



# Awareness and Compliance of the Students, Faculty, and, Staff of Kalinga State University on the Solid Waste Management Program

Cherry Ann D. Bona, Melanie S. Manuel

Tabuk City, Kalinga, Philippines

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**Abstract**— This study looks into the awareness and compliance of the students, faculty, and staff of Kalinga State University on the Solid Waste Management Program. The level of awareness and extent of compliance of the respondents with the provisions of the solid waste management program along the segregation, 3Rs (reduce, reuse, recycle), and disposal was looked into. The relationship between the awareness and compliance of the respondents with the provisions of the solid waste management program was also identified. A total of three hundred sixty-seven (367) respondents participated in the study and was participated by the faculty, staff and students who finished their Environmental Science. Result shows that the majority of the respondents were students. The study revealed that solid waste management program were not really practiced and observed by the respondents. Respondents are somewhat aware of the provision of solid waste management according to segregation or separation and the 3Rs (reduce, reuse, recycle) including disposal. Based on the results, it is recommended to have a mass implementation of the program since results show that the respondents are partially aware and never comply with the provisions of the solid waste management program according to disposal. Follow-up evaluation on awareness and compliance of the respondents should be done to detect decay in retention and performance. Disseminate concepts/techniques of segregation, recycling, and composting to the respondents. Information dissemination campaign to proper storage and pilling of waste at their house as well as to their environment. Increase public awareness of the negative impacts of solid waste management. Coordinate with adjacent barangays to be able to establish a common materials recovery facility.

**Keywords**— awareness and compliance, reduce, reuse, recycle, Solid Waste Management.

## I. INTRODUCTION

### BACKGROUND OF THE STUDY

Management of waste is a vital issue to ensure the protection of the people through the maintenance of a safe environment. Global concern about solid waste management as an important fact of environmental hygiene needs to be integrated with total environmental planning. Waste disposal, therefore, is everybody's concern at the barangay, municipal, provincial, and national levels.

Many awareness-raising activities are going on presently with the need for Solid Waste Management practices and support recycling in the Philippines, still there exists a lack of awareness about the importance of Solid Waste Management. This is one of the reasons why there is a lack of motivation for young people towards helping with segregation, proper waste disposal, and recycling. Waste disposal is thus a major issue confronting local government units. It has become a high priority due to the health and environmental risks associated with waste. Waste likely contains pathogens, which commonly cause infections.

Garbage piles, besides being foul and unsightly, are breeding grounds for vermin and insects, which carry human diseases.

Improperly discarded waste can contaminate sources of drinking water, they can be carried by rivers to the sea and adversely affect fisheries, tourism, and the health of coastal communities. Solid waste disposal is proving to be a complex and controversial issue- with local government units facing limited options for addressing this concern.

Landfills are being promoted as alternative means of disposal, but finding landfill sites has been difficult due to economic constraints, public health concerns, and social acceptability issues. There is a need, therefore, for other solid waste management and pollution control strategies that credence waste released to the environment. The government has recognized the severity of the garbage problem and has given priority to establishing appropriate measures to address it. The most comprehensive piece of legislation dealing with this problem is Reth public Act (RA) 9003, knas tas the Ecological Solid Waste Management Act of 2000. It assigns the primary task of implementation and enforcement to Local Government Units. It emphasizes the importance of minimizing waste using techniques such as recycling, resource recovery, reuse ,and composting.

Republic Act 9003 is an act providing for an Ecological Solid Waste Management Program, creating the necessary institutional mechanisms and incentives, declaring certain acts prohibited and providing penalties, appropriating funds, therefore, and for other purposes better known as the Ecological Solid Waste Management Act of 2000 that provides a systematic, comprehensive, and ecological solid waste management program in the country to ensure the proper segregation, collection, transport, storage, treatment and disposal of solid waste through the formulation and adaptation of the best environmental practice in ecological waste management excluding incineration. This is one of the problems of every place in the PhilippineEveryery Higher Education (HE's) they have their oay of handling theiritse to lessen this problem.

Proper waste management is important, and the assessment of solid waste management can help in evaluating the effectiveness of the Local Government Solid Waste Management Plan in promoting and ensuring environmental practice on waste management.

The majority of the time, students' careless trash disposal in schools verges on indiscipline and presents health and environmental dangers. Wastes are an unavoidable byproduct of any human settlement and the activities that go along with it.

The researchers were motivated to perform the study since Tabuk City's higher education institutions have a problem with on-campus garbage management.

## II. CONCEPTUAL/THEORETICAL FRAMEWORK

"I am a rubber and you are a glue, what comes out of you bounces off me and stitches on you" This familiar saying applies to all individuals. What is to be done now is what will be reaped soon. As garbage is disposed of improperly, the future generation will experience environmental problems and issues. Therefore to have a better and healthier place to live in, must take good care of our environment. This study zeroed in to the awareness and extent of compliance of the faculty, staff and students of Kalinga State University. It also tried to look into the among the provisions of Solid Waste Management has the highest level of awareness and compliance among the respondents.

### OBJECTIVES OF THE STUDY

This study aims to determine the level of awareness and extent of compliance of students, faculty, and staff of Kalinga State University's solid waste management program.

Specifically, it sought to answer the following questions:

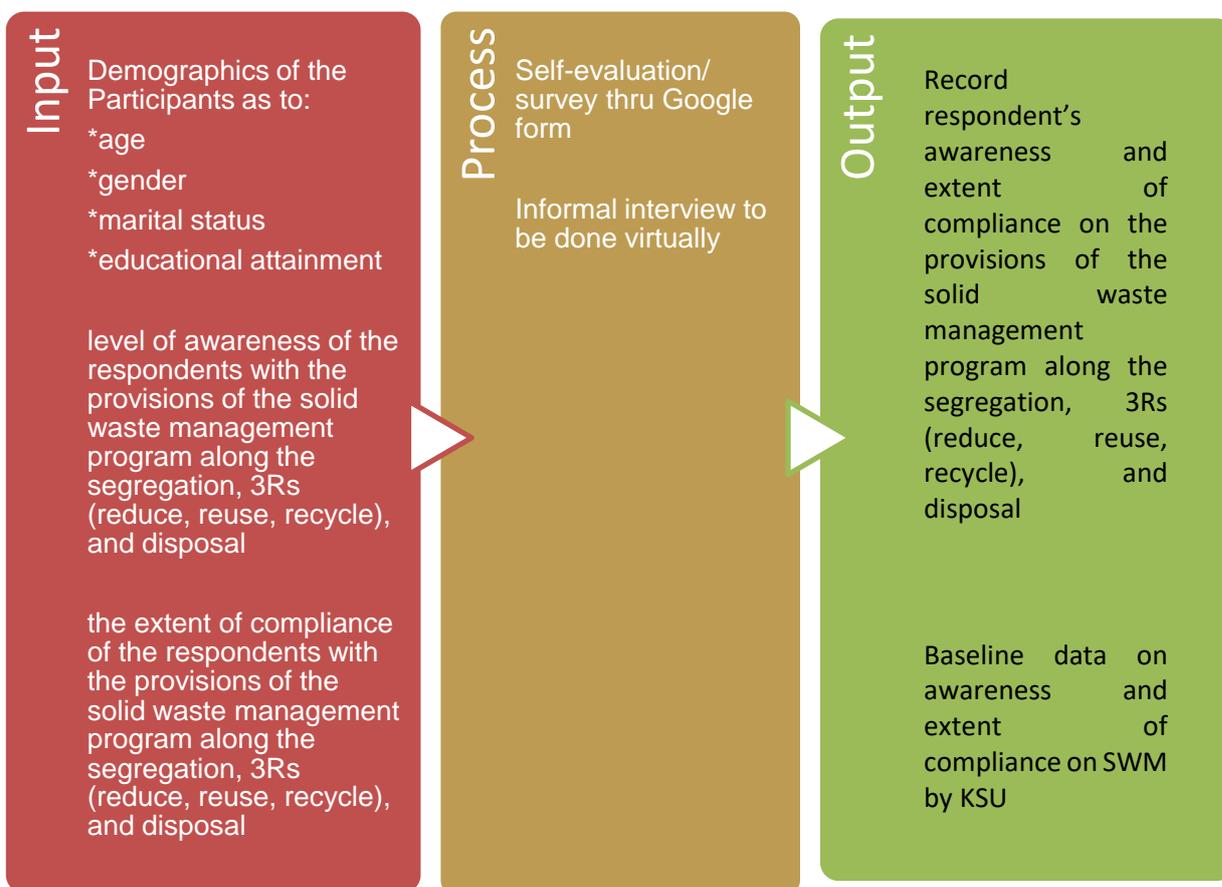
1. What is the profile of the respondents in terms of age, gender, civil status, and educational attainment?
2. What is the level of awareness of the respondents with the provisions of the solid waste management program along the segregation, 3Rs (reduce, reuse, recycle), and disposal?
3. What is the extent of compliance of the respondents with the provisions of the solid waste management program along the segregation, 3Rs (reduce, reuse, recycle), and disposal?
4. Which among the provisions of Solid Waste Management has the highest level of awareness and compliance among the respondents?

### SIGNIFICANCE OF THE STUDY

The government has started the War on Waste initiative to raise awareness among all citizens about the risks that wastes represent to human health, the potential sources of waste, and the correct disposal of waste.

Their perspectives and attempts to address the problems with solid waste management will gain focus and purpose due to the findings of this study, which will broaden their horizons.

To Society and the community, this research will help them to emphasize the significance of safe waste disposal;



### SCOPE AND DELIMITATION

This study was conducted to determine the level of awareness and extent of compliance of students, faculty, and staff of Kaliga State University on the provisions of the solid waste management program according to segregation, 3Rs (reduce, reuse, recycle), and disposal. This study involved students who were enrolled in Environmental Science and Science, Technology and Society courses. conducted fro March 2022 to December 2022.

### III. REVIEW OF RELATED LITERATURE

#### Legal Bases

Republic Act No. 9003 or the “Ecological Solid Waste Management Act”

Provides the legal framework for the country’s systematic, comprehensive and ecological solid waste management program that shall ensure the protection of public health and the environment. It underscores, among other things, the

need to create the necessary institutional mechanisms and incentives, as well as imposes penalties for acts in violation of any of its provisions. The implementing rules and regulations of R.A No. 9003 are contained in DENR Administrative Order No. 2001-34. (Eleventh Congress, Third Regular Session July 2000).

Section 12 of R.A 9003 City and Municipal Solid Waste Management Board.

Each City or municipality shall form a City or Municipal Waste Management Board that shall prepare, submit and implement a plan for the safe and sanitary management of solid waste generated in areas under its geographic and political coverage. (Eleventh Congress, Third Regular Session July 2000).

Section 25 of R.A 9003. Guidelines for Transfer Stations.

Transfer stations shall be designed and operated for efficient waste handling capacity and in compliance with environmental standards and guidelines set under this act and other regulations. Provided, that no waste shall be stored in such station beyond twenty-four (24) hours. The

siting of the transfer station shall consider the land use plan, proximity to the collection area, and accessibility of haul routes to the disposal of the facility. The design shall give primary consideration to size and space sufficiency in order to accommodate the waste for storage and vehicles for loading and unloading waste. (Eleventh Congress, Third Regular Session July 2000).

Article 2 Segregation of Waste Section 22 of R.A 9003 Mandatory Segregation of Solid Wastes

The LGUs shall evaluate alternative roles for the public and private sectors in providing collection services, type of collection system, or combination of systems, that best meet their needs: Provided, that segregation of waste shall primarily be conducted at the source, including household, institutional, industrial, commercial and agricultural sources. ( Eleventh Congress, Third Regular Session July 2000)

Article 4 Recycling Program Section 26 of R.A 9003 Inventory of Existing Markets for Recyclable Materials.

The DTI shall within six months from the effect of this act and in cooperation with the Department, the DILG, and, other concerned agencies and sectors, publish a study of existing markets for processing and purchasing recyclable materials and the potential steps necessary to expand these markets. Such study shall include, but not be limited to, an inventory of existing markets for recyclable materials, product standards for recyclable and recycled materials, and a proposal, developed in conjunction with appropriate agencies, to stimulate the demand for the production of products containing post-consumer recovered materials shall refer to the discharge, deposit, dumping, spilling, leaking or placing of any solid waste into or in a lan (Eleventh Congress, Third Regular Session July 2000)

**Concepts of Solid Waste Management**

Science fiction writer Arthur C. Clarke noted that “solid waste are only raw materials were too stupid to use”.

In a technical note, the term solid waste is used to include all non-liquid wastes generated by human activity and a range of solid waste materials resulting from the disaster, such as general domestic garbage such as food waste, ash, and packaging materials: human feces disposed of in garbage: emergency waste such as plastic water bottles and packaging from other emergency supplies; rubble resulting from the disaster; mud and slurry deposited by the natural disaster; and Allen trees and rocks obstructing transport and communications. Other specialist wastes, such as medical waste from hospitals and toxic waste from industry, will also need to be dealt with urgently, but they are not covered by this technical note (World Health Organization), 2011).

Solid waste presents a serious problem because most of the methods used to dispose of this trash are environmentally damaging. ( Santiago, Dorado et. Al 1996).

According to Chiras D.D (1992), waste management is designed for scientists, engineers, and managers, regardless of their discipline, who are involved in scientific, technical, and other issues related to solid waste management. Emphasis is placed on integrated approaches. These approaches require the blending of technical and non-technical factor Although the dissemination and application of innovative technical information is extremely important, the implementation of sustainable waste management practices also requires a thorough understanding of the pertinent legal, social, economic, and regulatory issues involved.

Eric O. Torres said that the biggest challenge to growing LGUs is to come up with solid waste and pollution control strategies that would effectively reduce the rubbish released to the environment. Unfortunately, this challenge cannot be effectively addressed by each LGU alone. LGUs need to combine their technical and engineering expertise, and their regulatory and enforcement powers with public education, awareness, and involvement campaigns to be able to properly implement solid waste and pollution control programs. Finally, a good solid waste and pollution control strategy will not be an effective one until it is fully implemented, accepted, and institutionalized by the people and institutions. As noted by several local chief executives with exemplary solid waste programs, their strategies were not about good engineering and slogans but rather strong political will in implementing what is good for the environment and the people. ([www.bayawancity.gov.ph](http://www.bayawancity.gov.ph)).

The Environmental Protection Agency has determined a three-tiered approach for managing solid waste. Each of these should be practiced to reduce the amount of material headed for final disposal. They in order of importance: REDUCE, the best way to manage solid waste. Don't create waste in the first place! Buy only what you need. Use all that you buy. Avoid heavily packaged products. Avoid disposable items like paper plates and plastic silverware. Buy the largest size package for those items that you are often. REUSE is the better way to manage solid waste. Reuse items and use them over and over until they are completely worn out. RECYCLE, is a good way to manage solid waste. Recycling means taking something old and making it into something new. In Seminole County, all residents who live in a single-family homes can recycle right in front of their houses. Those residents who live in apartments or condominiums can drop off their recyclables at several different locations. Old newspapers, #1 and #2 plastic bottles, green, clear, and brown glass bottles and jars,

and aluminum and steel cans can all be recycled at the curb. Simply rinse out containers and remove lids. That's it: its very simple and very worthwhile. Not only does it keep items out of landfill, but recycling also conserves natural resources (Seminole Country Government, 2012).

Australia may be a large country, but we live in a throw-away society that is rapidly filling it with our waste. Our insatiable desire to constantly upgrade disposable technology and consume over-packaged products has continued unabated for decades. At the same time, however, there has been a trend away from both burning waste in incinerators and burying it in landfills. Waste management policies now seek to minimize waste disposal by reducing its generation and by reusing and recycling. This book reveals the extent of our growing waste problem and examines the waste and recycling practices of households, and includes many tips on how to reduce, reuse and recycle. Topics include green waste, plastics, glass, paper, metal, and electronic waste (Healy,2010).

There are many stringent regulations governing the treatment and disposal of waste in the UK, both onshore and offshore, and in most other countries as well. Facilities involved in waste transfer and treatment require licenses, and all personnel who work at such facilities require the proper kind of training that goes with the handling of waste which can be often dangerous if not handled properly. Waste management facilities also need to be able to respond quickly to emergency situations. By their very nature there is rarely any warning that an emergency is about to occur. For that reason emergency response teams need to be on standby every hour of every day, and everyday of every year. Waste management disposal and treatment can originate from both domestic and industrial sources (Rose, 2009).

### **Solid Waste Management Solutions:**

#### **Waste Segregation/Separation**

According to Santiago, Dorado et . al (1996), waste separation means segregating between wet and dry and inorganic waste at the source level.

Frederika Rentoy, Quezon City's Environment Protection, and Waste Management Division chief said, "Waste segregation is the mother program because the idea of waste segregation is not just waste segregation per se. The idea behind this is to really minimize or reduce the volume of garbage. We are dumping at our landfills but then at the same time, we still want people to learn how to manage their own garbage." (The Philippine Star by Rhodina Villanueva December 2012).

Waste can be segregated as Biodegradable and Non-biodegradable.

Biodegradable waste- including organic waste, e.g. kitchen waste, vegetables, fruits, flowers, leaves from the garden, and paper.

Non-biodegradable waste- can be further segregated into:

- a) Recyclable waste- plastics, paper, glass, metal, etc.
- b) Toxic waste- old medicines, paints, chemicals, bulbs,, spray cans, fertilizer and pesticide containers, batteries, and shoe polish.
- c) Soiled- hospital waste such as cloth soiled with blood and other body fluids.

Toxic and soiled waste must be disposed of with utmost care.

(<http://edugreen.teri.res.in/explore/solwaste/segre.htm>)

Segregation of waste is indispensable to optimizing waste reduction and lightening the load on landfills as many components of domestic waste can be recycled. This lies at the heart of sustainability and resource management as recycling counterbalances excessive consumption of natural resources by reintroducing the finite materials into use. (By Gulf News May 16, 2014).

#### **Reduce.**

According to Sheryl Eisenberg "reduce" means using fewer resources in the first place. This is the most effective of the three R's and the place to begin. It is also, I think, the hardest because it requires letting go of some very American notions, including: the bigger the better, new trumps old and convenience is next to godliness. (<http://www.mixitproductions.com>)

Santiago, Dorado et.al (1996) reducing the amount of garbage is the first step in easing the waste disposal problem. This may mean any of these practical activities: use both sides of a sheet of paper, purchase whenever possible products in large containers, tape over used videos, resole shoes instead of buying new ones, bring or used shopping bags and refuse to accept new ones, leave behind the box that contained the shoe, avoid using disposables such as diapers, plastics, cups, paper plates and paper napkins.

According to Department of Environmental Protection, the best way to discover where you can reduce waste is to actually sort through your trash. What does each family member throw away? What material take up the most space? Is anything reusable or repairable? Can you reduce the amount of disposable products you use? Can you substitute products and packaging made of reusable, recyclable, or nonhazardous materials? If you are throwing away unusable leftover products, can you give them to someone else, or buy these things in smaller sizes ([recyclepa@state.pa.us](mailto:recyclepa@state.pa.us))

## Reuse

Before you recycle or dispose of anything, consider whether it has life left in it. A jam jar can store leftovers. Food scraps can become compost. An old shirt can become a pajama top. An opened envelop can become a shopping list. A magazine can be shared .DVDs can be traded. A dishwasher can be repaired.A computer can be upgraded.A car can be resold. A cell phone can be donated. Returnable bottles can be , well.. returned ( S.Eisenberg, <http://www.mixiproductions.com>)

Santiago, Dorado et al (1996) in their study, most plastics and glass products

- Are reusable. Make sure you don't break your soft drink or beer bottle. Not only you recover your deposit. You help save energy. Glass making is a highly intensive energy process because high temperatures are necessary to mold glass. At home, we must set side the plastic containers..Sauce markers buy these from the junks, take note of your new house-hold batteries. Do not throw them right away. Normally these batteries , even ordinary batteries-especially those used at high energy consumer gadgets like flashlights, toys, and tape recorders, can be recharged once or twice. Usually, only the exciting charge is used up, but not its full potential. A cheap battery charger can do the trick.

To reuse is to use an item again after it has been used. This includes conventional reuse where the item is used again for the same function, and new-life reuse where it is used for a different function. In contrast, recycling is the breaking down of the used item into raw materials which are used to make new items. By taking useful products and exchanging them, without reprocessing, reuse help save time, money, energy, and resources. In broader economic terms, reuse offers quality products to people and organizations with limited means, while generating jobs and business activity that contribute to the economy. (<http://en.wikipedia.org/wiki/Reuse>)

## Recycling

According to Miller and Levine (1991), in the process of recycling, certain kinds of solid wastes-newspaper, bottles and metals or plastic cans for example can be processed and used again. Recycling can make a big difference if enough people participate.

Eisenberg S. in his study, recycling is the "R" that has caught on the best. Partly, this is because there are so many curbside recycling programs today (8,660 as of 2006, according to the EPA), which makes recycling so darned easy. What keeps it from being a total piece of cake is the rules. Every municipality has its own, and they are not

always as straight forward as they could be. (<http://www.mixiproductions.com>)

Recycling means using something again. Newspapers can be used to make new newspapers. Aluminum cans can be used to make new aluminum cans. Glass jars can be used to make new glass jars. Recycling often saves energy and natural resources. Natural resources are things of value provided by the earth. Natural resources include land, plants, minerals, and water. By using materials more than once, we conserve natural resources. It almost always takes less energy to make a product from recycled materials than once, we conserve natural resources. It almost always takes less energy to make a product from recycled materials than it does to make it from new materials. Using recycled aluminum scrap to make new aluminum cans, for example, uses 95% less energy than making aluminum cans from bauxite ore, the raw material used to make aluminum. In the case of paper, recycling saves trees and water. Making a ton of paper from recycled paper saves up to 17 trees and uses 50% less water ([http://www.eia.gov/kids/energy.cfm?page=environment\\_r recycling-basics](http://www.eia.gov/kids/energy.cfm?page=environment_r recycling-basics))

Communities should attempt to recycle as much trash as possible, but they must also realize that recycling alone cannot solve the growing waste problem. (Santiago, Dorado 1996)

## Disposal

Waste from our homes is generally collected by our local authorities through regular waste collection, or by special collections for recycling. Within hot climates such as that of the Caribbean, the waste should be collected at least twice a week to control fly breeding and the harbouring of other pests in the community. Other factors to consider when deciding on the frequency of the collection are the odors caused by decomposition and the accumulated quantities. Descriptions of the main types of collection systems are given in the table below.

(Sourced from <http://web.mit.edu/urbanupgrading/upgrading/issues-tools/issues/waste-collection.html#AnchorCollection-45656>)

## IV. DEFINITION OF TERMS

**Solid Waste**-refers to any material that is solid and is of no use like residues, garbage and trash.

**Waste Management**- refers to the systematic administration of activities which provide for the source of separation, storage, collection, transfer, processing, recycling, disposal reduction and re-use of solid wastes.

**Ecological Solid Waste Management-** refers to the systematic administration of activities that provide for segregation at source, segregated transportation, storage, transfer, processing, treatment, and disposal of solid waste and all other waste management activities which do not harm the environment.

**Segregation-** refers to a solid waste management practice of separating different materials found in solid waste in order to promote the recycling and reuse of resources and to reduce the volume of waste for collection disposal.

**Re-use-** refers to the process of recovering materials intended for the same or different purpose without the alteration of physical and chemical characteristics.

**Recycling-** refers to the treating of used or waste materials through a process of making them suitable for beneficial use and for other purposes, and, includes any process by which solid waste materials are transformed into new products in such a manner that the original products may lose their identity, and which may be used as raw materials for the production of other goods or services.

## V. METHODOLOGY

### LOCALE OF THE STUDY

All information needed to answer the objectives was conducted solely at Kalinga State University for the period of the academic year 2022- 2023. The faculty, staff, and students was asked to answer the prepared questionnaire during their vacant time to minimize the disturbance of classes.

### RESEARCH DESIGN

Descriptive- Correlation design was used in the study. It describes the solid waste management profile in terms of age, gender, civil status, and educational attainment.

It also describes the degree of awareness and extent of compliance to which the respondents perform the three provisions on solid waste management. It determines to what provisions of the solid waste management program the respondents are aware of and comply.

### RESPONDENTS OF THE STUDY

The respondents of the study are the faculty, staff, and students of Kalinga State University. All vacant Faculty and staff during the conduct of the study was included in the study. Students were pre-selected based from their finished courses and must include the Environmental Science course and the Science, Technology and Society subject.

### INSTRUMENTATION

A survey questionnaire created through Google Form was used to meet the objectives of the study. The questionnaire was developed and tested from the research study of Gwen Manuel, 2011. The questionnaire consists of two parts: Personal profile( age, gender, civil status, and educational attainment), and thirty (30) provisions on solid waste management program in terms of segregation, 3Rs (reduce, reuse, recycle), and disposal. The content and validity were established for the tool.

### DATA GATHERING PROCEDURE

The researchers wrote a letter to the school requesting permission to perform the study. The updated and modified questionnaire was utilized to collect the study's data. The data were gathered from March to December 2022. After permission was sought from the different deans and head of office, the questionnaires were given to the respondents. An online copy was also made available for the convenience of the respondents in answering and to avoid prolong interaction.

### Data Analysis

Results was tallied and tabulated. Percentage, mean, and frequency was used as statistical methods. For Percentage:  $P = \frac{nf}{nx} 100\%$  where: P-percentage F-frequency(number of respondents of a particular criteria) n-total number of respondents. For weighted mean:  $M = \frac{\sum fx}{n}$  where:  $\sum$ =summation f-frequency x-weighted mean n- total number of population. The following ratings were used in the interpretation of the study:

Arbitrary Scale	Adjectival Equivalents	
	Degree of Awareness	Extent of Compliance
4 - 3.26-4.00	- AWARE	- GREAT EXTENT
3 - 2.51-3.25	- PARTIALLY AWARE	- SOME EXTENT
2 - 1.76-2.50	- SOMEWHAT AWARE	- LITTLE EXTENT
1 - 1-1.75	- NOT AWARE	- NEVER

Percentage and other descriptive measures like count, standard deviation, and weighted mean were computed to be able to meaningfully describe the profile of the respondents.

## VI. RESULTS AND DISCUSSION

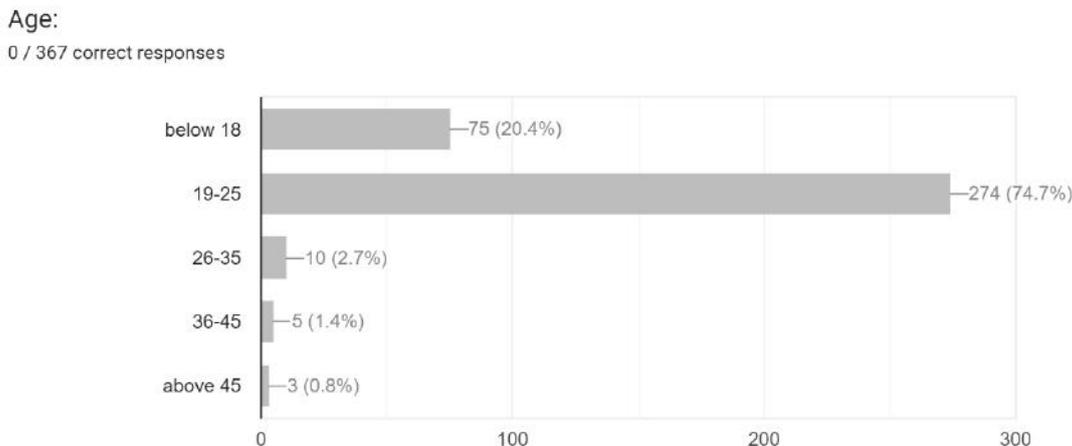


Fig.1. Distribution of respondents according to age

Figure 1 shows that majority of the respondents belong to age bracket 19-25 with equivalent percentage of 74.7 % followed by age bracket below 18 with equivalent of 20.4% followed by age bracket 26-35 with equivalent of 2.7% followed by 36-45 with equivalent of 1.4 % and least belong to the age bracket of 45 with the percentage of 0.8 %.

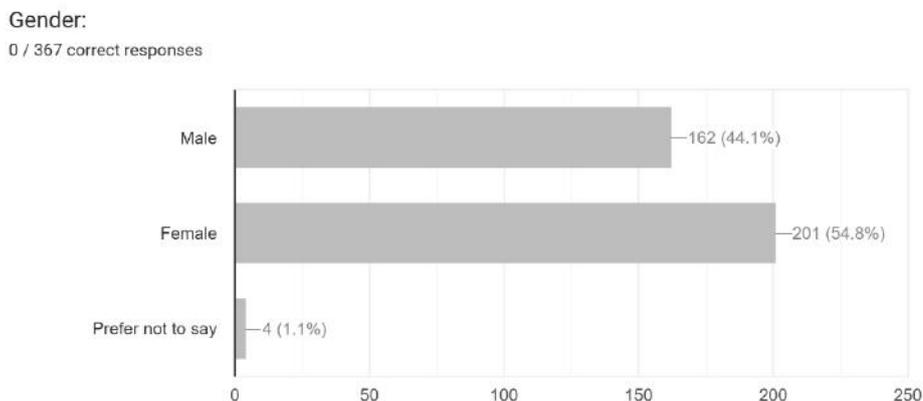


Fig.2. Distribution of respondents according to gender.

Figure 2 shows that majority of the respondents belong to the female group with frequency of 201 and equivalent percentage of 54.8% followed by male group with a frequency of 162 and equivalent percentage of 44.1 % and the least group prefer not to say with a frequency of 4 equivalent to 1.1%.

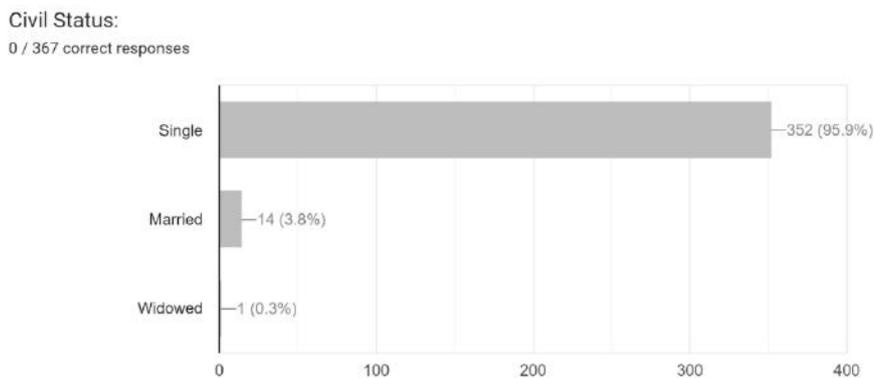


Fig.3. Distribution of respondents according to civil status.

Table 3 shows that majority of the respondents are single with frequency of 352 and equivalent percentage of 95.9% followed by married with a frequency of 14 with equivalent percentage of 3.8% while only 1 is widowed with 0.3%.

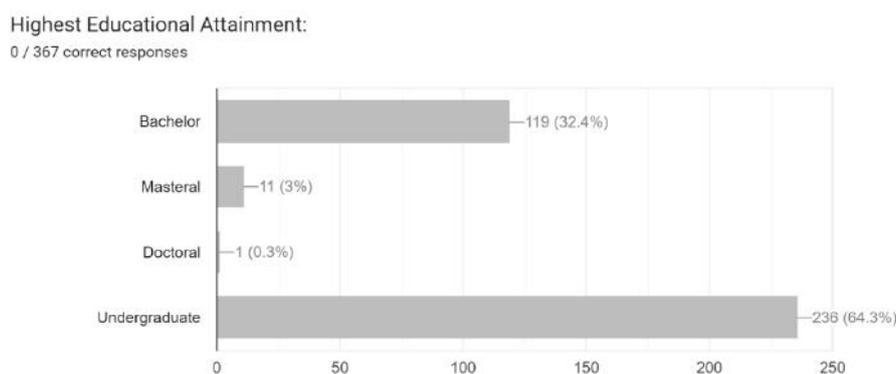


Fig.4. Distribution of respondents according to educational attainment.

Figure 4 shows that majority of the respondents belong to undergraduate with frequency of 236 , equivalent percentage of 64.3%, followed by a bachelor with frequency of 119, equivalent to 32.4% followed by masteral with frequency of 11, equivalent to 3% and only1 doctoral with a percentage of 0.3 %.

Table 1. Level of awareness of respondents in the provision of solid waste management programs according to segregation/separation.

Solid Waste Management Program Provision: (Segregation/Separation)	Degree of Awareness	
	Mean	Descriptive Value
Segregate solid waste into biodegradable and non-biodegradable (nabubulok at di- nabubulok)	2.63	Partially aware
Segregate recyclable from non-recyclable wastes.	2.17	Somewhat Aware
Segregates compostable from noncompostable.	1.90	Somewhat Aware
Segregate biodegradable or compostable wastes in a place where they are generated.	1.67	Not Aware
Segregate nonbiodegradables in a place where they are generated.	1.73	Not Aware

Separate biodegradable wastes in four enclosed containers for recovery.	1.50	Not Aware
Separate non-biodegradable in four enclosed containers for recovery	1.40	Not Aware
Segregate recyclable wastes before collection	2.03	Somewhat Aware
Sort metal and plastic containers as substitute pots for plants.	1.97	Somewhat Aware
Separate and keep safe hazardous waste material such as broken fluorescent lamps and bottles.	3.00	Partially Aware
<b>OVERALL</b>	<b>2.00</b>	<b>Somewhat aware</b>

Table 1 shows that respondents are somewhat aware of the provision of solid waste management according to segregation or separation. The majority of the respondents are somewhat aware of segregating recyclable from non-recyclable wastes, compostable from non-compostable, and recyclable wastes before collection, metal, and plastic containers.

Some respondents are not aware of segregating biodegradable and non-biodegradable in a place where they are generated and separating biodegradable wastes and non-biodegradable wastes in three enclosed containers for recovery.

Table 2. Level of awareness of respondents in the provision of Solid Waste Management Program according to 3Rs (Reduce, Reuse, Recycling)

Solid Waste Management Program Provision: 3Rs (Reduce, Reuse, Recycling)	Degree of Awareness	
	Mean	Descriptive Value
Minimize the use of non-biodegradable materials	1.93	Somewhat aware
Minimize the use of biodegradable food liners, wrappers, and containers.	1.73	Somewhat aware
Collected recyclables separately and bring to recycling centers or junk dealers.	2.80	Partially Aware
Feed animals with food scraps	2.50	Somewhat aware
Dry fruit peelings and use as an insect repellent	1.27	Not Aware
Used tires for playground material or stocked structures for backyard composting.	2.03	Somewhat aware
Recycle residuals of solid wastes after resource recovery from future use.	1.83	Somewhat aware
Reuse bayong and other containing bags during the marketing	2.97	Partially Aware
Convert organic material such as grass, leaves, food waste, woody material, and manure into a soil-like material	2.57	Partially Aware
Use animal waste (feces, urine, soiled wipes, pads) as organic gardening.	1.60	Not Aware
<b>OVERALL</b>	<b>2.123</b>	<b>Somewhat aware</b>

Table 2 shows that respondents are somewhat aware of the provisions of solid waste management according to the 3Rs (reduce, reuse and, recycle). The majority of the respondents are somewhat aware of minimizing the use of non-biodegradable materials, biodegradable food liners, wrappers, and containers, feeding animals with food scraps, using tires for playground material or stocked structures for backyard composting and recycling residuals of solid wastes after resource recovery from future use.

Some respondents are partially aware of collecting recyclables separately and bring to recycling centers or junk dealers, reusing bayong and other containing bags during the marketing, and converting organic material such as grass, leaves, food waste, woody material, and manure into a soil-like material.

Least respondents with a mean of 1.27 are not aware on drying fruit peelings and use as insect repellent, using animal waste and human waste (feces, urine,soiled wipes,pads, diapers) in organic gardening.

Table 3. Level of awareness of respondents in the provision of Solid Waste Management Program according to Disposal.

Solid Waste Management Program Provision: (Disposal)	Degree of Awareness	
	Mean	Descriptive Value
Store biodegradable or compostable wastes in places where they are generated.	3.20	Partially Aware
Store nonbiodegradable in the place where they are generated.	2.85	Partially aware
Place food waste in covered cans or pails.	3.00	Partially aware
Place garden and human wastes in sacks, cans, and bags	1.50	Not aware
Place non-compostable wastes in either sacks, bags, or boxes	2.82	Partially aware
Store toxic and hazardous wastes in a sealed bag/container prior to collection	1.53	Not aware
Dispose of residuals of solid waste after resource recovery from future use.	3.23	Partially aware
Bring out solid wastes in front of the house gate/door or along the collection route during the collection period.	1.70	Not aware
Avoid open burning of firewood materials .e. g. (twigs, branches, leaves, husks)	3.24	Partially aware
Avoid open burning of firewood materials .e. g. (twigs, branches, leaves, husks)	3.20	Partially aware
<b>OVERALL</b>	<b>2.627</b>	<b>Partially aware</b>

Table 3 shows that the respondents are partially aware of the provisions of solid waste management according to disposal. The majority of the respondents are partially aware of storing biodegradable and non-biodegradable in places where they are generated, placing food wastes in covered cans or pails and non-compostable wastes in either sacks, bags or boxes, disposing residuals of solid waste after resource recovery from future use and

avoiding open burning and open -dumping of firewood materials (e.g. twigs, branches, leaves, husks).

The rest of the respondents are not aware of placing garden and human wastes in sacks, cans, and bags, storing toxic and hazardous wastes in sealed bags/containers prior to collection and bringing out solid wastes in front of houses gates/doors or along collection route during the collection period.

Table 4. Extent of compliance of respondents in the provision of solid waste management program according to segregation/separation.

Solid Waste Management Program Provision: (Segregation/Separation)	Extent of Compliance	
	Mean	Descriptive Value
Segregate solid waste into biodegradable and non-biodegradable (nabubulok at di- nabubulok)	2.77	Some Extent
Segregate recyclable from non-recyclable wastes.	2.07	Little Extent
Segregates compostable from non-compostable.	1.93	Little Extent
Segregate biodegradable or compostable wastes in a place where they are generated.	1.43	Never
Segregate nonbiodegradables in a place where they are generated.	1.43	Never
Separate biodegradable wastes in four enclosed containers for recovery.	1.20	Never
Separate non-biodegradable wastes in four enclosed containers for recovery.	1.10	Never
Segregate recyclable wastes before collection	2.00	Little Extent
Sort metal and plastic containers as substitute pots for plants.	1.87	Little Extent
Separate and keep safe hazardous waste material such as broken fluorescent lamps and bottles.	2.10	Little Extent
<b>OVERALL</b>	<b>1.79</b>	<b>Little Extent</b>

Table 4 shows that respondents comply to a little extent in the compliance on the provision of solid waste management according to segregation/separation. The majority of the respondents comtowith little extent in the following; segregate recyclable from non-recyclable wastes, compostable from non-compostable, recyclable wastes before collection, metal, and plastic containers, and hazardous waste material such as broken fluorescent lamps and bottles.

Some respondents never comply with the following; segregate biodegradable or compostable wastes and non-biodegradable in a place where they are generated and separate biodegradable wastes and non-biodegradable wastes in four enclosed containers for recovery.

Least respondents comply to some extent with segregating solid waste into biodegradable and non-biodegradable (nabubulok at di nabubulok

Table 5. Extent of compliance of respondents in the provision of the Solid Waste Management Program according to the 3Rs (Reduce, Reuse, Recycling)

Solid Waste Management Program Provision: 3Rs (Reduce, Reuse, Recycling)	Degree of Awareness	
	Mean	Descriptive Value
Minimize the use of non-biodegradable materials	1.50	Never
Minimize the use of biodegradable food liners, wrappers, and containers.	1.67	Never
Collected recyclables separately and bring to recycling centers or junk dealers.	2.73	Some Extent
Feed animals with food scraps	2.00	Little Extent
Dry fruit peelings and use as insect repellent	1.10	Never
Used tires tires for playground material or stocked structure for backyard composting.	1.83	Little Extent
Recycle residuals of solid wastes after resource recovery from future use.	1.73	Never
Reuse bayong and other containing bags during the marketing	2.30	Little Extent
Convert organic material such as grass, leaves, food waste, woody material, and manure into a soil-like material	2.23	Little Extent
Use animal waste (feces, urine, soiled wipes, pads) as organic gardening.	1.53	Never
<b>OVERALL</b>	<b>1.862</b>	<b>Little Extent</b>

Table 5 shows that respondents comply with the little extent in the compliance on the provision of solid waste management according to 3Rs the ( reduce, reuse and recycle). The majority of the respondents never comply with the following; minimize the use of non-biodegradable materials, biodegradable food liners, wrappers and containers, dry fruit peelings and use as an insect repellent, recycle residuals of solid wastes after resource recovery from future use and use animal waste, human waste (feces, urine, soiled wipes, pads, diapers) as organic gardening.

Some respondents comply to a little extent on the following; feeding animals with food scraps using tires or playground material or stockstructuresre for backyard composting, reusing bayong and other containing bags during the marketing and converting organic material such as grass, leaves, food waste, woody material and manure into a soil-like material.

Table 6. Extent of compliance of respondents in the provision of Solid Waste Management Program according to Disposal.

Solid Waste Management Program Provision: (Disposal)	Degree of Awareness	
	Mean	Descriptive Value
Store biodegradable or compostable wastes in places where they are generated.	1.40	Never
Store nonbiodegradable in the place where they are generated.	1.37	Never
Place food waste in covered cans or pails.	1.33	Never

Place garden and human wastes in sacks, cans, and bags	1.90	Little Extent
Place non-compostable wastes in either sacks, bags, or boxes	1.73	Never
Store toxic and hazardous wastes in a sealed bag/container prior to collection	1.97	Little Extent
Dispose of residuals of solid waste after resource recovery from future use.	1.67	Never
Bring out solid wastes in front of the house gate/door or along the collection route during the collection period.	2.46	Little Extent
Avoid open burning of firewood materials .e. g. (twigs, branches, leaves, husks)	1.37	Never
Avoid open dumping of firewood materials e. g. (twigs, branches, leaves, husks)	1.43	Never
<b>OVERALL</b>	<b>1.663</b>	<b>Never</b>

Table 6 shows that respondents never comply in the compliance on the provision of solid waste management according to disposal. The majority of the respondents never comply with the following: store biodegradable or compostable and non-biodegradable wastes in places where they are generated, place food wastes in covered cans or pails and non-compostable wastes in either sacks, bags, or boxes, dispose of residuals of solid waste after resource recovery from future use and avoid open burning and open dumping of firewood materials e.g. (twigs, branches, leaves, husks).

The rest of the respondents comply to a little extent on the following; place garden and human wastes in sacks, cans, and bags, store toxic and hazardous wastes in sealed bags/bagstainer prior to collection and bring out solid wastes in front other of house gate/door or along collection route during the collection period.

## VII. SUMMARY

This study investigates the awareness and compliance of the students, faculty, and staff of Kalinga State University on the Solid Waste Management Program. The faculty, staff, and students were asked to answer the prepared questionnaire adapted and revised from the research study of Gwen Manuel, 2011. 367 respondents participated in the study. Students who finished their Environmental Science and STS subjects were asked to answer the questionnaire. According to age, majority of the respondents belong to age bracket 19-25 with equivalent percentage of 74.7 % followed by age bracket below 18 with the equivalent of 20.4% followed by the age bracket 26-35 with an equivalent of 2.7% followed by 36-45 with the equivalent of 1.4 % and least belong to the age bracket of 45 with the percentage of 0.8 %. As to gender, the majority of the respondents belong to the female group with a frequency of 201 and an equivalent percentage of 54.8% followed by the male group with a frequency of 162 and an equivalent percentage of 44.1 % and the least group prefers

not to say with a frequency of 4 equivalent to 1.1%. As to civil status, the majority of the respondents are single with frequency of 352 and an equivalent percentage of 95.9% followed by married with a frequency of 14 with the equivalent percentage of 3.8% while only 1 is widowed with 0.3%. And as to educational attainment majority of the respondents belong to undergraduate with a frequency of 236 , equivalent percentage of 64.3%, followed by a bachelor with a frequency of 119, equivalent to 32.4% followed by masteral with a frequency of 11, equivalent to 3%, and only 1 doctoral with a percentage of 0.3 %.

Based on the results, awareness, and compliance with the provisions of the solid waste management program were not really practiced and observed by the respondents. In the level of awareness, respondents are somewhat aware of the provision of solid waste management according to segregation or separation and the 3Rs (reduce, reuse, recycle). But respondents are not aware of the provisions of solid waste management according to disposal.

## VIII. CONCLUSION

As a result of conducting this research, awareness, and compliance with the provisions of the solid waste management program were not really practiced and observed by the respondents. In the level of awareness, respondents are somewhat aware of the provision of solid waste management according to segregation or separation and the 3Rs (reduce, reuse, recycle). But respondents are not aware of the provisions of solid waste management according to disposal.

## IX. RECOMMENDATION

Solid Waste Management is a long-term process. A lot of activities are involved in the program. After obtaining data from the study, the researcher would recommend the following:

- ✓ Mass implementation of the program since results show that the respondents are partially aware and never comply with the provisions of the solid waste management program according to disposal.
- ✓ Follow-up evaluation on awareness and compliance of the respondents should be done to detect decay in retention and performance.
- ✓ Disseminate concepts/techniques of segregation, recycling, and composting to the respondents.
- ✓ Information dissemination campaign to proper storage and pilling of waste at their house as well as to their environment.
- ✓ Increase public awareness of the negative impacts of solid waste management. Coordinate with adjacent barangays to be able to establish a common materials recovery facility.

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## 12. APPENDIX

### The Questionnaire

#### PART I. Personal Profile

Name: \_\_\_\_\_ (optional)

Age: \_\_\_\_\_

Gender: \_\_\_\_\_

Civil Status: \_\_\_\_\_

Educational Attainment: \_\_\_\_\_

Part II. Please indicate your degree of awareness and extent of compliance on the items indicated. Kindly put a check (✓) in the box.

Use the scale below:

- | Awareness          | Compliance       |
|--------------------|------------------|
| 1. Not Aware       | 1. Never         |
| 2. Somewhat Aware  | 2. Little Extent |
| 3. Partially Aware | 3. Some Extent   |
| 4. Aware           | 4. Great Extent  |

Solid Waste Management Program Provision: (Segregation/ Separation)	Degree of Awareness				Extent of Compliance			
	1	2	3	4	1	2	3	4
Segregate solid waste into biodegradable and non-biodegradable (nabubulok at di-nabubulok)								
Segregate recyclable from non-recyclable wastes.								
Segregates compostable from noncompostable.								

Segregate biodegradable or compostable wastes in place where they are generated.									
Segregate nonbiodegradables in a place where they are generated.									
Separate biodegradable wastes in four enclosed containers for recovery.									
Segregate recyclable wastes before collection									
Sort metal and plastic containers as substitute pots for plants.									
Separate and keep safe hazardous waste material such as broken fluorescent lamps and bottles.									
3Rs (Reduce, Reuse, Recycle)	Degree of Awareness				Extent of Compliance				
	1	2	3	4	1	2	3	4	
Minimize the use of non-biodegradable materials									
Minimize the use of biodegradable food liners, wrappers, and containers.									
Collected recyclables separately and bring to recycling centers or junk dealers.									
Feed animals with food scraps									
Dry fruit peelings and use as insect repellent									
Used tires for playground material or stocked structure for backyard composting.									
Recycle residuals of solid wastes after resource recovery from future use.									
Reuse bayong and other containing bags during marketing									
Convert organic material such as grass, leaves, food waste, woody material and manure into soil-like material									
Use animal waste (feces, urine, soiled wipes, pads) as organic gardening.									
(Disposal)	Degree of Awareness				Extent of Compliance				
	1	2	3	4	1	2	3	4	
Store biodegradable or compostable wastes in places where they are generated.									
Store nonbiodegradable in the place where they are generated.									
Place food waste in covered cans or pails.									
Place garden and human wastes in sacks, cans, and bags									

Place non-compostable wastes in either sacks, bags or boxes								
Store toxic and hazardous wastes in a sealed bag/container prior for collection								
Dispose of residuals of solid waste after resource recovery from future use.								
Bring out solid wastes in front of the house gate/door or along the collection route during the collection period.								
Avoid open burning of firewood materials .e. g. (twigs, branches, leaves, husks)								
Avoid open dumping of firewood materials e. g. (twigs, branches, leaves , husks)								