

Composting Project

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Composting Proposal

Our names are Danielle Toone and Kayla Watts. We are senior honors students ('22) at Longwood University. A passion of ours is leaving the environment a better place for the future generation through sustainable acts. A specific sustainable act we wish to do this by is composting. There are an abundance of benefits to gain from composting but one we are most interested in is reducing carbon emissions. Food waste creates over 10% of carbon emissions which contribute to the Greenhouse Effect, a serious problem globally which requires action immediately to help preserve the environment for future generations. The past few decades, the Greenhouse Effect has produced detrimental disasters that strike the environment. Distinct effects include the rise of surface temperature and intensity of storms which are exemplified within recent years by natural disasters such as Hurricane Harvey, the forest fires in California, floods, droughts, and heat waves.

We are grateful Longwood already has a composting program which uses food waste from the dining hall, Dorrill Dining Hall, but our goal is to create a program or way for students to contribute their own food waste. The program Longwood has in place only uses post-consumed food. With a campus of more than 5,000 students including staff, and a Farmville population of approximately 8,000, there is much waste that could be utilized. With our strong community values, we wanted to create a program where the outcome not only includes reducing carbon emissions, but creating superior citizen leaders within the honor student population. This helps students take accountability and create a community which augments the environment and Longwood University students, teachers, and surrounding community.

There are many campuses that have programs where students are able to give their food waste for composting. These include Washington & Lee University which can be compared to Longwood due to its size and location. Other universities are Cornell University, University of Arizona, University of Colorado, and many others. Implementing this sustainable program or opportunity where students take an active role in composting their own food waste would make a huge statement and influence on the University.

With this information and these ideas, we had the goal of purchasing a compost tumbler, which could be placed on campus, a possible location could be the pollinator garden. We hope as the program grows, the amount of composting tumblers on campus will increase. The price and specific tumbler we are interested in purchasing depends on where we purchase it from (Lowes, Amazon, Walmart, etc.). We estimate it to hold around 40 gallons and cost around \$100. This is the main and large purchase, but other materials needed include gardening tools such as shovels, gloves, buckets, etc.

For the physical needs, the compost will need to be turned, tended to, and transported. TWe estimate around 5 hours each week will be needed of student volunteers. These duties could be fulfilled through specific clubs and organizations that may be interested such as the environmental club, honors students, and have even pondered the idea of creating a composting club specifically for students who are highly interested in composting and sustainability.

With the recent Virginia legislation regarding sustainability, if this project were to be successful, we would be interested in proposing a grant. The UN Climate Change Conference (COP26) occurred from 31 October to 13 November 2021 and will have a lasting impact on implementing sustainability, specifically into businesses. Longwood would benefit greatly from implementing more sustainable programs, specifically a composting one, as many schools and businesses are executing these new values. This could also be a way for Longwood to attract prospective students, especially ones who value sustainability. Longwood would also benefit financially as well as you will see below.

Please reach out to us if you have any questions or need more information. You can reach us at danielle.toone@live.longwood.edu and kayla.watts@live.longwood.edu. Thank you.

Financial Analysis

The financial analysis of composting can be broken down into economic, environmental, and social cost benefits. We based these numbers off Universities who have a legit composting program either comparable in size, found national averages, or we calculated based on comparison of Longwood and said University.

Economic

These costs include the cost avoidance from not using fertilizer and any composting sales if Longwood was to pair with the community.

- Estimating one ton of compost is equivalent to one cubic yard of compost
- Amount per cubic yard of compost estimated through various research online

\$30 per cubic yard of compost * 400 tons of compost = \$12,000 the university does not have to spend on compost

Environmental

These costs are difficult to calculate. They include diverting waste from the landfill to improve water, reduce pollution, reduce carbon, returns important nutrients into the soil, lowers run off and nitrogen leaching, potentially suppress plant diseases, weeds, and parasites to improve the landscape of the university.

- Ithaca College → enrollment of around 6,000 produces 5 tons of composting per week from their cafeteria
- Middlebury College → enrollment of around 2,500 produces approximately 250 tons of food and paper waste each year
- The cost for food waste per tons per year is includes the dining hall and other University sanctioned sources such as restaurants in the Student Union, Moe's Southwest Grill, Chick-fil-a, etc, and students, faculty, and Longwood community contributions
- Landfill diversion costs include transportation and fees from the landfill
- The cost for landfill diversion per ton of trash was estimated using national averages and based on Middlebury's waste diversion annual savings

\$100 per ton of trash * 400 tons per year = \$40,000 per year of food waste diversion from the landfill

Social

Quite a few of the societal costs of food wastage overlap with the environment such as greenhouse gas emissions, water pollution costs, and soil erosion. Other social benefits include creating an opportunity to conduct research and educate students and community members.

Estimated total savings

\$40,000 per year of landfill diversion + \$12,000 per year of avoidance cost for compost =
\$52,000 of annual savings

Project Post-Mortem

The purpose of this analysis is to determine what went well for this project and what can be improved. Our ultimate goal for this project was to purchase a composting tumbler to kick start the program. We gathered much background information so we could feel comfortable and competent reaching out to many others. This background research included benefits of composting, how to compost, how to create a composting tumbler, other university programs who successfully compost, cost-benefits of university composting, student volunteer hours and more. We then had to use this new knowledge and reach out to many individuals regarding how we could actually start this program. Some individuals we reached out to include, Justin Ellis (honors professor with extensive knowledge in ecology and sustainability), Jessi Zonosko (Senior Director of the Cormier Honors College), David Love (Director of Landscape and Grounds/Sustainability), Sherry Swinson (Director of Hull Springs/Sustainability), and Chris Kukk (Dean of the Cormier Honors College).

One of our first roadblocks was getting redirected by many of the individuals or not receiving a response. After countless follow-ups and deflections, with the encouragement of our professor Jacob Dolence, we built our own composting bin. This was already towards the end of the semester so we were not able to start the compost before our presentation day. Which led us to another issue, time. In order to make improvements to this project, it would be suggested to start earlier. Especially with all the tasks that needed to be completed, it would have benefited us to start the researching and reaching out processes earlier.

Creating an end goal with a specific, dated outline of how steps to achieve it would have strengthened this program. At some points throughout this semester the magnitude of this project did feel overwhelming. The creation of specific deadlines could have eliminated those feelings. Our professor, Jacob Dolence provided us with an abundance of resources and support throughout the semester for this project. It was an enjoyable experience especially because of our passion for composting and sustainability. We not only created this outline plan for a potential future program, but many other indirect accomplishments we can use throughout our future experiences.

References

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