortification will be done to optimize nutrient profile for fish growth and metabolism. The fortified food waste will be dried and converted to flakes (Converted Fish Flakes - CFF) manually. This CFF will be used for feeding fish in the biology lab on campus. GSU students will be involved every step of this process.

Aquaculture

- Commercial aquaculture fishing mainly involves fish such as Bass, Tilapia, and Carp. However, these fish have longer growth performance timeline (months to years) to reach appropriate harvest/market size. Thus, for this pilot study we will use a well-studied aquaculture and nutrition model, Zebrafish, which has a shorter growth performance timeline (60-90 days). A total of 100 Zebrafish embryos will be harvested and grown to juvenile larval stage (~30 days) with standard lab diets. At Juvenile larval stage, they will be separated into two groups, Group 1 (n=50) will be reared with the standard lab diet and Group 2 (n=50) will be reared with the CFF diet. At the end of 75 days, the adult zebrafish will be analyzed for their growth performance by measuring their length, weight, gender

ratio, feed conversion ratio, Viscerosomatic Index (VSI) and Hepatosomatic Index (HSI). Georgia Southern students will be involved in every step of the aquaculture process.

Evaluations

The following evaluations will be conducted during the grant process:

- Effectiveness of food waste reduction efforts, collection and conversion of foodwaste into animal feed, CFF and compost will be measured using formative (before and during the project) and summative (at the end of study period) evaluation processes.
- Plate waste in the dining halls will be weighed after the educational interventions (forums, LED displays, posters, and seminar) are completed to determine effectiveness of the food waste reduction education efforts.
- Cost-benefit analysis will be performed on animal and aquaculture studies to determine the effectiveness of food waste feeding on growth performance.

Individuals responsible for each implementation step and/or oversight

Responsible Individual	Activity
Dr. Padmini Shankar	PI, oversight of kitchen training procedures, education materials development, student serving-learning activities planning and implementation, develop CLEC proposal to seek funding for offering seminar to promote sustainability
Dr. Evans Afriyie-Gyawu	PI, oversight of coordination of food waste collection and pickup, student forums planning and implementation, data collection & analysis
Dr. Vinoth Sittaramane	PI, oversight of CFF production and aquaculture component of the project, planning and conducting the Food Waste Reduction Poster Contest, data collection, analysis and interpretation.
Mr. Justin Anthony	Local farmer (partner) - Collect and utilize campus food waste for animal feeding and composting, harvesting and processing of foods to be channeled into local markets
Graduate Assistants	Assist in coordinating the entire project; participate in data collection (weigh food waste, produce CFF, Aquaculture), data entry, and data analysis; and train & assist other students who participate in the project
Contract Students	Assist the graduate students with necessary project-related tasks, data collection and entry
Volunteer Students	Assist the graduate and contractual students with necessary project-related tasks, and also assist with data collection and data entry

Part IV: Budget

12. Budget:

Item	Supplier	Quantity	Unit	Unit Price	Total (rounded)
Student Stipends					
DrPH Graduate Assistant	GSU	1	Each	\$12,350	\$12,350
MS Graduate Assistant	GSU	1	Each	\$10,800	\$10,800
Graduate Assistants (Summer)	GSU	2	Each	\$2,000	\$4,000
Contract Students (Undergraduates)	GSU	4	Each	\$1,200	\$4,800
Educational Interventions					
Interactive LED Touchscreen Display Units	Amazon	2	Each	\$3250	\$6500
Flyers and Signage for Intervention Implementation	Eagle Print Shop	1000	Each	\$0.15	\$150
Student Digital Poster Contest Printing	Eagle Print Shop	4	Each	\$40	\$160
Student Digital Poster Contest Awards	---	4		\$75x2 \$50x2	\$250
Converted Fish Flakes (CFF) Production					
Food Processor (BestEquip Food grinder mixer processor)	Walmart.com	1	Each	\$411.99	\$412
Food Dehydrator (Cabela's 10-tray dehydrator)	Walmart.com	1	Each	\$149.99	\$150
Aquaculture					
Aquaculture Tubs (20 gallons)	Agrisupply.com	6	Tubs	\$22	\$132
Submersible Pumps	Agrisupply.com	6	Each	\$35	\$210
Pre- and Post-Nutrient Analysis of Converted Fish Flakes	R L Food Test Labs	2	Each	\$850	\$1700
Fish Nutrient Analysis	Michelson Labs	6	Each	\$700	\$4200
Miscellaneous Supplies (tubing, weights, tapes, thermometers, water testing kits)	Agrisupply.com	--	--	\$500	\$500
Zebrafish (100 fish) and Standard Lab Diet – Cost sharing by faculty					(\$2,000)

12. Budget (Continued):

Item	Supplier	Quantity	Unit	Unit Price	Total (rounded)
Composting					
Red Composting Worms	Gardeners.com	6	Batch	\$36.95	\$222
Compost Aerator	Gardeners.com	2	Each	\$29.95	\$60
Compost Thermometer	Gardeners.com	2	Each	\$24.95	\$50
Compost pH Meter	Gardeners.com	2	Each	\$34.95	\$70
Compost Moisture Meter	Gardeners.com	2	Each	\$30.95	\$62
Food Waste Collection Bins	Amazon	4	Each	\$70.00	\$280
Waste bin liners (100 count bags)	Amazon	15	Each	\$60.00	\$360
Expandable Garden Hose 100-feet	Walmart	1	Each	\$59.99	\$60
Miscellaneous Items for Student Use (Industrial gloves, protective eye glasses, boots, disposable lab coats)	Amazon	--	--	\$500	\$500
Food Waste Surveys Printing	Eagle Print shop	1000	Each	\$0.30	\$300
Meals for Students, Faculty, & Staff Attending the Two Campus-wide Forums	Eagle Dining Catering	100	Each	\$8	\$800
Evaluation (cost sharing by faculty)	GSU	GSU	--	--	--
TOTAL					\$49,078

13. Budget Justification:

Explain how the equipment, supplies, services, etc. will accomplish your project goals. Please provide enough information for the committee to understand the project and its associated costs. For non-expendable (reusable) items, detail how these will be used over the long-term and how they will continue to benefit campus sustainability after the completion of the project. Note that items with general use (i.e. iPads, cameras, etc.) will be stored with CfS after the completion of the project and will be available for check-out for future grants and sustainability-related work.

ITEM	BUDGET JUSTIFICATION
DrPH Graduate Assistant	Assist in coordinating the entire project; participate in data collection (weigh food waste and administer surveys), data entry and analysis; and train/assist other students who participate in the project; help organize forums
MS Graduate Assistant	Aquaculture is a very labor intensive work, so this second graduate biology student will assist with aquaculture set up, monitor, collect, and enter data during Fall (2019) and Spring (2020) semesters; help organize forums
Graduate Assistants (Summer)	MS graduate student will assist in aquaculture data collection and during summer of 2020. DrPH graduate assistant will assist in completing the food waste reduction data collection and analysis, and development of final report
Contract Students	Needed to assist with data collection and entry; help organize forums. Two (2) students are needed in the fall semester (2019) and two (2) in the spring semester (2020). Each student will work 20 hr/week for the first and last weeks of each month, meaning 40 hr/student/month for 3 months => 120 hr/student/semester at \$10/hr = \$1200/student x 4 students = \$4800.00
Educational Intervention	Two Interactive Touchscreen LED display units (\$3250 each x 2 = \$6500) will be permanently installed in the dining halls for running student-friendly messages, games and programs on food waste awareness and reduction. These units can be used to display other health, nutrition and food related messages as well. A campus-wide Digital Poster Contest will be organized for Georgia Southern students, in graduate and undergraduate categories. The top four posters will be competitively selected for monetary awards (2 first-place (\$75 each) and 2 second-place (\$50 each) winners. The four top posters (4 x \$40) will be printed at Eagle Printing Services and displayed at the two main dining halls on campus
Converted Fish Flakes (CFF) Production	
Food waste collection bins	Food waste will have to be collected hygienically in the dining facilities and hence we need to use separate collection bins with lids and liners. We will use four 50-gallon collection bins (\$70.00 each X 4 = \$280) for continual collection of food waste. Though the team would like to reduce the amount of plastic use, liners in each bin is required to reduce odor and microbial growth. Thus, we will use one liner per bin per day during the period of food waste collection (3 months in fall and 3 months in spring). So, it will be 4 bins x 132 liners = 528 liners/year. We will purchase 6 bags (100 liners/bag) for \$60.00 each as required (6 x \$ 60 = \$360)
Food Dehydrator	Food waste will be dried using the food dehydrator to remove moisture from the waste. This will be used daily during the CFF production phase. Heavy duty Cabela's 10-tray dehydrator (\$149.99) will be purchased for this purpose.
Food Processor	Dried food waste will be ground and mixed with other required nutrients to optimize the nutrients in the CFF. One Heavy duty BestEquip food cutter/mixer/grinder & processor (\$ 411.99) will be purchased from Walmart for this purpose.

Nutrient Analysis of Fish Feed	A sample of the food waste will be analyzed for nutrient adequacy by RL Food Testing Laboratory. Based on the results of the first nutrient analyses, the CFF will be fortified with necessary macro- and micro-nutrients for optimal fish growth. Hence, we will test one original food waste sample and one CFF sample at \$850.00 each for a total of $\$850.00 \times 2 = \1700.00 .
Aquaculture Materials	
Zebrafish samples & lab diet (cost-sharing)	Dr. Sittaramane's lab has a growing stock of zebrafish and the standard lab diet to feed them, so we will not have to buy zebrafish or standard lab diets from commercial vendors. We will be saving around \$ 2000.00 during the grant period due to this cost-sharing
20 gallon Aquaculture tub (20 gal.)	We will use six 20-gallon aquaculture tub (\$ 22.00 each $\times 6 = \$132.00$) from Agrisupply.com for rearing zebrafish. 15-20 zebrafish will be reared in each tub. Three tubs will be used for standard lab diets and three tubs for CFF diets
Submersible pump	The aquaculture tub needs circulating water to keep appropriate levels of dissolved oxygen and reduce buildup of unwanted algae and toxic materials. Thus, we will install a submersible water pump (\$35.00 $\times 6 = \$210.00$) in each tub to allow for free water circulation.
Fish Nutrient Analysis	Since we are testing the feasibility of using food waste for aquaculture, we will need to analyze the nutrient quality of the fish grown with the CFF diet. So, the fish raised on standard lab diets (controls) and the CFF diets will be analyzed for nutrient quality. We will have the nutrient profile of a total of 6 fish samples (3 per group) analyzed by the Michelson Laboratories in California. Analyses will cost \$700.00 per sample for a total of \$4200.00 ($\700×6).
Miscellaneous Supplies	Aquaculture setup requires miscellaneous items such as tapes, thermometers, tubing, water testing kits for monitoring the quality of aquaculture. These supplies will be purchased as required and will not exceed \$ 500.00
Composting Materials	
Red Composting worms	Red composting worms will be used initiate and accelerate the composting process of the food waste. We will buy six 1000-worm packs (\$ 36.95 each $\times 6 = \$221.70$). These will be bought as required during the composting process
Compost Monitoring Materials	Composting process needs regular monitoring of the conditions within the compost to identify the stage of compost. Equipment such as Compost pH meter, thermometer, moisture meter, and compost aerator are required. Two Compost aerators (\$29.95 each $\times 2 = \$60.00$) will be used to aerate compost mounds. Two compost pH meters (\$34.95 each $\times 2 = \$70.00$) will be used for regular testing of compost pH to identify the stage of compost. Two compost thermometers (\$24.95 each $\times 2 = \$50.00$) and two compost moisture meters (\$30.95 each $\times 2 = \$60.00$) will be used to monitor the temperature and moisture, respectively.
Miscellaneous Composting Materials	Students will require proper handling and safety equipment to assist with the composting process and these include heavy duty gloves, protective glasses, lab coats, boots and shovels. These supplies will be purchased as required and will not exceed \$ 500.00

Part V: Measurements

14. Project Value:

Detail the value of the project to the student body and the Statesboro campus of Georgia Southern University in terms of sustainability. Explain how your project fulfills the goals of the Sustainability Fee (fee goals are to support Sustainability and Green Initiatives on campus). Describe how (or if) your project will involve students in accomplishing its goals. Projected long and short-term benefits and savings of the proposed project should be adequately documented with assumptions and details provided. Duration of value: how long will the project benefits last? If the period of benefit exceeds the funding period (preferred), how will the project be sustained? Who will oversee the continued operation of the project? Preference will be given to projects with long-term impact.

Value of the project is to sustainably utilize the food waste generated on Georgia Southern campus on a continual basis. Students' feedback from the Phase I project revealed their concern at the enormous amounts of food that is wasted on campus every single day and their interest in finding viable solutions to this ongoing problem. To address the issue of food waste on campus, this project will:

- Allow the campus food waste to be recycled into animal feed and compost. This strategy will reduce the quantity of campus food waste that reaches landfills and ultimately contributes to environmental pollution.
- Allow local farmers who are partnering with us to repurpose the campus food waste into animal feed and compost for farming. This directly creates sustainable food production opportunities for the community, which can be a long-term solution for campus food waste.
- Provide wide-reaching benefits for the community since the eggs, poultry meat, fruits and vegetables that are sourced from using the recycled campus food waste will be made available to the local community. The local farmers are willing to supply their foods to students at discounted rates. Further, the compost will also be sold to the public at the Farmers Market.
- Enable recycling of campus food waste into CFF. As a proof of concept study, we will pilot the processing of campus food waste into CFF for aquaculture and test the growth of fish fed with recycled food waste for optimal gains. Again, this introduces another potential long-term sustainable solution for campus food waste and also promotes economically viable domestic fish farming in the surrounding community using food waste.
- Provide an educational component to increase awareness regarding the issue of food waste on campus. We propose to install permanent touchscreen LED display units in the two Dining Commons areas with interactive features that deals with campus food waste and potential sustainable solutions.

Student involvement is key to the success of this project. We estimate that at least 200 students from interdisciplinary majors (Public Health, Nutrition and Biology) will be involved in this project; some of them will serve as graduate & undergraduate assistants, while others will serve as volunteers. Student-driven projects will focus on increasing awareness on the issue of food waste and provide practical solutions to reducing such waste. Educational materials (posters, flyers, and brochures), food samples production, and TV display digital message development by students in

various classes as part of service-learning project activities will be a part of the outreach program component. This project is intended to create a ripple effect among the student community in terms of sustainability education.

Long-term Impact of the Project

Local farmers who are collaborators on this project are eager and willing to utilize the campus food waste for animal feed and composting on a permanent basis, since this process is of monetary benefit to them in terms of the money saved from buying animal feed. Hence the process of utilizing campus food waste will continue even after the duration of the grant period. Further, this project will increase the service-learning opportunities afforded to students at local farms.

Currently CFS has students volunteering at these farms, but with the increased scope of work afforded by this grant the farmers have agreed to take on more student volunteers to help with the additional tasks generated by this project. We anticipate the aquaculture project will allow for repurposing of campus food waste as fish feed and is expected to reduce the cost of aquaculture and create more domestic fish farming opportunities. All measures proposed through this project aim to reducing food waste on campus and are truly positive steps towards creating a sustainable environment. The benefits of this project warrant securing future funding from other agencies and the investigative team will train and involve lower-division students to continually engage in food waste recycling efforts. It is important to note that our research outcomes will be shared with the CFS, which will use its platform to disseminate this information to promote sustainability on campus.

15. Outreach Plan:

Describe how you will inform the community about the project. Include details on the specific outreach tools, the person(s) responsible and dates. Proposals with no outreach plan will not be considered for funding

The major beneficiaries of this project are Georgia Southern students, faculty and staff, and the local community. Outreach activities will be planned and implemented to specifically target these two entities.

Outreach activities for students will include:

1. Two touchscreen interactive LED display televisions will be permanently installed in the Dining Commons and Lakeside Dining Commons. The investigative team will work with student assistants to program games, test-your-knowledge questions, and interesting tidbits on food waste awareness and reduction strategies onto the LED display units. New messages will be developed by students on a monthly basis and run on a perpetual cycle, which will attract and engage students. Students can stop for a few minutes during meal times, and engage in these activities and games through the touchscreen feature.
2. The investigative team will seek funding through a CLEC grant in September 2019 to bring experts to campus to deliver talks on food waste and its detrimental effects on the

environment. CLEC funding provides up to \$5000 for offering programs on campus and these funds will help plan a seminar during the 2020 No Impact Week.

3. During the 2019-2020 academic year, two forums will be held for students, faculty and staff. The first forum in Fall 2019 will highlight campus food waste reduction strategies and the second forum in Spring 2020 will showcase the findings (and lessons learned) with respect to the proposed project.
4. Student assistants and volunteers involved in this project will present their findings at the Eagles Showcase Service-Learning Symposium in April 2020. This will inform the campus community of the success stories and lessons learned from this project
5. The investigative team expects to partner with the GSU STEM Institute to organize presentations for high school students and their teachers from the local community. The STEM Institute already has ongoing collaborative relationships with several local schools.
6. We will organize a campus-wide Food Waste Reduction Digital Poster Contest in the spring of 2020. Four (two graduate and two undergraduate) award winning posters will be displayed at the Dining Commons and Lakeside Dining Commons.
7. The Farmers Market Festival will be held on the Statesboro campus in April 2020. Service-learning projects utilizing educational materials and food samples prepared from locally sourced ingredients will be showcased by nutrition students at this event.

Outreach activities for the community:

1. Students and faculty involved in this project will set up a booth at the 2019 Green Fest event in October. Interactive games and educational materials that disseminate information on food waste and sustainable solutions will be featured at this event.
2. Nutrition students participate in service-learning activities at the local Farmer's Market every year by displaying educational poster boards and food samples. During the 2019-2020 market season, educational materials and activities at the Statesboro downtown venue will focus on food waste reduction and recycling.

All promotional materials (e.g., posters, flyers and survey instruments) used for this project will carry The Center for Sustainability logo and the statement 'Student Sustainability Fees at Work!'

References:

National Oceanic & Atmospheric Administration. (2018). Fisheries of the United States, 2017 Report. Accessed - <https://www.fisheries.noaa.gov/resource/document/fisheries-united-states-2017-report>

United States Food & Drug Administration. (2019). Import Alert 16-124 – Detention without physical examination of aquaculture seafood products due to unapproved drugs. Accessed - https://www.accessdata.fda.gov/cms_ia/importalert_27.html