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## Research Article

### Practices on Waste Disposal and Its Environmental Effects

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#### ABSTRACT

The study aimed to determine the practices of waste disposal among residents of Barangay Upper Sanraymundo, Jolo, Sulu, Philippines. The researchers sought to answer to the following questions: What is the demographic profile of the resident in terms of educational attainment? What are the practices on waste disposal among the residents? What are the effects on environment of waste disposal practices among the residents? And; is there a significant effect of the waste disposal practices on environment?

Quantitative type of research was utilized specifically the descriptive-predictive research method. The researchers made use of self-structured survey questionnaire based from related literature, related studies and validation of experts. Convenience sampling was used in determining the selected 99 respondents out of 8,308 populations of Upper Sanraymundo Jolo, Sulu, Philippines.

Based on the findings of the gathered data, it was therefore concluded that majority of the respondents are high school graduates. It was also concluded that the majority of the residents always practice waste disposal. The study also found out that the majority of the respondents are aware about the effect of solid waste if not disposed properly. It also concluded that there is a significant effect of solid waste on environment.

Among the findings and conclusions, the highest priority recommendation policies in this study are to strengthen the Republic Act 9003 also known as Ecological Solid Waste Management of 2000 to maintain the necessary policy framework and continue implementing the integrated waste management plan based on 3Rs (reduce, reuse, and recycle) of which the Local Government of Jolo, Sulu, Philippines is strictly complying on the said mandates.

**Keywords:** *Ecological Solid Waste Management, practice waste disposal, Jolo, Sulu, Philippines*

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## **Introduction**

Waste poses a threat to public health and the environment if it is not stored, collected, and disposed properly (Yoda et al, 2022). The world generates 2.01 billion tons of municipal waste annually, with at least 33 percent of that are not managed in an environmentally safe manner. Worldwide, waste generated per person per day averages of 0.74 kilogram but ranges widely from 0.11 to 4.54 kilograms. In the Philippines 14.66 million tons of trash a year, and is the 4<sup>th</sup> largest generator of solid waste among country-members of the association of Southeast Asian Nations (Bagayas, 2020). In Bangsamoro Autonomous Region in Muslim Mindanao (BARMM) the annual waste generation per day is 972.14 tons as of 2016 (World Bank, 2016).

Among all of the problems concerning solid waste, proper waste disposal practice is important for building sustainable, reusing, reducing, and recycling solid waste in order to reduce the number of solid waste that increasing annually. A large portion of waste management practices deal with municipal solid waste which is the bulk of the waste that is created among households, street vendors, and industrial activity (Chavez, 2020). Practices of waste disposal among community can affect the environment either reducing or increasing the solid waste depends on the solid waste management of the people in the community.

Proper waste disposal practices include segregating the waste by applying the 3R's of segregation which are reduce, reuse, and recycle. Reducing waste means decreasing the amount of garbage produced, reusing means utilizing the materials more than once while recycling means creating newly materials from the garbage to make use (Department of Education, 2014). The effective waste disposal practice is other ways to help clean the environment, prevent future disaster risk, and prevent transferring of infectious diseases cause by the solid waste. In waste disposal practices waste segregation is the important process in waste management, it segregates biodegradable and non-biodegradable solid waste (Kochitty, 2020). Improper waste disposal practices are one of the big issues that need to be addressed. Therefore, proper waste disposal

practices and waste management system is very essential to sustain and ensure the cleanliness of the environment and to prevent the possible risk of solid waste. The existing problem that the researchers' chose in the research is the practices of waste disposal which is the method or act of an individual or groups of people disposing or getting rid of unwanted materials or substances. It has a major effect to the environment both negative and positive impact (Sheridan, 2018).

Based on researchers' observations most of the residents in Barangay Upper Sanraymundo dispose the solid waste improperly at the corner of the street mostly during rainy days. This improper waste disposal can affect the barangay itself, the people passing the street, and the other barangay that affected of flowing solid waste. This improper waste disposal can also lead to health risk where decompose and contaminated causing solid waste affect the environment and its surroundings. Other waste disposal practice is the incinerating of solid waste that cause emission of smoke contributing to the known as worldwide global warming as burning leads to air pollution since greenhouse gases have been released. This existing issue that the researchers observe should be managed and prevented since improper practices of solid waste is one of the major problems in the Philippines.

Disposal of solid waste is a widespread problem in both urban and rural areas in many develop and developing countries. Poorly managed waste is contaminating the environment, clogging drainage and cause flooding, transmitting diseases, increasing respiratory problems from burning, harming animals that consume waste unknowingly, and affecting economic development. Increasing volumes of waste are being generated as the global population and living standards rise (Wahba, 2018).

This study benefited the people residing at Barangay Upper Sanraymundo, Jolo, Sulu where the locale of the study conducted. The researchers observed that few applies improper practices of waste disposal like throwing and filing of garbage at the corner of the street but non-the-less were complying with what the local government is imposing the community. This study also benefited nursing

schools, health care practitioners, local government sectors, communities and the school administrators as to how proper waste disposal shall be properly implemented and its effect to environment. This study hopefully will serve as guide to the future researchers, and to the readers.

Awareness in waste disposal practices provides a healthy environment, prevent acquiring different diseases that may cause by the contaminated biodegradable and non-biodegradable solid waste, prevent obstructing the water drainage system that causes flood, and prevent transferring of solid waste from one place to another. In regards to this study, researchers aimed in identifying the practices of waste disposal of residents of the Barangay Upper Sanraymundo Jolo, Sulu, Philippines.

## Methods

This study used Quantitative research specifically descriptive predictive research design. Descriptive-predictive predicts what most likely outcome is after survey of current trends, practices, and conditions that relate to that environmental effect of solid waste disposal practices. Quantitative research utilizes numerical form of data gathering that places into categories. This research design does not allow the respondents to explain their thoughts (Mcleod, 2017).

Descriptive research design was used to discover relationship among variable and allow the prediction of future events from present knowledge (Stangor, 2011). Predictive research design is chiefly concerned with forecasting (predicting) outcomes, consequences, costs, or effects. This type of research design extrapolates from the analysis of existing phenomena, policies, or other entities in order to predict something (Wollman, 2014).

In this study a self-structured questionnaire was used in assessing the practices of waste disposal in which the content was derived from related literature and related studies of the research. This questionnaire composed of three (3) part. Part-I Demographic profile of the respondents. Part-II Practices of Waste Disposal among Residents in Barangay Upper Sanraymundo Jolo, Sulu. Part-III Envi-

ronmental effect of solid waste among the Residents of Barangay Upper Sanraymundo Jolo, Sulu. All gathered information were strictly in confidential. The selected respondents in the study were properly informed of the procedure as to how the researchers will gather data and information from them. Consent was also provided in order to address ethics in research. The respondent has the right to refuse as well.

In the book of Dr. Magna Anissa A. Hayudini (2021) states the sanctity of human life view the sacredness of the human life through a humanistic approach.

The questionnaire determined the practices of waste disposal among the residents of Barangay Upper Sanraymundo Jolo, Sulu. The questionnaire for the environmental effect of solid waste among the residents of Barangay Upper Sanraymundo Jolo, Sulu was answered by the residents in Barangay Upper Sanraymundo Jolo, Sulu by checking YES or NO.

The practices of waste disposal among residents in Barangay Upper Sanraymundo Jolo, Sulu was answered by the respondents using five (5) Likert Scale with (5) interpreted as always, (4) very often, (3) sometimes, (2) rarely, and (1) as never. The respondents answer to each item in the questionnaire was based on their observation and experience.

The internal reliability result based on Cronbach's Alpha was .736 with 22 items questionnaire which indicated that the self-devised questionnaire is reliable.

The research was conducted at Barangay Upper Sanraymundo Jolo, under Sanraymundo Jolo, one of the Barangay of Jolo municipalities in the province of Sulu. The barangay of Upper Sanraymundo has estimated total population of 8,308 based from the Barangay Health Unit in 2019.

The target respondent limited only to the Barangay Upper Sanraymundo Jolo, Sulu with the total population of 8,308 as of 2019. The target respondents of the study composed of 99 respondents residing in the said barangay. The total population of Barangay Upper Sanraymundo was requested from the chairwoman Hja. Amelyn Izquierdo-Tan received by her secretary at the office of the Barangay Sanraymundo Jolo, Sulu.

The study utilized convenience sampling, this types of sampling is a non-probability sampling in which respondents are conveniently located sources of data for researchers. The researchers conducted the questionnaire based on the availability of the respondents (Edgar and Manz, 2017).

The researchers formally sent a letter to Barangay Sanraymundo Jolo, Sulu to inquire the actual population living in the barangay. The total population obtained was sent to the statistician for computation to know the total number of the subject that needed in this research. After obtaining the total respondent the researchers went to the thesis adviser and basing from the collected literature and studies, the researchers formulated a self-structured survey questionnaire to be utilized in collecting data from the respondents.

This self-structured survey questionnaire was submitted to the adviser and researcher, Magna Anissa A. Hayudini, RN, RM, MAN, DPA, LPT for face validity. After such, the same underwent content validity on the hands of three validators namely: Raniza I. Hayudini, RN, MAN; Marhama H. Elias, RN; and Alwenda T. Schuck, RN, MAN (CAR). They were requested to scrutinize every items of the self-structured survey questionnaire and rate it as 1, 2, 3, and 4. A score of 1 (1.00 – 1.49) means not relevant, 2 (1.50 – 2.49) means partially relevant, 3 (2.50 – 3.49) means quite relevant, and 4 (3.50 – 4.00) as highly relevant. The content validity rating (CVR) of the survey questionnaire was found to be 4 for Part II, and 4 for Part III. This means that the self-structured survey questionnaire is highly relevant, valid and ready for reliability test. The suggestions of the three validators were integrated in the new draft. Reliability

test was done on February 17, 2022 at Barangay Upper Sanraymundo Jolo, Sulu with a score of .736 which means highly relevant. This test was participated by the 15 respondents on both occasions. Reliability test result showed that the survey questionnaire was reliable and ready for launching to gather the needed data for the study.

During the data gathering, the researchers explained the purpose of the study to the respondents to ensure cooperation. Data gathering was done during their vacant time and the researchers were present to ask and observe them. The gathered data was presented to the statistician for the analysis and statistical tables to be made together with their interpretation.

## Results and Discussion

This study utilized the frequency and percentage to determine the educational attainment of the residents in Barangay Upper Sanraymundo Jolo, Sulu.

The table 1 below shows that 35 or 35.4 percent were high school graduate, 33 or 33.3 percent where college graduate, 23 or 23.2 percent were elementary graduate and 8 or 8.4 percent falls in no schooling.

This means that majority of the residents of Barangay Upper Sanraymundo were high school graduate in relation of educational attainment to the practice of waste disposal.

With the similarities of a study of Catan, (2021), a total of 332 Grade 12 students from high school participated in the study, shows the respond of senior high school students on their awareness on the possible effect of solid waste if not disposed properly.

*Table 1. Demographic Profile of the Residents in terms of Educational Attainment*

<b>Educational Attainment</b>	<b>Frequency</b>	<b>Percentage</b>
College Graduate	33	33.3%
High School Graduate	35	35.4%
Elementary School	23	23.2%
No Schooling	8	8.1%
Total	99	100%

**Practices of Waste Disposal among the Residents of Barangay Upper Sanraymundo Jolo, Sulu**

This section indicates the practices on waste disposal among the residents of Barangay Upper Sanraymundo Jolo, Sulu.

Table 2 below shows that the mean score for practices on waste disposal among the residents of Barangay Upper Sanraymundo Jolo, Sulu was 4.92. This means that majority of the residents always practice waste disposal.

However, in one study conducted by Furto and Reyes (2014), residents of Barangay City

have moderately implemented the solid waste management practices in their communities. The residents practiced fully the feeling of left over foods to pets. Selling of bottles, plastics, cans and other scraps to junkshops; avoiding the use of toxic and hazardous materials and chemicals; collection of garbage by municipal trucks; reuse of reusable materials; segregation of biodegradable from non-biodegradable wastes and acquisition of sanitary landfill are practiced to a moderate level.

Table 2. Practices of Waste Disposal among the Residents of Barangay Upper Sanraymundo Jolo, Sulu

	Number of Respondents	Mean	Textual Equivalent	Interpretation
Practices on waste disposal	99	4.92	Always	The respondents always practice waste disposal.

**Effects on Environment of Waste Disposal Practices among the Residents of Barangay Upper Sanraymundo Jolo, Sulu**

This section indicates the frequency and percentage of effects on environment of waste disposal practices among the residents of Barangay Upper San Raymundo Jolo, Sulu.

The table 3 below shows that 96 or 97% of the respondents answered “yes” that they are aware about the effect of solid waste if not disposed properly. This was followed by they are aware the throwing of facemask elsewhere causes transferring of the disease with 95 or 96 percent of yes and 93 or 93.9 percent answered yes that there is an incinerating garbage in their area. These are the top 3 (three) effects on environment of waste disposal practices among residents of Barangay Upper Sanraymundo Jolo, Sulu.

In the study of Paghasian (2017), people in the community in Mindanao State University – Maigo School of Arts and Trades are completely aware on their responsibilities because the residents are knowledgeable on the importance of solid waste management. More so, Lad, Chauhan and Gole (2020), the result indicates that individuals are knowledgeable on their responsibilities following rules and regulations as what their local government applied for the

success of the solid waste management program.

With regards to nursing ethics according to Aming-Hayudini (2021), whenever you perform actions that conform with the law, it is good. It guides you not only to become citizens who abide by certain rules but develop as to become moral individuals. The knowledge of the different aspects of laws will enable us to become moral individuals. The knowledge of the different aspects of laws will enable us to become more careful in these norms to help us fulfill our duty to preserve human life.

A recent study kampf et al. (2020), found that human coronaviruses can remain active on inanimate hard surfaces (such as metal, glass, or cloth) for up to nine days. Although some Asians countries still do not follow proper management strategies and insufficient solid waste containers is one of the major problems that lead to the contamination of infectious waste in solid waste containers in the general community, the threat will be greater in developing countries that do not have sufficient knowledge on solid waste management.

Oppelt (2013), disposal of large quantities of municipal waste has become a serious problem in many U.S. cities because of inadequate landfill space. There is an increasing trend toward using incineration as an alternative

means of solving the problem of waste management. Incinerator emissions are complex, depending on the composition of waste, design of incinerators

*Table 3. Effects on Environment of Waste Disposal Practices among the Residents of Barangay Upper Sanraymundo Jolo, Sulu*

Effects on Environment of Waste Disposal Practices among Residents of Barangay Upper Sanraymundo Jolo, Sulu.	Frequency of Yes	Percentage of Yes	Frequency of No	Percentage of No
1. I am aware about the effect of solid waste if not disposed properly.	96	97%	3	3.0%
2. I understand the importance of waste segregation.	88	88.9%	11	11.1%
3. I am aware that incinerating solid waste affects the environment.	76	76.8%	23	23.2%
4. I am aware that throwing of facemask elsewhere cause transferring of the disease.	95	96%	4	4%
5. I am aware that solid waste can be a breeding ground of the mosquitoes.	93	93.9%	6	6.1%
6. There is incinerating garbage in our area.	84	84.8%	15	15.2%
7. There is a pile of garbage that cause stink odor in our barangay.	76	76.8%	23	23.2%
8. There is stagnant water full of garbage in our barangay.	83	83.8%	16	16.2%
9. There is a clogging of water drainage when raining.	92	92.9%	7	7.1%

### ***Significant Effect of Solid Waste among Residents of Barangay Upper Sanraymundo Jolo, Sulu***

This section includes the result of simple linear regression of 99 respondents with alpha of 0.05 and P-value of .000. The result shows that the alpha value is greater than the P-value which means that the hypothesis was rejected. There was significant effect of solid waste among residents of Barangay Upper Sanraymundo Jolo, Sulu.

Similar to the study of Lammas (2020), disposing of solid waste has huge environmental

effects that cause serious problems. Climate change is one of the major environmental effect that caused by the solid waste when disposed improperly. The main gases responsible for the greenhouse effect include carbon dioxide, methane, nitrous oxide, water vapor, and fluorinated gases and most of these gases are the result of solid waste. Irresponsible waste disposal can cause many different environmental problems such as air, water, and land pollution and could also cause numerous different health conditions.

Table 4. Significant Effect of Solid Waste among Residents of Barangay Upper Sanraymundo Jolo, Sulu

	Number of Respondents	Alpha	P-Value	H <sub>0</sub>
Regression	99	0.05	.000	Rejected

## Conclusion

Based on the findings of the gathered data, it was therefore concluded that majority of the respondents are high school graduate. It was also concluded that the majority of the residents always practice waste disposal. The study also found out that majority of the respondents are aware about the effect of solid waste if not disposed properly, followed by they are aware the throwing of facemask elsewhere causes transferring of the disease if not disposed properly, and lastly followed by there is an incinerating of garbage in the area of Barangay Upper Sanraymundo Jolo, Sulu. It also concluded that there is a significant effect of solid waste among residents of Barangay Upper Sanraymundo Jolo, Sulu therefore null hypothesis was rejected.

In the study of Dr. Magna Anissa A. Hayudini (2018) entitled *Preventive Health Care Measures and Health Promotion Implemented by Public Health Officials in Mainland Sulu*. Retrieved from: <https://ijhss.net/index.php/ijhss/article/view/466>, mentioned that health promotions by public health officials in mainland Sulu, Philippines covers the aspects of health education as such environmental sanitations are performed in a regular basis.

Based on the findings and conclusions of the study, the following are recommended:

### Policies

1. Strengthen the Republic Act 9003 also known as Ecological Solid Waste Management should maintain the necessary policy framework and continue implementing the integrated waste management plan based on 3Rs (reduce, reuse, and recycling).
2. Strengthen the P.D. 825 also known as the Penalty for Improper disposal of Garbage/ others forms of uncleanliness should strengthen and continuously maintain the rules and regulations and observe for
3. Strengthen the PD 856 also known as Code on Sanitation of the Philippines

### Program Actions

1. The local government unit must strictly monitor the proper waste management by giving penalty to those disposing waste improperly.
2. The barangay officials should maintain the rules and policies regarding waste disposal.
3. The Barangay Health Unit should maintain and increase the awareness of the residents of barangay Sanraymundo, Jolo, Sulu by providing health education or health teaching on proper waste disposal.

### Research Agenda

1. A study on the improper waste disposal on the residents of Barangay Upper Sanraymundo Jolo, Sulu.
2. A further study on the environmental effect of solid waste in the street of Barangay Upper Sanraymundo Jolo, Sulu.
3. Further research about the environmental effect of incinerating solid waste in Barangay Upper Sanraymundo Jolo, Sulu.

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