Waste Disposal Action Plan for St. Mary's College Pub

An Independent Sustainability Project
Submitted for Consideration to Professor Barry Muchnick
For ENST 450: Applied Sustainability Practicum

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Executive Summary

To promote a more sustainable St. Mary's I am going to increase organization and efficiency of waste disposal practices at the Pub/Grab & Go on campus. Through the introduction of effective signage, the sorting of waste between compostable material, recyclable material, and trash will be improved. Sorting these waste types will increase the amount of compostable and recyclable material produced on campus, as well as decrease the college's total garbage output. This initiative will improve the college's waste disposal practices by diverting a large portion of waste from going to the landfill, supplying the school with increased amounts of compost for the campus farm, and promoting environmental stewardship across campus. Due to the simplistic nature of this sorting system, it is not constrained by scale or location. This plan can be replicated, scaled up or down, installed anywhere on campus, or even beyond the college's boundaries. Introducing improved waste sorting practices to the Pub is a simple, straightforward way of promoting greater sustainability on campus, as well as initiating a far-reaching effect on the greater world.

Introduction

Climate change is often labeled as one of the largest problems of the twenty-first century. There are many components that contribute to climate change including burning coal and oil, practicing industrial agriculture, and clear-cutting rainforests. There are countless factors that contribute to the growing problem of climate change, but one considerable suspect is the improper disposal of waste.

Focusing on waste disposal is a great way to promote sustainability and make a positive impact on climate change because it holds the opportunity to both negatively and positively affect the environment in a sizable way. When it comes to the negative aspects of garbage disposal, the direct effects on the environment are extensive: landfills leaching harmful chemicals into groundwater, incinerators releasing toxins into the air, garbage trucks puffing out greenhouse gases as they transport waste, and litter tainting the landscape far and wide. With that said, the United States (US) is currently the world's number one producer of garbage: home to just 4 percent of the global population, the US consumes 30 percent of all the planet's resources and produces 30 percent of all its waste. Given this statistic, it is apparent that the US is not managing its waste in a sustainable fashion, and has a lot of room for improvement. Today, only 5 percent of all plastic is recycled, while almost two-thirds of all glass containers and half of aluminum beverage cans get trashed[1]. With a possible 95 percent increase in efficiency, recycling programs have undeniable potential to substantially cut the amount of waste being labeled as trash.

Another major contributor to the municipal solid waste (MSW) found in landfills is organic food waste. Food waste (food scraps) includes organic matter that can be broken down (composted) into soil. This is an extremely beneficial process because it produces precious soil

nutrients while simultaneously lowering garbage levels. In fact, organic food waste accounts for about one-quarter of the total MSW[2]. Furthering the development of compost practices has the opportunity to reclaim a large sum of the material that would otherwise be labeled as garbage. Together, composting and recycling have unlimited potential to lower aggregate MSW levels.

Since waste disposal has such a massive impact on the health of the environment, and has such a large margin for improvement, I am initiating a project that will promote better waste disposal practices at St. Mary's College of Maryland. This new initiative will involve the production and implementation of instructional signage above waste receptacles at the campus Pub. The signs will help distinguish between three different forms of waste: recycling, compost, and trash.

The goal of this initiative is to organize the different forms of waste in a way that maximizes proper sorting of waste items. Improved sorting of waste will result in an increased amount of material diverted from the landfill and an increased amount of recyclable and compostable material. Beyond the material benefits, this sorting system will also be economically and educationally valuable. Since more waste will be diverted to compost and recycling, the college will save money by decreasing the amount of garbage pickups needed on campus. The college will also benefit economically because the increased amounts of compostable waste will produce rich fertile soil for the campus farm. This soil can be used on plant beds across campus for zero cost as well. This waste sorting system also acts as an educational tool for students because as students actively engage in the sorting of their food waste, they are gaining a better understanding of their impact on the campus and the greater world.

Context

In order to promote a more sustainable St. Mary's and create effective waste disposal practices at the Pub, it is necessary to analyze a variety of subject fields. While compiling information to create this dynamic system, I researched sources containing a wide variety of angles on the topic. These sources contained various points of focus including efficiency, psychological, anthropological, and food system related. It is extremely beneficial to unveil the points behind these various perspectives because it strengthens the project from a variety of vantage points.

While researching the article *An Urban Composting Centre As Cultural Incentive For Food* it became apparent how necessary precise sorting of waste truly is. All forms of waste benefit from being properly sorted, but for compost, proper sorting is an absolute necessity. The production of high quality compost from the food waste fraction of solid municipal waste requires at-the-source sorting to eliminate any contact with non-organic contaminants.[3] In order for compost to be properly cultivated and utilized to its full potential, steps need to be made to enforce proper waste disposal at the source. My project will help promote proper at-the-source sorting by having students actively separate their compost, recycling, and trash. All three of these waste disposal options will be located in the same area to help promote appropriate sorting among all of the waste options. Having all three options within close proximity will allow the students to easily sort their own waste and support the initial organization of waste. Encouraging separation of waste types at the source will allow the items to be utilized in their proper fashion. Recycling will contain no trash material, and will be able to be recycled into new items. Compostable material will be free from contamination and will go on to develop into fertile soil. The amount of trash material going to the landfill will be lessened.

While at-the-source waste disposal is necessary for an efficient waste sorting system, it is also necessary to consider the psychology that goes into convincing people to properly sort their waste. A study on the psychology behind recycling found that in households of three or more individuals, sharing the same receptacle drastically improves waste sorting. The conclusion of the study is that people are driven by shame and fear of punishment when having to share a common receptacle[4]. This knowledge is very useful in creating a successful waste sorting system in the Pub because sorting participation could be improved by creating a sense of community around the system. This could be done by reaching out to all members of the campus community that are affected by waste disposal in the Pub. Contacting the workers at the Pub and Grab & Go, the cleaning staff that takes out the trash, and the students who are the consumers and patrons of the system will allow for a sense of community to be made. If each of these groups could have a conscious understanding of the goal at hand, more people will be willing to support appropriate sorting of waste. Displaying waste distribution in a way that triggers people's desire to act communally will be beneficial to the system.

An anthropological perspective must also be taken into account to maximize the efficiency of the system because what constitutes "waste" is a highly subjective concept among different cultures. Waste can be seen as a risk to the public health and the environment, an aesthetic inconvenience, a source of income, and even a social contagion[5]. In an effort to tend to a variety of different cultural backgrounds, my project will try to solve each of these subjective definitions of waste. In order to settle the possible risk towards public health and the environment I will put people at ease by assuring safety and providing examples of positive impacts that sustainable waste disposal will cause. To help mask the aesthetic inconvenience of the waste, I will create attractive signage that will inform and garnish the existing waste

receptacles. In order to display the new system in a fashion that will attract those looking for waste as a source of income, I can possibly display facts about how their participation in waste distribution is having a positive impact on them individually. For example, organic items disposed of in the compost bin get sent to the campus farm where the waste is composted then used as soil that in turn produces some of the food they eat in the Great Room. Keeping an open mind about how different cultures may perceive the Pub's waste receptacles will help give the new system traction from a variety of different angles.

Addressing waste disposal problems in terms of its relation to the food industry is significant because in order to promote positive change in small locations like the St. Mary's Pub, the greater food system must be understood. In the current food system it is believed that waste disposal techniques haven't met the standards of the commodity foods that people have become obsessed with. Since the Pub specializes in the sales of commodified processed foods, it stands as a great opportunity to challenge this idea. If a waste disposal system can prove to be successful among exclusively commodified foods, then the system can be considered prosperous in many different settings.

Case Studies

The implementation of effective signage to promote improved waste organization is a popular topic among college campuses, offices, and many other locations. In order to construct the best waste sorting system for the Pub at St. Mary's College, it is necessary that some of these case studies be closely analyzed. Studying what people have done in past projects is extraordinarily helpful in constructing a new original one because successful parts of the projects can be borrowed or excluded depending on how well they previously worked. Borrowing and

excluding certain pieces of past projects will result in a great culmination of things that have worked in the past, as well as new original ideas.

While researching possible methods to incorporate into my project, I came across a few different case studies, each connecting to the topic in their own unique way. These sources provided valuable insight as to what has been done and what works the best. A study completed at the University of Utah focused on how instructional signs are used to distinguish between recycling and trash. The study specifically focused on how schema-sensitive material could influence participation in the separation of waste between recyclables and trash items. The study was comprised of two different tests. In the first test, signage was placed just below the lid of the receptacle with words including "Choose to Recycle" and "Thank You." The signs also went into great detail about recycling versus garbage and the effects of each. Soon after the study began, a few problems were apparent: the signs were located too far below the line of sight, the signs contained too much information than could be fully appreciated in the few seconds the patrons were willing to give to the task, and the signage did not stress what recyclables could not be placed in the bin. In an effort to solve many of these problems, signage was reconstructed for the second test. The signs increased in size, the font size was enlarged so that it could be seen from the other side of the room, and the message was broken into two short segments for quicker apprehension. In large font, the message prompted recycling, and smaller font supplied the finer details of proper recycling[6]. This study is exceedingly helpful in organizing the presentation of my own signage because my project will depart and add on to the work accomplished by this study. In order to promote improved sorting of waste, my signs will be placed at eyelevel, will contain titles with large font, and include minimal wording. In fact, my signs will not include much wording at all. Rather than creating extensive lists of what can or cannot be placed in a

bin, I will place images of items commonly used at the Pub and Grab & Go. Since detailed lists were not very useful in the University of Utah study, I believe that using pictures to identify what goes where will promote greater participation among patrons.

Another study, completed at Florida State University, sought to increase successful recycling organization in order to reduce the total MSW. Trying to reduce the MSW in this way is a great goal because out of the total amount of MSW produced every year, recyclable paper and paperboard constitute approximately 41 percent. This particular study also took place in an office environment containing lot of potentially recyclable paper. Prompting better recycling practices in this environment is a great idea because it has a large opportunity for success. The study's main focus was on the effects of prompts on recycling behavior within two different buildings. Within each department two signs were posted—one prompting recycling and the other trash disposal. In order to collect data displaying participation of proper waste disposal the number of contaminated items was counted in each bin (trash items in the recycling, or recycling items found in the trash). After considerable data was retrieved, the study proved that signs and receptacles in close proximity result in a 29 percent baseline improvement.[7] This study proved to be successful, and was able to display its validity through extensive empirical data. In order to give my waste disposal project greater legitimacy, it would be beneficial to take similar data measurements on the separation of recyclables, compostable items, and trash items. This could be done by counting the number of contamination items in each bin, or could possibly be done by weighing each of the respective receptacles. Regardless of the data collecting method, this study revealed the importance and power behind utilizing empirical evidence.

One last case study that provided valuable insight for my project was completed at the University of Western Michigan. The study tested whether providing improved recycling

signage would decrease contamination between trash and recycling. The goal of the project was driven by the idea that if recycling waste were contaminated, it would be rejected by the processing facility and be landfilled instead of recycled. In order to satisfy their goal of proper organization of trash versus recycling, this study included signage designating trash as "landfill," and recycling as "recycling."[8] The simple change from trash to landfill supplied quite a large change in how people disposed of their waste. Patrons have become so accustomed to see the word trash that hardly any thought is given as they throw away their waste. Landfill, on the other hand, triggers schema that allows individuals to evaluate the impact they are making while they are placing a waste item in the bin. This study was very helpful in the development of my own project because it expanded the possibilities of signage beyond the typical recycling, trash arrangement. By switching the label of the trash sign to "landfill" students will surely be more intrigued and inclined to separate their waste before placing everything in the trash.

Each of these case studies included unique methods on how to maximize recycling efficiency via signage. Each source provided its own vocation within the process, and displayed the best practices, as well as the parts of the project that didn't work so well. Using all of this previous trial and error will allow the waste disposal system in the Pub to be mapped out in a way that will touch on the strengths from each of the previous studies, as well as learn from previous mistakes.

Project Overview

In order to promote a more sustainable St. Mary's I am proposing the introduction of a three-way waste receptacle system to the Pub on campus. This receptacle system will improve the sorting between compostable, recyclable, and trash items. The system aims to improve the

organization between the three waste groups, as well as to increase the amount of recyclable and compostable material coming out of the Pub. This system will reduce the amount of trash generated and increase awareness about waste disposal on campus. On a grander scale, these new changes will lower greenhouse gas emissions and help St. Mary's reach their goal of climate neutrality by 2020. Making these changes to the Pub, owned and operated by catering company Café Bon Appetite, will also help to strengthen the high sustainability ethic that the company holds. By improving the waste disposal methods in one of Bon Appetite's locations, their mission of cooking delicious food that is good for you, the animals, the workers, the community, and the Earth will be enhanced.

Currently the waste disposal system in the Pub is comprised of a number of trash and recycling receptacles (four trash, three recycling); however, there is ambiguity over what forms of waste go where. There is minimal signage that designates the bins as either trash or recycling, and the bins are dispersed about the Pub in a manner that does not induce proper separation of recycling and trash. In addition to the confusion between trash and recycling at the Pub, composting options of disposal are non-existent. The addition of a compost bin in the pub could greatly impact its waste flow because much of the food served at the pub has the potential to be composted rather than being sent to the landfill. The compostable material could instead be sent to the campus farm for decomposition, or possible local composting companies such as Chesapeake's Bounty. Both of these locations could benefit from the organic waste being collected from the Pub because it would increase their output of rich fertile soil. There are amazing benefits that could extend from the waste sorting in the Pub, but in order to reap the benefits, the material needs to be efficiently organized.

In order to create an environment suitable for waste organization in the Pub, the process needs to be simplified to the point where patrons are able to participate while doing as little work as possible. In an effort to create a system where people can quickly and easily participate in proper waste sorting, I incorporated several different properties into the system. The primary factor in promoting participation is production of attractive and informative signage. The signs are 8.5x11 inches, laminated, and placed above the existing recycling and trash receptacles at eye level (approximately 5'7''). There will also soon be implementation of a sign concerning composting as well as the introduction of a new composting receptacle. The signage for each of these waste options will include a large-font title prompting either compost, recycling, or landfill. Following the prompt will be pictures of common waste items found at the Pub / Grab & Go. Providing pictures of common waste items will allow patrons to quickly identify exactly where to dispose of their waste. Using pictures rather than extensive lists of materials is more conducive for proper waste disposal because patrons will be attracted more by images than wording. The goal of the signs is to produce an information source that will attract patrons as well as efficiently instruct them on how to properly dispose of their waste within the three-way system.

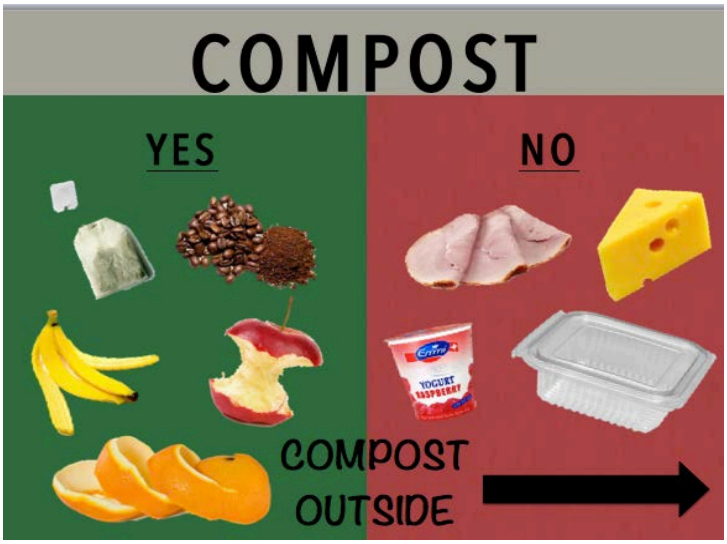
Participation will also be optimized by the organization of the waste receptacles themselves. Arranging the receptacles so that they are located in the same common area will improve waste sorting because patrons will have all waste options located within reaching distance of each other. Rather than having the receptacles located in random areas throughout the Pub, keeping them all in one common area will enhance productivity. Having all waste options within the same area will increase organizational productivity. In addition to placing all of the receptacles together, the order of receptacles also plays a major role in promoting greater

productivity. The order of the waste options has the ability to stress various forms of waste over others. Placing the compost and recycling receptacle to the left of the landfill option will allow for patrons to discard of there organic and recyclables before they hastily throw it all in the landfill bin. Since students will be moving from left to right, placing the landfill receptacle on the far right will allow for greater participation in the other two receptacles before disposing of the rest of their waste in the trash.

This waste sorting system is currently up and running at the Pub, but is not yet functioning at full capacity. The compost segment of the system has yet to be introduced, so currently the system only includes the recycling and landfill options. All methods are being followed including the sign's characteristics, the location of the receptacles, and the order of receptacles. Once the compost sign and receptacle are implemented, the system will be able to operate with maximum efficiency.


RECYCLE


LANDFILL
Cheetos


COMPOST
YES
NO
YOGURT
RASPBERRY
COMPOST
OUTSIDE

Outcomes

The introduction of something as simple as a waste distribution system has yielded far more work than I originally thought. As my project has developed over the past several months, the methods have evolved greatly. The original plan was to materialize an industrial made waste-sorting receptacle that would provide separation between compostable items, several forms of recyclables, and trash. The thousand-dollar industrial made receptacle has its benefits, but for the purposes of my project, it quickly became an idea of the past. Instead, a more economical approach of producing my very own signage and purchasing individual trash bins that could be reconfigured a three-way system became clear. This method was a step in the right direction, but it still did not fit the constraints of my project. The third phase of my project's evolution was to produce my own signage, and work with the existing waste receptacles in the Pub.

Using the infrastructure that is already present in the Pub is good for several reasons: economic efficiency, ecological effectiveness, and social stability. Refurbishing the current waste bins rather than buying new ones is economically efficient because it is low in cost. Using the existing recycling and trash bins in the Pub takes away the cost of having to purchase these expensive items. As for composting, the Pub has no current composting bin, but they can be easily accessed through the Sustainability Office for a minor price. Working in this way is also ecologically effective because when materials are reused, it prevents the old receptacles from becoming trash themselves. Using the current receptacles also helps settle the concept that in order for a problem to be solved, money has to be spent on a new commodity. Refurbishment can prove to be just as successful as buying new items, maybe even more when thinking ecologically. Lastly, this technique is supportive socially because it is helping educate the St.

Mary's campus on sustainability. When the students at the Pub participate in the active separation of their waste, they are not only increasing the amount of compostable and recyclable material and decreasing garbage going to the landfill, they are learning about how their impact on the greater world.

If I were to change my methods of creating the waste receptacle system I would not take anything away from what I have done, but I would like to make several additions. One of these additions would be to include signage to inform students of the communal plastic bag holder. Since plastic bags are one of the number one instigators in compost and recycling contamination, informing people about the proper place of disposal could save a lot of waste contamination. Reusing the plastic bags would also have a great environmental impact because there would be fewer bags sent to the landfills as well as fewer bags littering the landscape. Another possible addition to my project would be to add signage that incentivizes users rather than just inform. Providing quick snippets of information or fun facts about how their action of properly disposing their waste could affect the world, or how their actions could provide intrinsic benefits for themselves. Both of these additions are fairly minor steps that could possibly increase student participation in waste separation and promote greater sustainability on campus.

Conclusions

The Pub has had both recycling and trash receptacles for some time now, but little work has been done to actualize the separation of the types of waste. In an effort to implement improved waste sorting at the Pub and kick start more efficient waste sorting across campus I want to improve upon the existing waste system. Developing more sustainable methods of disposing waste while working within the current system has the potential to be very successful.

Integrating sustainable ideas using already standing materials, I hope to make a lasting difference on the Pub's waste disposal without drastically changing their system. Finding the simplistic yet effective route in this situation will be a powerful way to initiate sustainable practices in the Pub going into the future. The goal of this initiative is to increase productivity of sorting waste at the Pub, but the scope of the initiative must not be constrained by the boundaries of the Pub. This waste sorting system is made to be simplistic so that it can be moved, scaled up or down, and tailored to work efficiently in any setting. This system has the potential to make a great impact on the sorting of waste at the Pub, but also the entire St. Mary's campus, and even beyond the campus' boundaries. This initiative truly has the ability to affect the St. Mary's campus community and the greater world in a substantial way.

Recommendations

St. Mary's has ample opportunity to expand their waste disposal practices. The Pub is a great area on campus to initiate change due to its small-scale and minimal regulations. To increase the productivity of the waste sorting system at the Pub, further work needs to be done to connect Pub workers and maintenance staff to the project. If the Pub workers are made more aware of the initiative, there will be greater support for the system. Sorting of waste could also be incorporated into the Pub's kitchen because a lot of food waste is generated as the workers are cooking food.

Connecting with maintenance staff stands as an important piece in making this system successful because they are the ones discarding of the waste at the end of the day. If the system is going to carry its validity, there needs to be certainty over whether these workers are correctly disposing of the recycling and trash materials in their respective dumpster.

Lastly, when the compost segment of the system is introduced, it needs to be incorporated into the weekly compost pickup done on campus. If the Pub's compost could be institutionalized into the already existing pickup system, it will be very efficient and there would be no additional work for the maintenance staff.

I have made large steps in reaching my goal of creating a successful waste sorting system at the Pub, but further steps need to be made in order for this system to work at full capacity. The next level of this initiative will primarily involve greater institutionalization of the system into the college community. All people in the campus community, including the Pub workers, the maintenance staff members, and students need to be made more aware of the goals of the project and how it is integrated with the current structure of the college. Large steps are still required in actualizing this project, but great efforts have been made to get it where it currently stands.

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