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ENVIRONMENTAL MANAGEMENT PROGRAM OF THE KALINGA - APAYAO STATE COLLEGE, TABUK CITY, KALINGA: AN INPUT TO A WASTE MANAGEMENT GUIDE

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Abstract: *Waste management may be defined as the discipline associated with controlling the generation, storage, collection, transfer and transport, processing, and disposal of solid waste in a manner that is in accordance with the best principles of health, economics, engineering, conservation, aesthetics, and other environmental considerations, and that is also responsive to public attitudes. This study aimed to make an objective assessment on the status of the Environmental Management Program of the Kalinga - Apayao State College. Specifically, it endeavored to describe the extent of implementation of the activities identified in the Code, the level of awareness of the stakeholders on the activities of the program, and to propose a waste management guide that can be used by the State College to enhance the implementation of the program. Descriptive statistics were used to analyze the research data. Triangulation from a variety of sources like interview, observations and analysis of documents were also used to validate the data collected.*

Findings of this study revealed that The Environmental Management Program of the Kalinga - Apayao State College is moderately implemented with a total weighted mean of 2.0.The Stakeholders involved in the study which includes the students, faculty and staffs are moderately aware on the provisions of the Environmental Management Program of the College, and likewise a Waste Management Guide was proposed by the respondents to be used by the State College.

KEYWORDS: *Environmental Management, Waste Management Studies, Higher Education Institution*

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BACKGROUND

Waste management is a major challenge in urban areas throughout the world. Without an effective and efficient waste management program, the waste generated from various human activities, both industrial and domestic, can result in health hazards and can have a negative impact on the environment. Understanding the waste generated, the availability of resources, and the environmental conditions of a particular society are important to developing an appropriate waste management system. Waste management may be defined as the discipline associated with controlling the generation, storage, collection, transfer and transport, processing, and disposal of solid waste in a manner that is in accordance with the best principles of health, economics, engineering, conservation, aesthetics, and other environmental considerations, and that is also responsive to public attitudes. In its scope, solid-waste management includes all administrative, financial, legal, planning, and engineering functions involved in the solutions to all problems of solid waste. The solutions may involve complex interdisciplinary fields such as political science, city and regional planning, geography, economics, public health, sociology, demography, communications, and conservation, as well engineering and materials science. For instance, if waste is wet or has a low heating value, it would not be possible to incinerate it without adding supplemental fuel. If a portion of the waste stream consists of organics and can be easily separated from other waste materials, bioconversion of the waste may become a viable strategy. On the other hand, the waste generated by industrialized countries may be different from those generated by non-industrialized countries. Non-industrialized societies may have more organic waste than those generated by industrialized countries. If this is the case, composting or anaerobic digestion may be more suitable for organic waste management. The activities associated with managing solid waste from the generation point to final disposal normally include generation, reduction, reuse, recycling, handling, collection, transfer and transport, transformation (e.g., recovery and treatment), and disposal. Depending on site- specific conditions, a sound waste-management program can be established by combining some of the necessary activities into integrated waste management. On the other hand, legislative efforts and effective implementation are vital for the safe management and disposal of waste. Incentives may be provided for the

development and practice of safe treatments, harmless manufacturing processes, and methods for converting solid waste into valuable resources by recycling and reuse.

All society is fundamentally responsible for solid waste management services. Its responsibility lies in determining how services would be provided, who should provide the services and under what conditions these services take place. In the end, the overall success of the program will substantially depend on the national government support, public and private sector involvement.

The academe just like the Kalinga - Apayao State College plays an important role in helping the government attain quality environment. Faced with the fact that the youth make up majority of the nation's population, greater is the need to immerse these junior members of the society in an intensive waste management practices in schools. Schools are basins where people are molded, the training ground through which to instill necessary attitudes and mindsets that would serve as the core towards proper living in a demanding world. Thus, a partnership between and among children and adults, individuals who make up the school community, should be strengthened to work on the road to a cleaner and better place conducive to promoting the best learning experience.

Management of waste requires a comprehensive plan. It will take the right combination of options to meet each community's needs. These options include waste reduction, recycling and composting, incineration, and land filling. Hence, this study was designed.

THEORETICAL/ CONCEPTUAL FRAMEWORK

Quality environment is a quest of every Filipino citizen. The Philippine government drew up a decree to further the environmental cause. On July 24, 2000 the Philippine Congress enacted RA 9003 or the Ecological Solid Waste Management Act. This Act provides for an ecological solid waste management program, creating the necessary institutional mechanisms and incentives, declaring certain acts prohibited and providing penalties, appropriating funds thereof, and for other purposes." This Act mandated the Department of Education (DepEd), the Technical Education and Skills Development Authority (TESDA), the Commission on Higher Education (CHED), the Department of Environment and Natural Resources(DENR), and other concerned government agencies to "incorporate ecological solid waste management in the school system at all levels" (RA 9003, 2000). This trend towards enlisting educational institutions had been taken up by private organizations after

the National Solid Waste Management Commission (NSWMC) established a comprehensive approach in "Mainstreaming Ecological Solid Waste Management in the Philippine Educational System Project."

Through the implementation of the DENR, the project sought to enhance the capacity of students' waste management through an Ecological Solid Waste Management Training Program. Due to this Act, Waste management has become one of the most urgent and visible environmental priorities of urbanized areas that needs a concerted approach with the active participation of all sectors including schools.

Why a Waste Management (WM) module specifically for schools?

Although the basic principles are common, different settings often require different WM systems. What are the peculiar characteristics of a school which point to certain features that would be different for, e.g. a wet market or a commercial center?

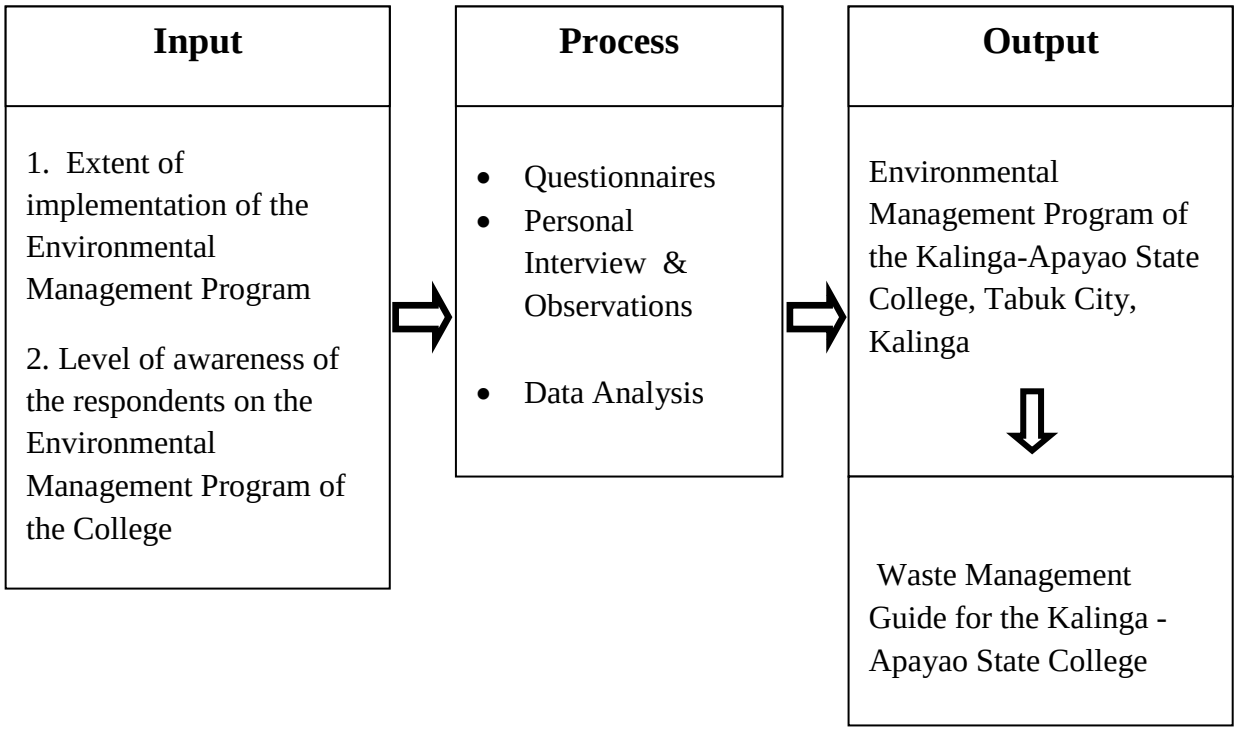
1. Schools, by nature, serve as the most ideal models for correct / proper behavior and attitude development, and are composed of many young people who are impressionable and idealistic.
2. The students are on campus most of the day and theories learned in the classroom can be reinforced by rules and guidelines for behavior.
3. They are let out all together or in big segments at recess time, eating their snacks after playing.
4. There are certain nodes of waste concentration, e.g., paper in classrooms and offices, soiled tissue, soft drink cans, and disposable cups in the canteen, tin cans, and peelings in the kitchen.
5. In all-female schools, feminine napkins make up a big portion of the total waste.

There are many differences too. Some campuses are large, some are extremely limited in space. The organizational structures vary. The curriculum levels from pre-school to college have different age clientele, However, diverse as the conditions of schools may be, it can be presumed that schools are cradles of values formation. One concrete way by which students should develop the value of caring for the Earth is to ensure that they are taught the right attitude and behavior towards the waste they generate.

Recognizing the role that schools play in the attainment of a quality environment, the Kalinga - Apayao State College drafted its own Environmental Management Code which was approved by BOT Res. No. 784, s. 2010. Its vision is to conserve life, property and natural resources. The Kalinga - Apayao State College shall be the front liner in promoting a clean and healthy environment. It motivates and actualizes the faculty, staff and students for the sustainable conservation and management of environmental resources. The provisions of this code were the basis of the items written in the questionnaire.

Through this, we hope that the younger members of our society would learn to understand the value of reducing and managing the wastes being generated at schools, and eventually, carry on such good habit into the respective homes and communities. Each sector of the society is a part which makes up a whole, and a call for a collective effort is demanded.

Framework of the study



OBJECTIVES OF THE STUDY

1. To determine the extent of implementation of the Environmental Management Program of the Kalinga - Apayao State College.
2. To determine the level of awareness of the respondents on the Environmental Management Program of the college.
3. To propose a waste management guide for the Kalinga - Apayao State College

METHODOLOGY

The Kalinga - Apayao State College was selected as the study area. The study made used of the descriptive research method with the survey questionnaire as the main data gathering tool. The solicited information was evaluated, tabulated and computed using appropriate descriptive statistics. The three point likert Scale was used to give meanings to the findings. Various related information were gathered through internet and library research to support the data collected from the study.

Range	Qualitative Interpretation
2.34 - 3.0	Much implemented/ much aware
1.67 - 2.33	Moderately implemented/ aware
1.00 - 1.66	Less implemented/ aware

POPULATION OF THE STUDY

The respondents of the study were the students and faculty members of the different Institutes of KASC and the administrative staff who were chosen by random sampling. A total of 190 completed questionnaires were retrieved back. From the 190 respondents, 125 were students from the different institutes of the college, 40 faculty and 25 administrative staff.

Table 1 Shows the Population of the Study

Stakeholder	Number	Rank
Students	125	1
Faculty	40	2
Administrative Staff	25	3
Total	**190**	

DATA COLLECTION AND ANALYSIS

Descriptive Statistics was used to analyze the research data. The data collected were carefully tabulated, organized, analyzed and interpreted using the weighted mean to describe the extent of implementation of the different identified activities of the program and the level of awareness of the respondents on these activities. To interpret the data, arbitrary categories were used following the three point Likert Scale.

RESULTS AND DISCUSSIONS

The results of study are presented and discussed below :

Table 2 displays the Extent of Implementation of the Environmental Management Program of KASC (N= 190)

ACTIVITIES	Wtd. Mean	Description
1. Proper reduction and segregation of solid waste	2.14	moderate
2. Non-usage of throw away materials such as straws, Styrofoam, plastics etc. within the school campus	1.52	less
3. Waste receptacles are properly labeled for proper waste disposal and on-site collection	2.44	much
4. Strict implementation of the No spitting and No littering Policy	1.44	less
5. Practice of the bring home your garbage policy	2.18	moderate
6. Recycling of materials	2.20	moderate
7. Each unit in the state college is given an area to maintain	2.58	much
8. Cutting of trees and removal of plants within the campus is prohibited without permission from the EMCC	2.70	much
9. Burning and dumping of waste in areas other than the designated places within the campus is prohibited	2.06	moderate
10. Use of pesticides, chemicals, commercial feeds and fertilizers within the premises of the college is strictly prohibited	2.54	much
11. The use of air conditions, refrigerators and the like must be limited	2.11	moderate
12. Urinating elsewhere other than designated areas within the state college premises is strictly prohibited	2.14	moderate
13. Annual water testing is conducted	2.52	much
14. Annual tree planting activities for the students, faculty and staff of the college is conducted	2.45	much
15. Astray animals within the school premises is strictly prohibited	1.75	moderate
16. Promotion on the use of fuel free ride within the school campus	1.25	less
17. Strict implementation of the KASC-SSC Resolution No. 8 on the No Smoking Policy	2.12	moderate
18. Information dissemination on the Environmental Management Code of the College is done every start and end of the semester	1.10	less
19. The College maintains a composting facility and storage facility for recyclables	1.64	less
20. The EMC Committee will evaluate every end of the month the compliance of each unit to the guidelines of this code	1.21	less
TAWM	**2.00**	**moderate**

The respondents opined that there is a moderate implementation of the Environmental Management Program of the College as shown by the total average weighted mean of 2.00. Remarkably, 6 activities were deemed to be much implemented, namely; Waste receptacles are properly labeled for proper waste disposal and on-site collection (2.44), Each unit in the state college is given an area to maintain (2.58), Cutting of trees and removal of plants within the campus is prohibited without permission from the EMCC (2.70), Use of pesticides, chemicals, commercial feeds and fertilizers within the premises of the college is strictly prohibited (2.54), annual water testing is conducted (2.52), and annual tree planting activities for the students, faculty and staff of the college is conducted (2.45).

However, six activities were also rated to be less implemented activities of the program. These include Non-usage of throw away materials such as straws, Styrofoam, plastics etc. within the school campus (1.52), Strict implementation of the No spitting and No littering Policy (1.44), Promotion on the use of fuel free ride within the school campus (1.25), Information dissemination on the Environmental Management Code of the College is done every start and end of the semester (1.10), The College maintains a composting facility and storage facility for recyclables (1.64) , and The EMC Committee will evaluate every end of the month the compliance of each unit to the guidelines of this code (1.21). The other activities were deemed to be moderately implemented.

The results suggest that although the institution has already initiated the important steps in Environmental Management as shown by the organization of the EMC Committee and the approval of the Environmental Management Code by the Board of Trustees, tangible projects have not yet been fully implemented. This can be due to the lack of policy development and implementing rules and regulations of the code.

Table 3 presents the Level of Awareness on the Environmental Management Program of KASC (N= 190)

ACTIVITIES	Weighted Mean	Description
1. Proper reduction and segregation of solid waste	2.10	moderate
2. Non-usage of throw away materials such as straws, Styrofoam, plastics etc. within the school campus	2.22	moderate
3. Waste receptacles are properly labeled for proper waste disposal and on-site collection	2.15	moderate
4. Strict implementation of the No spitting	2.34	much

and No littering Policy		
5. Practice of the bring home your garbage policy	1.65	less
6. Recycling of materials	1.45	less
7. Each unit in the state college is given an area to maintain	2.58	much
8. Cutting of trees and removal of plants within the campus is prohibited without permission from the EMCC	2.62	much
9. Burning and dumping of waste in areas other than the designated places within the campus is prohibited	1.86	moderate
10. Use of pesticides, chemicals, commercial feeds and fertilizers within the premises of the college is strictly prohibited	2.35	much
11. The use of air conditions, refrigerators and the like must be limited	1.55	less
12. Urinating elsewhere other than designated areas within the state college premises is strictly prohibited	2.11	moderate
13. Annual water testing is conducted	2.57	much
14. Annual tree planting activities for the students, faculty and staff of the college is conducted	2.65	much
15. Astray animals within the school premises is strictly prohibited	1.75	moderate
16. Promotion on the use of fuel free ride within the school campus	1.20	less
17. Strict implementation of the KASC-SSC Resolution No. 8 on the No Smoking Policy	2.10	moderate
18. Information dissemination on the Environmental Management Code of the College is done every start and end of the semester	1.52	less
19. The College maintains a composting facility and storage facility for recyclables	1.61	less
20. The EMC Committee will evaluate every end of the month the compliance of each unit to the guidelines of this code	1.15	less
TAWM	1.98	moderate

The table shows that the respondents are moderately aware on the Environmental Management Program of the College as shown by the total average weighted mean of 1.98. The table also revealed that the respondents are much aware on the Strict implementation of the No spitting and No littering Policy with a mean of 2.34, Each unit in the state college is

given an area to maintain with a mean of 2.58, Cutting of trees and removal of plants within the campus is prohibited without permission from the EMCC with a mean of 2.62; Use of pesticides, chemicals, commercial feeds and fertilizers within the premises of the college is strictly prohibited with a mean of 2.35; Annual water testing is conducted with a mean of 2.57; and annual tree planting activities for the students, faculty and staff of the college is conducted with a mean of 2.65. This tree planting activity got the highest mean due to the fact that the respondents themselves are involved.

From the 20 activities stated lifted from the Environmental Code, the respondents revealed that they are less aware on seven given activities of the program, namely; Practice of the bring home your garbage policy; Recycling of materials; the use of air conditions, refrigerators and the like must be limited; Promotion on the use of fuel free ride within the school campus; Information dissemination on the Environmental Management Code of the College is done every start and end of the semester; The College maintains a composting facility and storage facility for recyclables; and the EMC Committee will evaluate every end of the month the compliance of each unit to the guidelines of this code. The other 7 activities were rated as moderately aware.

The findings are not surprising because there was no information dissemination conducted since the approval of the Environmental Management Code. Most of the respondents are not even aware on the presence of this program.

Guidelines for a Waste Management Program

1. Start with the end in mind.

Conceptualize your WM program from generation to segregation to collection to final disposal to minimize frustration. The scheme will be based on your objectives.

A. Suggested Objectives:

1. the most basic objective is to have a clean surrounding.

A most basic objective, this simply means ‘no littering’. Certainly, we all need uncluttered surroundings by garbage for emotional and physical sense of peace. A clean-up drive by itself is often just removal of litter.

2. To protect human life

Health is another basic human desire. We want to do away with garbage that breeds flies, roaches, rodents, and harmful bacteria that can spread disease. In the past, the

conventional practice to deal with this objective is to burn garbage or to transfer garbage someplace else like dumpsites or landfills. However, burning garbage causes air pollution which brings about another set of problems. Burning chlorine-containing material, e.g., certain types of plastics, can produce the toxic compounds, dioxins and furans. It has been found that even some garden waste can produce these chemicals when burned. This is the reason incinerators have been banned in the Clean Air Act and open burning is not allowed in the Ecological Solid Waste Management Act Furthermore, burning of carbon-based materials produces carbon monoxide which is hazardous, and, carbon dioxide which contributes to global warming. Also, bringing garbage to dumpsites and landfills simply transfers the problem from one site to another.

3. Another objective is to alleviate the dumpsite crisis.

In times past, when houses had yard space and materials were all biodegradable, wastes that could not be reused or fed to animals were buried in the backyard. At present, urban living in limited spaces often does not allow for individual burial grounds at the same time, life is dominated by plastics which do not decompose. This is why dumpsites, large and small, formal and informal, are now found in practically all communities. We can help by minimizing the garbage that ends up in dumpsites

4. Another objective is to turn waste into resource and thus help slow down depletion of the Earth's resource

We can turn waste into resource by disposing of waste where it can be useful again.For example, recyclables should go back to factories, biodegradables can become feed for animals, or be composted and applied in gardens or to crops When we recycle glass, we lessen the pressure on our beaches from which silica, the main material for glass, comes. When we recycle metals like aluminum, tin and iron, we help lessen mining which brings about a host of problems - deforestation, soil erosion, siltation, toxic chemicals, etc. When we recycle plastic, we conserve petroleum, the raw material for plastic. When we recycle paper, we conserve trees. When we compost, organic matter and minerals are returned to the soil and Enrich it minimizing the need for fertilizer.

5. An optional objective is to generate income from: 1) raw waste or 2) crafts and other products from raw waste.

= Income can be generated from the sale of recyclable and/or composted materials and objects made of recyclable materials.

Schools which care to make money from waste need a higher-order system to coordinate the activities involving human resources and possibly, some infrastructure.

6. For schools, the following objective is a must: To educate students on the rationale, theories, and practice of Solid Waste Management

The students must understand and internalize the concept that "Everything must go somewhere" and that waste is a resource in the right place. Vice versa, resource is a waste in the wrong place.

Who decides on the objectives and implementation of the Waste Management practice?

A multi - sectoral Committee should oversee the Program starting with the objectives. The multi - sectoral committee should have representatives from:

1. Administration
2. Faculty
3. Students
4. Maintenance Office / General Services (janitorial; gardeners)
5. Cafeteria concessionaire
6. Junk dealers may be included on an ad hoc basis. They should be consulted to determine what wastes have commercial value and which therefore they will collect and bring to factories. Compost buyers can also be consulted.

The WMP should have a mandate from the top management because the program will have implications on budget, space, job descriptions, schedules, purchasing, and other aspects.

Preferably, an officer of the school should be designated as the overseer of the entire program.

The faculty can explain, guide, model, and encourage SWM and reinforce learning through their particular subjects.

Students should be involved because they form the majority of the community. They are in the best position to say what would motivate them and facilitate their involvement.

The Maintenance people are essential to the success of the SWM Program. The janitors who collect, the gardeners who clean the grounds, the Director who arranges for the hauling of the garbage out of the campus - they know what procedures are possible and what are not.

They can make or break your SWM program even though in the organizational hierarchy they are often overlooked in terms of decision making.

The cafeteria generates a lot of waste, both organic or biodegradable, and inorganic or non-biodegradable. Their cooperation is necessary both in terms of proper segregation and disposal and in terms of feedback as to student behavior and attitudes. They have to implement school decisions, e.g., if the school decides that disposable containers should not be used

B. Your Waste Characterization

Segregation of predominant waste whether you intend to sell them or not, ensures maximum retrieval by recyclers. In schools, a lot of paper is generated. It makes sense to segregate them.

C. Receptors/Buyers of Your Waste

If there are pig raisers who can buy or pick up your food waste, why not segregate these? If there is a community who can make use of your door packs, you might want to have a separate container for them.

D. Your Resources – Human, Material, Financial

Who will manage the program? Where will you situate your Materials Recovery Facility (MRF), if any? How much space you have will determine your composting scheme?

2. The bases for segregation are the nature and the final destination of waste. Classifying into biodegradable and non-biodegradable is the simplest mode but raises still a lot of questions. Biodegradables can go either to pig raisers or to the compost pit. Dry paper is biodegradable but it is best recycled. Non-biodegradables can be either recyclables or residuals. Recyclables go to factories; residuals go to the dumpsite or kept in dry and clean condition until use can be found for them.

3. The WMP must have a mandate from top Administration. The journey towards an efficient and effective WMP requires patience, determination, and political will. The program requires resources which only management can decide on.

4. A written school policy is most advisable for the guidance of all.

5. The committee to oversee the project must have representatives from the pertinent sectors of the school. Administration knows the management constraints; faculty must know how to guide the students; students can give feedback as to what works and what

doesn't; maintenance people are nearest to the implementation; the Maintenance Officer deals with the haulers, etc.

6. As a rule, there must be one person or group determined to make the whole endeavor.

7. Practice what you teach.

Those who teach and enforce the WMP must practice WMP at home themselves. In the academe, it is also important to synthesize ideas into basic concepts on which implementation will be based.

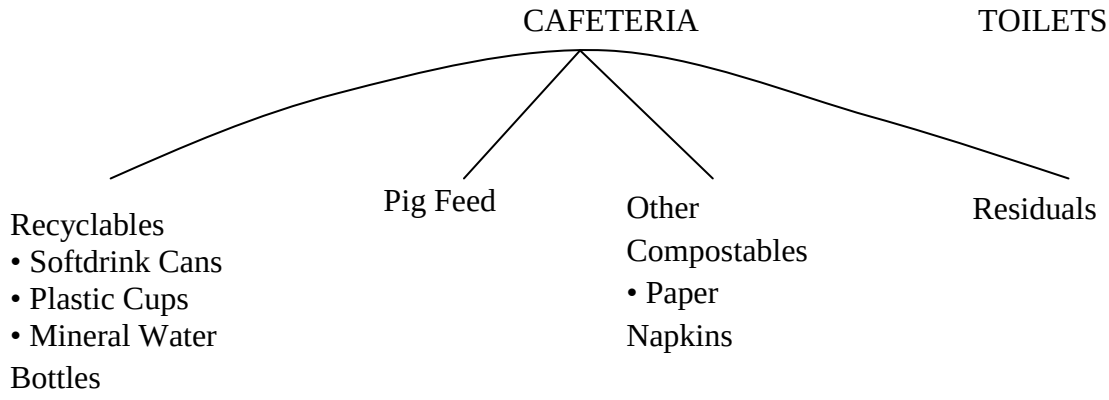
Some examples of school areas and the respective waste generated in big volumes which should be allotted separate bins:

Paper and
Paper Products

Softdrink Cans
Plastic Cups
Mineral Water
Bottles
Pig Feed
Paper Napkins
Residuals

Tissue
Feminine Napkins

CLASSROOM



CONCLUSIONS

1. The Environmental Management Program of the Kalinga - Apayao State College is moderately implemented with a total weighted mean of 2.0.
2. The Stakeholders involved in the study which includes the students, faculty and staffs are moderately aware on the provisions of the Environmental Management Program of the College.
3. A Waste Management Guide was proposed by the respondents to be used by the State College.

RECOMMENDATIONS

1. Written school policies on proper waste management are most advisable for the guidance of all stakeholders.
2. The Environmental Management Program must be institutionalized through concrete steps, mechanisms and policies in all parts of the organization.
3. Intensive Information Campaign is needed for proper dissemination of the program.
4. The proposed Waste Management Guide can provide guiding principles in the implementation of the program.

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