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Waste Management Practices of Local Tourist Attractions: Basis for Policy Recommendation

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Abstract — The study aimed to find out the waste management practices along Refuse, Reuse, Reduce, Recycle, and Rot among the local tourist attractions of Zamboanga del Norte First District during the Academic Year 2022 towards a policy recommendation. The quantitative method of research, utilizing a self-made questionnaire checklist, was used to obtain the desired data. Data revealed that the local tourist attractions practiced waste management in their business operations. However, some attraction sites did not strictly impose such waste management practices, which led to a recommendation to consistently and strictly implement solid waste management among business owners of these tourist attractions. Local government units, the academe, and the tourism sector may help reinforce these practices so that they are maintained at all times to promote sustainability in implementing the waste reduction policy. There should be clear signs across the site, while leaflets for solid waste management awareness may be distributed to the local tourists. The researcher proposed a policy recommendation that business owners may utilize.

Keywords — Solid waste management, stakeholders, sustainability, tourist attractions, zero waste

I. Introduction

In addition to rapid economic development and the ever-increasing human population, governments are confronted with significant environmental challenges, such as trash management. It is a multifaceted problem that is important to every person on the planet. Technology, economics, socio-cultural activities, and political endeavors are all necessary components for reducing the hazards of contamination brought about by this situation. There is evidence that most of the waste generated worldwide has not been subjected to appropriate treatment and disposal, which may result in problems for the environment and the economy. This has the potential to be a source of pollution since trash has several significant negative consequences on the community, including pollution of the environment and water, destruction of habitats, and the transmission of diseases. The waste management techniques were being improved, and efforts were being made by companies and governments worldwide to cut down on the quantity of waste produced. This necessitates the implementation of a variety of techniques, ranging from trash reduction and recycling to the creation of technologies for waste disposal.

Effective waste management may include collaboration between government agencies, commercial corporations, community organizations, and investments in infrastructure and technology. Globally, however, it is one of the sectors with the least emphasis on financial

allocations and strengthening structures. The improper management of these wastes can result in significant and irreversible direct and indirect repercussions on the environment, the economy, and society.

Urbanization and technological advancement alike. One-third of the world's garbage is managed in environmentally hazardous ways, such as littering, open dumping, open burning, and filthy landfills, among other practices (Kaza et al., 2018). This is the case even though technology advancements and engineering solutions have been developed.

Following this, there have been many encouraging improvements in waste management. New policies and regulations are being implemented in countries worldwide to promote waste reduction and recycling. Additionally, numerous creative ways are being created to enhance waste management practices. Some municipalities are implementing zero-waste projects, which are designed to completely eradicate waste by drastically reducing, reusing, and recycling goods.

On a global scale, around 85 percent of the collected waste is transferred to landfills, which may include uncontrolled dumps and open dumping. In comparison, only 15 percent of the collected rubbish is recycled (Zaman, 2019). There are roughly 2.01 billion metric tons of municipal solid waste (MSW) generated year around the world, according to Kaza et al. (2018), and it is anticipated that the amount of MSW generated might increase to 3.4 billion metric tons by the year 2050. Moreover, according to his research, only around 13.5% of the municipal solid waste produced worldwide gets recycled, while only about 5.5% is composted. Therefore, the residual waste is either transferred to landfills or burned, contributing to environmental and human health issues. According to Hoornweg et al.'s 2019 research, the global generation of municipal solid waste was predicted to be approximately 2.01 billion metric tons in 2018, and it is projected to increase to 3.4 billion metric tons by the year 2050. It has been determined that San Francisco is one of the cities that possesses the most resources in terms of trash management services.

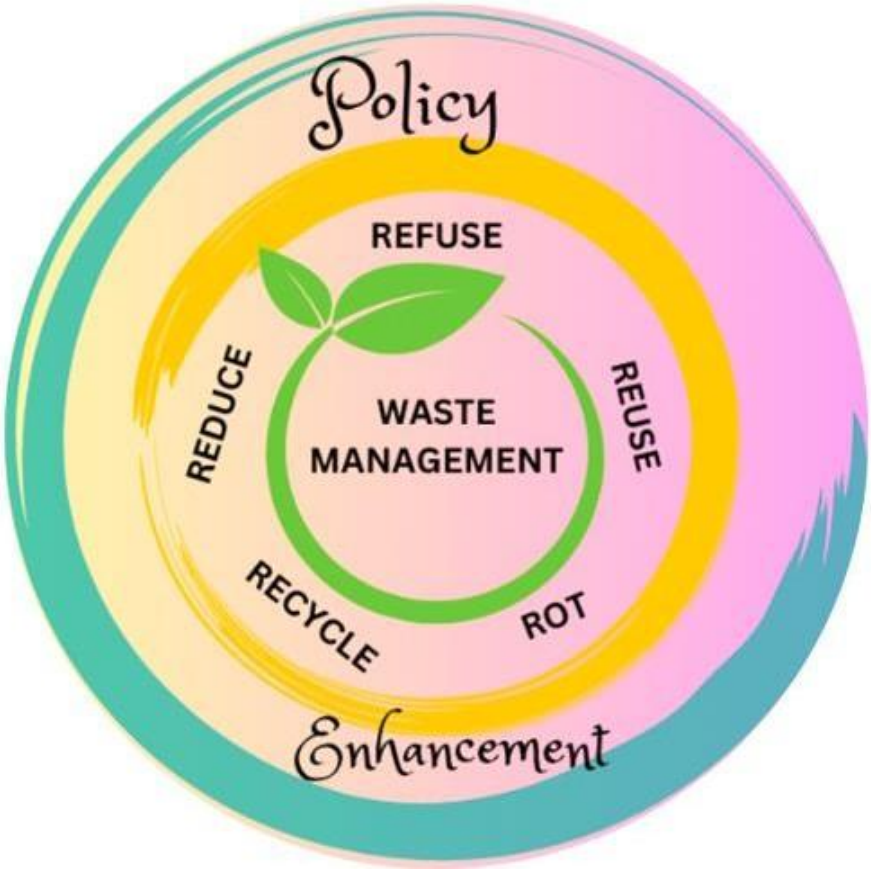
According to Environment (2019), the recycling rate can be improved even more by implementing an appropriate system (Zaman, 2022). In 2018, the United States created 292.4 million tons of municipal solid waste, equivalent to 4.9 pounds of trash per person per day, according to estimates provided by the Environmental Protection Agency (EPA) (EPA, 2021). About thirty-six percent of all manufactured plastics are used for packaging, including single-use plastic goods for food and beverage containers. Approximately eighty-five percent of these products are left in landfills or are considered unregulated garbage. In addition, the United Kingdom produced around 221 million tons of Microsoft Windows in 2016, of which approximately 44% was recycled, 32% was disposed of in landfills, and 24% was burned (Zhen et al., 2019).

The Philippine government enacted the Ecological Solid Waste Management Act (RA 9003) in 2000 to address environmental concerns. The Act provides for an ecological solid waste management program, institutional mechanisms, incentives, penalties, and funding. The Local

Government Code implements and enforces the Act within its jurisdiction. The barangay level segregates and collects biodegradable, compostable, and reusable waste, while municipalities and cities collect special trash and non-recyclable items.

The study identified a gap in determining tourist attractions' waste management policies and regulations. The lack of proper regulation and enforcement can lead to inadequate waste management practices, negatively impacting the environment and local communities. The researcher conducted the study in the First District of Zamboanga del Norte and developed a policy recommendation to support and improve existing waste management practices in local tourist attractions towards promoting sustainable waste management practices, reducing environmental impacts, and enhancing tourism.

It involves a whole-system approach to waste management, designing products and systems that minimize waste and maximize resource efficiency. Hence, several theories can be applied for waste management, including the Waste Hierarchy, which provides options ranging from most to least preferable based on their environmental impact. The hierarchy includes options such as prevention, reuse, recycling, and disposal, which can guide waste management decisions. Johnson (2020) suggested ways of using the inverted pyramid to move towards a waste-free society through the 5Rs of the Zero Waste method to attain zero waste, which is the refuse, reuse, reduce, recycle, and rot.



II. Methodology

This study aims to determine the waste management practices of selected local tourist attractions located in the 1st District of Zamboanga del Norte, such as the municipalities of Dapitan, Polanco, Piñan, Sergio Osmeña, Rizal, and Mutia. In identifying a tourist attraction, the following criteria must be considered: uniqueness of natural beauty, historical/cultural value, accessibility, availability of basic utilities, availability of onsite facilities, and quality of surroundings.

The identified respondents include business owners, employees, and tourists who visited the local tourist attractions between October and November 2022. It was limited to the 5Rs provided by Johnson (2020), which include refuse, reduce, reuse, recycle, and rot. The data gathered was based on a checklist-style self-made questionnaire. Another limitation of the study was the non-participation of some respondents due to the limited duration of the visit in the area and other relevant reasons. The study did not cover waste management practices outside the selected location in different districts and municipalities. Therefore, other factors that may affect waste management practices, such as cultural practices and socio-economic factors, have not been explored.

Waste Management

The government's private and public sectors must properly implement ecological Solid Waste Management for tourist attractions for a sustainable and positive environmental impact, specifically in the tourism industry. Many studies are being carried out in this area since waste generation has risen over the last few years, making waste management a challenging issue in the 21st century. First, it is essential to define waste in order to manage it successfully. All activities produce waste, and although it is a locally arising problem, it has local and global effects. Societies need to dispose of their waste products, creating a source of environmental pollution. Physical sciences, engineering, economics, ecology, human behavior, entrepreneurship, and good governance must be linked with skills and knowledge to regulate garbage sustainably.

Globally, around 85% of the collected waste is sent to landfills, including uncontrolled landfills and open dumping, and only 15% of the collected waste is recycled Zaman (2019). The first zero-waste strategy was adopted in 2005 under the Urban Environmental Accords to achieve a waste-free city by 2020. In 2018, the global municipal solid waste generation was estimated to be around 2.01 billion metric tons, projected to increase to 3.4 billion metric tons by 2050 (Hoornweg et al., 2019). San Francisco has been identified as one of the most resourceful cities regarding waste management services. The landfill waste in San Francisco has consisted of 31% organics, 23% paper, 23% C&D, and 23% other inert. The SF Environment (2019) indicates that a proper system can improve the recycling rate (Zaman, 2022). In the United States, the Environmental Protection Agency (EPA) estimated that in 2018, the country generated 292.4 million tons of municipal solid waste, or 4.9 pounds per person per day (EPA, 2021).

Approximately 36% of all plastics produced are used in packaging, including single-use plastic products for food and beverage containers, and approximately 85% end up in landfills or as unregulated waste. It was estimated that the emissions from plastics in 2015 were equivalent to nearly 1.8 billion metric tons of carbon dioxide (CO2), reaching 17% of the global carbon budget by 2050 (Zheng et al. 2019). These statistics provide insight into the worldwide scale of waste management and highlight the need for effective strategies to reduce waste generation and improve waste management practices.

Solid waste is a well-known and emergent issue, and improper management can lead to substantial and irreversible direct and indirect environmental, economic, and social impacts (Ezeah et al., 2015). Tourists, local residents, and other commercial establishments produce waste daily. This may generate a larger scale of waste for every municipality if appropriate action is not adequately addressed. Improper waste handling may also cause the residents' chronic and other serious health diseases. Moreover, tourist waste frequently varies seasonally and is accumulated in sites vulnerable to littering. This might stress waste management facilities during peak season and harm resources with a remarkably high value. Overall, the cleanliness of tourism destinations is an important parameter to ensure the sector's development (Chaabane, 2019).

Ecological Solid Waste Management Act of 2000

RA 9003 refers to the Republic Act No. 9003, also known as the Ecological Solid Waste Management Act of 2000 in the Philippines. The law aims to provide for an ecological and efficient solid waste management system by establishing segregation, collection, transfer, processing, recycling, and disposal of solid waste in the country. The act also mandates the involvement of local government units, the private sector, and communities in implementing solid waste management practices. This act mandated the Department of Environment and Natural Resources (DENR), Department of Interior and Local Government (DILG), Department of Science and Technology (DOST), Department of Public Works and Highways (DPWH), Department of Health (DOH), Department of Trade and Industry (DTI) and other government agencies to “incorporate ecological solid waste management in the local government units” (RA 9003, 2000). Researchers and LGUs believed that implementing this act improved the practices or policies of several agencies and businesses on the proper segregation, disposal, and recycling of waste throughout the country.

MRFs are facilities where recyclable materials are sorted and processed for reuse, reducing waste going to landfills or open dumpsites. The Act also mandates the closure of open dumpsites and the adoption of environmentally sound solid waste disposal methods, such as sanitary landfills and waste-to-energy facilities. The Ecological Solid Waste Management Act aims to provide a comprehensive approach to solid waste management that encourages sustainable activities, lowers waste, and safeguards the environment and public health. The Act seeks to provide the Filipino people with a cleaner, healthier, and more sustainable environment by providing a framework for ecological solid waste management planning and execution. Through these identified theories and

laws, the five (5) indicators were provided as the basis used in this study. The 5R's of Zero Waste by Johnson (2020), which are refuse, reuse, reduce, recycle, and rot, were utilized in measuring how the respondents rate the waste management practices of a particular tourist attraction.

The 5Rs provided a new scheme for dealing with waste by helping us focus on our habits and consumption patterns (Johnson, 2020). These are the following waste management practices:

Refuse. There are different ways to minimize waste produced by specific individuals. Learning to refuse waste will take some practice, but integrating this step into a business plan is the most efficient way to reduce waste. The first step to a zero-waste lifestyle is to prevent waste from entering your home in the first place. This involves saying "no" to promotional samples, junk mail, single-use disposables such as bags, straws, cups, and cutlery, or any short-lived form of unnecessary items (Johnson, 2020). Saying "no" by refusing unnecessary materials at tourist attractions can lower the impact on landfills. Arney (2019) manifested that the refusal of waste significantly impacts the environment, especially in restoring a clean and liveable environment. Solid wastes have been disposed of properly. Otherwise, they have to be reprocessed immediately so that they would not add to the earth's devastation by being added to a site as a sanitary landfill. Non-biodegradable wastes are mostly hazardous and must be properly disposed of so as not to harm people's health.

According to Circle Waste (2020), simply refusing to use single-use plastics or wasteful, non-recyclable products can ultimately reduce the amount of waste produced daily. Surfrider Foundation (2014) mentioned the reality of plastic pollution in every home, office, school, and community. Plastic creates toxic pollution at just about every stage of its existence, from manufacture to use to disposal. Considering the facts, it is no surprise that it is the most prevalent type of marine litter worldwide.

Reduce. Tourists' waste reduction behaviors performed at tourist destinations are vital to the sustainable development of tourist destinations. How to make tourists engage in such environmentally responsible activities and perform waste reduction behaviors and identify the determinants seem to be one of the critical issues faced by the administrators of tourist destinations (Wang et al., 2021). According to Johnson (2020), reducing not only saves money from expending less but also saves time and becomes more efficient by alleviating physical and mental clutter. Reducing what you do need requires being aware of your purchase choices and being clear about what you need. Waste reduction according to The Nature Conservancy (2022), waste reduction takes much effort which includes purchasing reusable bottles, cups for beverages, using reusable grocery bags, composting, avoiding sing-use containers for beverages, donating used goods or buying second hand items, shopping in local markets and applying paperless transactions in offices and businesses.

Reuse. Reusing materials and goods is another critical part of waste management. By reducing the expense and environmental effects of waste collection, transport, treatment, and

disposal, reuse at the point of generation significantly lowers costs and maximizes ecological benefits. It entails repurposing materials and goods in a manner that is as similar to their original state as possible. Unless materials are recycled, they are not considered waste. EAD (2016) mentioned in its policy statement that reuse includes sorting, cleaning, repairing, refurbishing, and remanufacturing products into new products. For example, beverage bottles are readily reusable after cleaning. Broken furniture can be repaired and resurfaced for reuse. According to the Municipal Ordinance No. 2006-007 of Piñan, Zamboanga del Norte, Art.VIII, Sec. 1, that "reuse of recyclable non-biodegradable materials must be maximized. Sorted cans and plastic containers can be recycled as substitute pots for plants, used tires can be used as playground material or a stacked structure for backyard composting, and soft plastics can manufacture floor wax.

Recycle. According to the study of Singh et al. (2014), the role of recycling in enhancing hotel businesses has contributed to their bottom line. The study uses a waste-audit technique on five hotel properties and conducts cost–benefit analysis based on the waste-audit results. Findings suggest that hotels should practice recycling more rigorously, not only to help the environment but also to realize some potential monetary benefits. Areyna (2020) stated that the recyclability of a material depends on its ability to regain its original properties, and recycling can be an alternative to conventional waste disposal that saves materials and reduces greenhouse gas emissions. Recycling is an alternative to & "traditional waste disposal that can save material and help lower greenhouse gas emissions.

The findings of the study of Premakumara et al. (2013) on their research of Policy Implementation of the Republic Act (RA) 9003 in the Philippines suggested that the impacts of the national mandate can be achieved if the LGUs have the high level of political commitment, development of effective local strategies in collaborative manner, partnership building with other stakeholders, capacity development, adequate financing and incentives, and in the close monitoring and evaluation of performance.

Rot. Johnson (2013) said that rot or transformation of waste from reducing and recycling applies mainly to organic waste coming from food. There are some methods to compost household waste, such as the Bokashi Method garden compost or vermicomposting. Rufus (2015) said that composting transforms rubbish into energy for the plants, thus contributing to a better environment instead of destroying it.

III. Results and Discussion

Tourist Attractions in Terms of Their Classification

From the data gathered, 44% belonged to natural attractions; 21% belonged to cultural/heritage attractions, and the remaining 35% belonged to man-made attractions. From this data set, there are still more natural attractions in the area covered in the study. Ecobnb (2022)

disclosed that nature trips increase attention span, boost creativity, encourage mindfulness, provide a breath of fresh air, and boost Vitamin D in the body. These are just a few benefits of nature tripping aside from the satisfaction you get from the environment that is carefully untouched.

A blogger named Alan from Boston wrote that tourist attractions are busier during weekends. Most families enjoy bonding during weekends, especially if both parents are working during weekdays. Other family members coming from afar visit their relatives and friends during weekends, and touring could be the best way to hasten relationships with friends and family. Others prefer to visit during weekdays, especially those into museums and other historical/heritage sites. The respondents included in this study mostly tour around on weekends.

Most of the related attractions were food vendors. They constitute 50 % of the total number of responses. A few merienda food carts/ souvenir shops were found in tourist attractions, as revealed by the respondents, constituting only 3 % of the total. Water vendors were found in the area, comprising 24 % of the responses. Parking valets were also found in the attractions, constituting 16%, and breakfast food carts were only 4%. This showed that food and water vendors were typically present in local tourist attractions, which satisfied their basic needs as represented in the figure.

Waste Management Practices of the Local Tourist Attractions in terms of Refuse

The overall rating shows that the local tourist attractions refuse to bring in and use plastic and other non-biodegradable materials. The bringing in of plastic bottled water and foods with plastic packaging and plastic containers is not allowed in the tourist attractions. Throwing leftovers is then restricted; instead, they allow giving the leftovers to animals or storing them temporarily for decomposing. These claims were proven by the average weighted values that fall within the range 3.74 to 4.34. On the other hand, less practiced for waste refusal is on littering and throwing of cigarette butts and plastic containers anywhere. These items bear average weighted values ranging from 2.46 to 2.60.

The data suggests that these tourist attractions may have provided proper waste disposal for non-biodegradable waste materials and containers; however, some of the needed practices were not properly observed, and others are also not done religiously. Normalizing the operation of the tourist attractions and observing proper refusal of waste materials are required and have to be implemented and practiced at all times; however, educating the tourists on this takes time and a strong will to implement the policies so that they may become a part of the ordinary processes in the community. Moreover, these refusal practices have not been adequately observed in most places. Thus, local tourists may find it normal not to properly dispose of waste, and this intervention of putting refusal practices into action takes enough time to be ingested by the local tourist. Waste refusal, especially on non-biodegradable materials, lowers the impact of landfills and may correspondingly lower environmental pollution, especially in the affected areas and the populace therein. Arney (2019) manifested that the refusal of waste significantly impacts the

environment, especially in restoring a clean and liveable environment. Solid wastes have to be disposed of properly. Otherwise, they have to be reprocessed immediately so that they would not add to the earth's devastation by being added to a site as a sanitary landfill. Non-biodegradable wastes are mostly hazardous, and they have to be appropriately disposed of so that they do not harm people's health.

The data on "reuse" as a waste management practice among the local tourists. As seen on the table, "reuse" is practiced by local tourists in the locale of the study. This was proven by the mean of 3.43. This shows that local tourists and tourist attractions implement policies on the reuse of materials by encouraging the local tourists to bring their reusable bottles, ecobags, straws, reusable cups, reusable waste materials, and recyclable materials. The practice of "reuse" has been observed by people born before 1980, where "netbags" and baskets, as well as paper wrappers, are still used by vendors in the wet and dry markets to wrap goods. The use of plastic was influenced by foreign culture, whereby convenience was introduced, and people were also used to it until these plastic containers covered the world with devastating effects. The concept of reuse is crucial to lessen the volume of waste by reducing the use of immediately disposable plastics and plastic containers. Reuse refers to the act or practice of using again an item, which does not necessarily mean deviating from its original purpose or to fulfill a different function. Reusing used items helps save time, money, energy, and resources. In broader economic terms, it can make quality products available to people and organizations with limited means, while generating jobs and business activity that contribute to the economy.

According to Rufus (2015), reusing an item is the art of reutilizing it without the treatment process. This helps reduce pollution and waste, thus supporting sustainable processes in an entity's day-to-day activities. The data on "reduce" as a waste management practice for local tourism attractions. It could be seen on the table that implementing zero food waste, using glassware and chinaware, using biodegradable materials, using social media, and restricting tourists from bringing in plastic materials were practiced. At the same time, the restrictions on throwing trash anywhere, using eco-friendly packaged food, separating waste, and keeping grounds tidy at all times were less practiced in the local tourist attractions. Generally, reducing waste was practiced by the local tourist attractions in the locale of the study. This could mean that reducing waste has already been introduced in local tourist attractions; however, putting this waste reduction policy into action takes some time to be inculcated in the minds and actions of local tourists. Waste reduction according to The Nature Conservancy (2022), waste reduction takes much effort which includes purchasing reusable bottles, cups for beverages, using reusable grocery bags, composting, avoiding sing-use containers for beverages, donating used goods or buying second hand items, shopping in local markets and applying paperless transactions in offices and businesses. These actions lead towards reducing the waste that can typically be produced every day. By this, environmental justice can be served as efforts towards reducing environmental impact are made and lead towards ecological sustainability.

Waste Management Practices of the Local Tourist Attractions in terms of Recycling

The sustainable waste management practices of the local tourist attractions involve recycling. Along this line, local tourists are said to practice recycling at tourist attractions. This claim was supported by the mean of 3.40. Recycling has become an activity in local tourism attractions. It has become a part of the normal process when visiting local tourist destinations; however, as to the practices relative to the recycling policy, there may be a few lapses, as things do not get perfect at once. Sustainability of the implementation of recycling as a sustainable waste management practice has to be considered seriously, and it has to be sustained for the longest time among the tourism industries, as it is in these industries where production of waste may be more than usual, as visitors come and go from the attraction**.**

Waste Management Practices of the Local Tourist Attractions in terms of Rot

On waste management practices of local tourist attractions in the context of "rot". Rot means creating a valuable resource from food waste and organics by putrefaction or home composting. This is a way of recycling fruits, vegetables, and yard trimmings into a nutrient-rich soil fertilizer that helps the garden grow while reducing waste to the landfill. In this aspect, the art of "rotting" waste materials was practiced in the local tourist attractions in the locale of the study. This was supported by the mean of 2.92. This shows that almost everything can be composted, aside from plastic and plastic-based materials. The respondents clearly emphasized that they allow fruit peelings, paper boxes, dry leaves, grass, lawn clippings, paper napkins, food scraps, paper cups, plates, and other compostable materials like tea bags and coffee filters.

Composting or "rotting" biodegradable materials is a significant contribution to reducing the impacts of landfills and is suitable for the environment, as composted materials can be used as fertilizer for plants; thus, instead of producing waste, composting produces a better impact on the environment. Rufus (2015) said that composting transforms rubbish into energy for the plants, thus contributing to a better environment instead of destroying it. The hypothetical testing was conducted assuming respondents differed significantly in their " reuse " ratings as a waste management practice. Along this line, the computed H-value was 0.46 with a p-value of 0.795, leading to the null hypothesis's non-rejection. It is then safe to say that there is no significant difference in respondents' ratings on "reuse" as a waste management practice. The p-value denotes a very high probability of acceptance of the null hypothesis, proving that their ratings are almost the same. Recycling is one of the waste management practices that all tourist destinations must apply and practice. Recycling is reusing materials for different purposes.

Regarding recycling, the computed H-value was 1.60, and the p-value was 0.448, which shows no significant difference or variations among the three respondents' perceptions. This goes to show that the hypothesis is not rejected. The p-value of 0.448 shows that there is a 44.80 percent possibility of the acceptance of the null hypothesis. Thus, it is then safe to say that the variation of the responses of the three groups of respondents does not differ at a significant level. The H-value

computed was 0.51, and the p-value was 0.774, leading to the null hypothesis's non-rejection. It is then safe to say that there is no significant variation in the respondents' perceptions of “rot” as a waste management practice. All the respondents observed the practices of the tourists at the same level in the different tourist destinations involved in the study. The p-value of 0.774 shows a very high possibility or probability of acceptance of the null hypothesis; thus, the hypothesis is not rejected.

IV. Conclusion

Visitors are natural attraction lovers who value the natural environment more than cultural and man-made attractions. They are incredibly attracted to the wealth of excellent spots to escape their busy lives. Weekends are busier than weekdays. Therefore, these natural attractions are swarmed by tourists and visitors who want to experience fresh air, beautiful landscapes of nature, and incredible views of the natural environment. Consequently, these visitors, usually families or groups of friends, maximize their visit and stay overnight. Efforts are exerted, such as encouraging visitors to reuse waste and even recycle them, however, due to the influx of visitors, intermittent disposal of non-biodegradable waste was still common. This kind of practice is proper for all who visit the natural attractions. This calls for an intervention such as creating awareness campaigns and implementing waste management practices in local tourist attractions.

V. Recommendations

Improving waste management practices and visitor experiences among local tourist attractions means ensuring that generated wastes are managed effectively and responsibly, eventually enhancing tourists' overall experience. Effective waste management practices can help minimize the negative impact that tourism can have on the environment and local communities, such as pollution and littering. By implementing policies and strategies to manage waste effectively, policymakers can help preserve the area's natural beauty, protect wildlife, and promote sustainable tourism practices. Promoting delightful visitor experiences involves improving tourist amenities and facilities, such as access to clean restrooms, ample seating, and shaded areas. It can also include developing and promoting natural attractions, as visitors prefer these over cultural and man-made attractions. By providing a positive experience for tourists, policymakers can encourage repeat visits, promote positive word-of-mouth advertising, and support local businesses that rely on tourism for revenue. Therefore, improving waste management practices and visitor experiences by and among, local tourist attractions can greatly help to ensure a sustainable tourism industry.

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