LEVEL OF AWARENESS AND PRACTICES ON SOLID WASTE MANAGEMENT IN BALO-I WEST DISTRICT

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ABSTRACT

This study sought-after to determine the pupils' level of awareness and practices on solid waste management regarding segregation, reuse, recycle, reduce, and disposal throughout the school year 2019 – 2020. The respondents of the study were the 292 Grade Five and Six pupils from Dadoan Elementary School, Momungan Elementary School, and Bangko Elementary School. Data were gathered, analyzed and interpreted using weighted mean and chi-square test. The overall assessment of the respondents' awareness showed that they were conscious of the solid waste management. With regard to pupils' practices, the results indicate that they have average level of practices in disposal, reusing, and reducing, whereas, having a low level in segregation and utilization of unwanted materials. The result additionally reveals that pupils' awareness on solid waste management had affected their practices specifically in segregation, reusing, and reducing wastes. This means that pupils having lower practices on solid waste management can be linked to their awareness. However, the pupils' awareness relative to recycling and disposal of solid wastes aren't considerably connected. This means that a number of the pupils' practices on solid waste management aren't influenced by their awareness. From the findings gathered, a plan of action was proposed with the hope of achieving an effective solid waste management program thereby lessening its harmful effects and problems to health and environment. The collaboration between administrators, teachers, pupils, and stakeholders is essential in achieving a sustainable solid waste program.

Keywords: Awareness, Pupils' Practices, Solid Waste Management

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Introduction and Rationale

Solid waste management is the assortment, treatment, and disposal of solid materials that square measure discarded by purpose or not helpful. People use materials to satisfy their wants, a number of these materials are being discarded once used and regarded as solid waste. Through education, we tend to acquire information and skills on the way to dispose our wastes.

Individuals who are well-educated in environmental views behave responsibly regarding the environment (Mobley et al., 2010). Environmental education is a crucial part in raising awareness and understanding of environmental problems inside schools, and in active property behaviors.

Awareness of solid waste management can produce amendment on; however, people investigate garbage. It is a key for pupils to be concerned within the waste management program of the schools wherever effective and properly implementation can be achieved (Baula, 2010).

Republic Act 9003 Solid Waste Management Act Implementing Rules and Regulations, Part 6, Rule 21, Section two enjoins the Department of Education (DepEd) to sharply incorporate ecological solid waste management within the establishment in the slightest degree levels, action the involvement of administrators, teachers, and students to apply waste management principles like segregation at supply, reduction, recycling, re-use, and composting, to push environmental awareness and action among the students. DENR has associate finish goal of enhancing the capability of students' waste management through ESWM program. Through this project,

students, teachers, and administration was authorized to form their own school-based solid waste management program (Baula, 2010). However, the implementation of those mandates to schools weren't measured.

Schools function the place of learning and wherever youngsters pay most of their time in finding out and taking part in. A clean, safe, secure, and facilitative learning atmosphere is an imperative requirement to make sure the optimization of a child's educational potential (Elemile et al., 2018).

Schools are group action the environmental awareness through category discussions, programs and activities, however, as discovered, waste sorting and segregation isn't absolutely practiced and as a result utilization and different correct disposal practices become cumbersome. The issues related to the waste disposal in schools include littering of food remains, improper disposal of garbage, open dumps and burning of waste. These practices square measure dismaying as a result it generates environmental and health hazards.

Thus, the study was planned to assess the amount of awareness and practices among Grade Five and Six pupils of the three chosen schools on solid waste management for the school year 2019 – 2020.

The result of the study may also provide baseline information for the educational planners and policy-makers in formulating and integrating policies regarding solid waste management. This could function a guide for administrators and teachers in designing Annual Improvement Plan in engaging activities that may enhance the level of environmental awareness needed by the pupils.

Literature Review

The primary reason behind ecological degradation is the incontrovertible fact that there are too many of us living in too unequal societies and creating use of too several unsustainable technologies, and intense several resources, that eventually turn out an excessive amount of waste. Property is also led to through smaller populations living in comparatively equal societies, creating use of applicable inexperienced technologies, intense responsibly, reusing waste, and manufacturing less waste (Baula, 2010).

Waste management isn't a contemporary principle, however, in reality a natural response to existence. Humans naturally understand what to try to do with their waste as a proved by the instituted waste management systems within the postmodern and trendy forms. However, alongside world industrial enterprise and population explosion, waste production blew out of proportion, endangering the atmosphere and threatening humans and different living things (The Importance of Waste Management, 2014).

The introduction of integration of waste management ideas and themes through environmental education, and college course of study in the slightest degree levels won't solely improve students' understanding of waste management however additional seemingly to alter they're on the face of it unfriendly waste management behavior and practices (Ifegbesan, 2010).

Adopting associate ecological solid waste management program and promulgating rules and rules in policies square measure necessary for

designing, design, and operation of solid waste management program. Its absence will impede or limit improvement of waste management.

According Superales (2015), it's vital to coach the youngsters on, however human activities have an effect on the atmosphere as a result of the solutions still lie on our attitudes, values, actions, and therefore, the extent of our awareness on the atmosphere we tend to live. By harnessing the idealism of the youth, student leaders will influence their fellow students and oldsters to become catalyst for amendment not solely in colleges however additionally in their communities.

The disposal of solid waste ought to be a part of an integrated solid waste management system. This can facilitate in having a clean and healthy atmosphere innocent of diseases. A study by Desa et al. (2012) that assessed the attitudes, behavior, and practices towards the solid waste management of 591 first year students from UKM, Bangi field showed that students have a high level of behavior and practices relating to solid waste management program. However, it had been noted that waste education and awareness strategy are still required to develop additional students' awareness and perspective towards managing solid waste to scale back the impact of the waste problem on the school campus.

However, awareness might not simply be translated into practices. Ifegbesan (2010) explored on the level of awareness and practices of waste management of 650 secondary school students from Ogun State in Federal Republic of Nigeria. The findings showed that students were attentive

to the intense downside of waste management in their college, however they'd poor waste management practices. It had been indicated that there's a major relationship between students' demographic profile and their information and practices of waste management. The results could also be copied to an ineffective waste management education design for school children.

Lastly, Hadi (2010) explicit that information on the environmental issue is the solely factor that determines environmentally aware people which guarantee motivation on pupils to adopt new behavior. It ought to be deeply frozen within the education system, the least bit levels of faculty education (Khan, 2013) particularly additional focus attention to elementary pupils (Cetin & Nicanci, 2012). Also, Yildiz, Yilmaz, Demir, & Toy (2011) conducted a study to search out the notice and sensibility levels of 350 campus people regarding environmental issues in Erzurum, Turkey. The findings unconcealed that the respondents showed a moderate level of awareness and sensibility regarding the environmental problems; however, despite their information of the issues, the themes of the study did not showed interest in them.

Research Questions

This study assessed the pupils' level of awareness and practices on solid waste management in Balo-i West District. Specifically, it sought to answer the following questions:

1. What is the level of pupils' awareness on solid waste management?

2. What is the level of pupils' practices on solid waste management in terms of segregation, reduce, reuse, recycle, and disposal?
3. Is there any significant relationship between pupils' level of awareness and their practices on solid waste management?
4. What action plan can be formulated based on the result of the study?

Scope and Limitation

The study aimed to determine the pupils' level of awareness and their practices on solid waste management. The respondents of the study were the 292 grade five and six pupils of the three schools of Balo-I West District namely: Dadoan Elementary School, Momungan Elementary School, and Bangko Elementary School for school year 2019 – 2020.

Research Methodology

The study employed descriptive-correlational type method. The descriptive method was specifically employed on the awareness and practices on solid waste management of the respondents. A descriptive method of research is a study designed to depict the participants in an accurate way.

a. Sampling

This study used purposive sampling in the selection of the respondents. The purposive technique is a type of non-probability sampling technique. Non-probability sampling focuses on sampling

techniques where the units that are investigated are based on the judgment of the researcher.

Name of School	No. of Grade Five Pupils	No. of Grade Six Pupils	No. of Respondents in every school
Dadoan Elementary School	50	45	95
Momungan Elementary School	55	60	115
Bangko Elementary School	42	40	82
TOTAL	**147**	**145**	**82**

b. Data Collection

Prior to data gathering, the researcher secured a letter of permission from the district supervisor and selected principals allowing her to conduct the study among Grade Five and Six pupils of the three selected schools. Upon approval, the researcher distributed the questionnaires to the respondents which were collected afterwards.

The study utilized two sets of instruments. First, a questionnaire consists of 20 items adapted from Abolucion, et al. (2012) was used to assess the level of pupils' awareness on solid waste management.

To determine the level of pupils' awareness on solid waste management, the scoring guideline below was used.

Score	Description
1.00 – 1.49	Not aware
1.50 – 2.49	Not so aware
2.50 – 3.49	Aware
3.50 – 4.00	Fully Aware

The second instrument was adapted from Cahoy (2013). This was used to assess the pupils' practices towards solid waste management. It consists of 24 items with five components namely: segregation (5 items), reduce (5 items), reuse (5 items), recycle (4 items), and disposal (5 items).

To determine the solid waste management practices of the pupils, the scoring guideline below was used.

Score	Description
1.00 – 1.49	Very Low
1.50 – 2.49	Low
2.50 – 3.49	Average
3.50 – 4.49	High
4.50 – 5.00	Very High

To establish the reliability of the instruments, it was pilot-tested to 50 pupils of Pacalundo Integrated School, whom they were not included in the final survey. The reliability index yielded 0.80 using Cronbach alpha.

c. Ethical Issues

The researcher observed the highest ethical standard and uphold ethical principle in evaluating and implementing the research. It ensures the confidentiality of the data given by the respondents.

The principle of free, prior and informed consent and recognition and protection of communal intellectual and cultural property right were considered and adhered throughout the research process.

d. Data Analysis

After gathering the data, the researcher interpreted, tabulated, and analyzed the data using the following statistical tools. ***Weighted Mean***

used to determine the pupils' level of awareness and practices on solid waste management and ***Chi-square*** used to determine the significant relationship between the variables considered.

Discussion of Results and Recommendations

Problem 1: What is the level of pupils' awareness on solid waste management?

Table 1
Level of Pupils' Awareness on Solid Waste Management

	Indicators	Mean	SD	Descriptive Equivalent
1.	Republic Act 9003	1.54	.809	*Not so aware*
2.	Solid Waste Management (SWM) Program of the School	2.70	.981	*Aware*
3.	School's orientation on SWM Program.	2.84	.992	*Aware*
4.	Policies of the SWM Program.	2.50	1.003	*Aware*
5.	Corresponding sanctions of any violations of the SWM program.	2.27	1.073	*Not so aware*
6.	Solid waste management committee of the school.	2.16	1.087	*Not so aware*
7.	Purpose of the management on implementing the SWM program.	2.70	1.106	*Aware*
8.	School's SWM program is a big help in achieving clean and green environment.	2.77	.974	*Aware*
9.	Importance of SWM.	2.41	1.092	*Not so aware*
10.	Practicing SWM saves money and energy.	2.54	1.026	*Aware*
11.	Student's roles and responsibilities towards school's SWM program.	2.78	.970	*Aware*
12.	Unity is very significant in making up and internalizing the SWM.	2.86	.965	*Aware*
13.	Implementation will be successful and effective if concerned people will participate.	2.74	1.023	*Aware*
14.	Discipline on SWM matters a lot.	2.70	.970	*Aware*
15.	Proper disposal of garbage.	3.22	.889	*Aware*
16.	Possible illnesses that you can get whenever trashes are not properly disposed.	2.94	.989	*Aware*
17.	Before throwing garbage, it is a must to read those trash-can labels for segregation.	2.86	.983	*Aware*
18.	Identification of biodegradable from non-biodegradable.	3.08	.945	*Aware*

19.	Importance of recycling.	2.87	.919	*Aware*
20.	Waste minimization practices like reuse, recycle, and reduce.	2.87	.957	*Aware*
	Over-all Mean	**2.67**	**.399**	***Aware***

Scale: 1.00 – 1.49 *Not Aware*; 1.50 – 2.49 *Not so aware*; 2.50 – 3.49 *Aware*; 3.50 – 4.00 *Fully Aware*

Table 1 shows the respondents were aware on the proper disposal of garbage (*M=3.22, SD=0.889*); aware of identifying biodegradable from non-biodegradable wastes (*M=3.08, SD=0.945*); they are mindful of the possible illnesses that they can get whenever trashes are not properly disposed (*M=2.94, SD=0.989*); pupils were also aware on the practices like reuse, recycle, and reduce; the solid waste management program of their school, its policies and purposes, and they are aware of their responsibilities towards school's solid waste management program.

Manteaw (2012) describes awareness as an action to global issues and sustainable development and therefore connects it to education. To achieve that, importance of education, awareness and training is highlighted in changing behavior (Leal, et al, 2008). Giving social duty awareness along with waste management awareness may improve the practices of pupils.

However, the respondents are not so aware on the importance of SWM (*M=2.41, SD=1.092*); the corresponding sanctions of violating SWM program (*M=2.27, SD=1.073*); the SWM committee of their school (*M=2.16, SD=1.087*); and they were not so aware of the Republic Act 9003 (*M=1.54, SD=0.809*). Oguz et al. (2010) argued that respondents' high awareness on environmental problems is not an insurance to increase pro-environmental behavior. Teachers need to be exposed to real environment situations to bring about change in attitude and behavior of young individuals (Murdoch,

2012). Knowledge on the issue to integrate and conduct orientation/workshops among teachers and pupils on the School-Based Solid Waste Management (SBSWM) will improve awareness on the program.

Generally, the assessment of the respondents showed that they are aware of the solid waste management (*M=2.67, SD=0.399*).

Problem 2: What is the level of pupils' practices on solid waste management in terms of segregation, reduce, reuse, recycle, and disposal?

Table 2
Level of Pupils' Practices on SWM in terms of Segregation

Segregation	Mean	SD	Descriptive Equivalent
1. I segregate biodegradable (paper, banana peels, and vegetables) and non-biodegradable (plastic toys, glass, steel, rubber) waste at school.	2.24	.975	*Low*
2. I separate recyclable wastes (paper, cardboard, plastic bottles) from non-recyclable (food wastes, leaves, twigs) wastes at school.	2.30	1.011	*Low*
3. I separate non-harmful wastes from toxic and hazardous wastes such as pentel pens, laboratory chemicals, ink, cell batteries and others.	2.27	1.057	*Low*
4. I mix all the garbage in one garbage container.	2.69	1.116	*Average*
5. I segregate recyclable items for collection.	2.36	1.027	*Low*
Over-all Mean (*Segregation*)	**2.37**	**.551**	***Low***

Scale: 1.00 – 1.49 *Very Low*; 1.50 – 2.49 *Low*; 2.50 – 3.49 *Average*; 3.50 – 4.49 *High*; 4.50 – 5.00 *Very High*

Table 2 depicts that respondents have an average practice in mixing all their garbage in one garbage container (*M=2.69, SD=1.116*), but pupils have low practices in segregating recyclable items for collection (*M=2.36, SD=1.027*); separating recyclable wastes from non-recyclable wastes at school (*M=2.30, SD=1.011*); segregating biodegradable from non-biodegradable waste at school (*M=2.24, SD=0.975*); and separating non-harmful wastes from toxic and

hazardous wastes. This implies that pupils have low practices in segregating solid wastes (*M=2.37, SD=0.551*).

In the study conducted by Ehrampoush & Moghadam (2005), the findings showed that students had a moderate knowledge of solid waste disposal but their knowledge did not influence them to practice segregation of solid waste. The first stage of recycling process is to separate materials into different categories, if waste is not separated at the source, it ends up at a disposal site where all waste is mixed up and becomes much more difficult and hazardous.

Accordingly, teachers should integrate lessons and activities on the importance of practicing separation of garbage that would lead to reduction of solid wastes for disposal.

Table 3
Level of Pupils' Practices on SWM in terms of Reduce

Reduce	Mean	SD	Descriptive Equivalent
1. I borrow, share, and/or ret things that are needed occasionally.	2.34	.896	*Low*
2. I buy only what I need so that I will not end up throwing away extra food.	3.27	.878	*Low*
3. I pack my lunch in reusable lunchbox so that I can't buy wrapped/packed food at the school.	2.62	1.165	*Average*
4. I bring water in reusable water bottles than buying water in one-used plastic bottles at the school.	2.60	1.005	*Average*
5. I am cautious and responsible to every waste I produce.	2.69	.988	*Average*
Over-all Mean (*Reduce*)	**2.70**	**.519**	***Average***

Scale: 1.00 – 1.49 *Very Low*; 1.50 – 2.49 *Low*; 2.50 – 3.49 *Average*; 3.50 – 4.49 *High*; 4.50 – 5.00 *Very High*

Table 3 shows that the pupils have an average practices in being cautious and responsible to every waste they produced (*M=2.69, SD=0.988*); they packed their lunch in reusable lunchbox so that they can't buy packed food at school

(*M=2.62, SD=1.165*); and they practiced bringing water in reusable water bottles than buying water in one-used plastic bottles at school.

Yet, pupils have low practices in buying only what they need so that they would not end up throwing away extra food (*M=3.27, SD=0.878*); and borrowing/sharing things that are needed occasionally (*M=2.34, SD=0.896*). Respondents have an average level of practices in reducing solid wastes (*M=2.70, SD=0.519*). It suggests that schools may proposed initiatives on waste reduction since pupils have been practicing ways on lessening discarded materials.

Desa et. al. (2012) concluded that doing waste reduction and reuse are effective at reducing environmental impact on waste. The most effective way to limit the health effects and environmental impacts of a waste is to make new products whilst producing less waste to reduce pollution.

Table 4
Level of Pupils' Practices on SWM in terms of Reuse

Reuse	Mean	SD	Descriptive Equivalent
1. I reuse my old materials than buying a new one.	2.84	1.013	*Average*
2. I keep those unfilled papers and used it as scratch.	2.83	.997	*Average*
3. I reuse grocery bags.	3.07	.969	*Average*
4. I reuse washable food containers.	3.10	.962	*Average*
5. I reuse scrap paper into memo pads.	2.65	1.060	*Average*
Over-all Mean (*Reuse*)	**2.90**	**.573**	***Average***

Scale: 1.00 – 1.49 *Very Low*; 1.50 – 2.49 *Low*; 2.50 – 3.49 *Average*; 3.50 – 4.49 *High*; 4.50 – 5.00 *Very High*

Table 4 presents that the respondents have an average practice (*M=2.90, SD=0.573*) in terms of reusing solid wastes. It signifies that pupils practiced reusing their washable food containers, grocery bags, old materials than buying

a new one, keeping unfilled papers and using it as scratch, and reusing scrap paper into memo pads.

Teachers have the responsibility to teach and guide students to understand profoundly and respond appropriately to the problem of solid waste management (Esa, 2010). Reusing materials eliminates the environmental damage that would have been caused if disposed and can be very helpful for people who cannot afford to buy goods.

Table 5
Level of Pupils' Practices on SWM in terms of Recycle

Recycle	Mean	SD	Descriptive Equivalent
1. I convert or redesign waste materials into a new product.	2.09	1.020	*Low*
2. I make decors out of plastic wrappers and other colorful waste materials.	2.19	.996	*Low*
3. I ignore the importance of recycling.	1.97	.955	*Low*
4. I initiate generating-income out of waste materials.	1.97	1.022	*Low*
Over-all Mean (*Recycle*)	**2.05**	**.663**	***Low***

Scale: 1.00 – 1.49 *Very Low*; 1.50 – 2.49 *Low*; 2.50 – 3.49 *Average*; 3.50 – 4.49 *High*; 4.50 – 5.00 *Very High*

Table 5 shows that the respondents have low level of practices in making decors out of plastic wrappers and other colorful waste materials (*M=2.19, SD=0.996*); converting or redesigning waste materials into a new product (*M=2.09, SD=1.020*). Pupils did not ignore the importance of recycling (*M=1.97, SD=1.022*), but they are low in initiating generating-income out of waste materials. It denotes that if pupils are aware on solid waste management, they can identify and save recyclable materials out of waste. This supports the findings of Grodzinska-Jurczak et al. (2003) that school waste education program brings about positive effects to the students and parents in terms of knowledge, attitude, and behavior toward recycling.

Recycling is the method of waste disposal people would want to use (Abu-Duhier, 2015). This practice treats the materials as valuable resources rather than as waste; it has many benefits and it needs a market for the end product to be economically sustainable.

Table 6
Level of Pupils' Practices on SWM in terms of Disposal

Disposal	Mean	SD	Descriptive Equivalent
1. I throw and left my garbage anywhere.	2.20	1.050	*Low*
2. I burn waste materials.	2.90	1.004	*Average*
3. I throw waste materials in common open dumps.	2.83	.988	*Average*
4. I dispose biodegradable wastes into a compost pit.	2.42	1.086	*Low*
5. I dispose hazardous/toxic/special wastes such as laboratory left-over (chemicals) or electronic waste in any garbage container.	2.26	1.038	*Low*
Over-all Mean (*Disposal*)	**2.52**	**.505**	***Average***

Scale: 1.00 – 1.49 *Very Low*; 1.50 – 2.49 *Low*; 2.50 – 3.49 *Average*; 3.50 – 4.49 *High*; 4.50 – 5.00 *Very High*

Table 6 displays that the pupils have an average level of practices in burning their waste materials (*M=2.90, SD=1.004*) and throwing in common open dumps (*M=2.83, SD=0.988*). Respiratory diseases are brought by the burning of garbage in backyards and landfills produce methane gas which is a potent greenhouse gas (Baula, 2010). Pupils slightly observed the practices in disposing biodegradable wastes into a compost pit (*M=2.42, SD=1.086*); disposed hazardous/toxic/special wastes in any garbage container (*M=2.26, SD=1.038*); and throw and left their garbage anywhere. Result means that the respondents have an average level of practices on solid waste management concerning disposal.

Solid waste poses various threats to public health and adversely affects flora and fauna as well as the environment especially when it is not

appropriately disposed. Schools should include in their curriculum the proper waste disposal that hinders the other practices of waste management.

Problem 3: Is there any significant relationship between pupils' level of awareness and their practices on solid waste management?

Table 7
Relationship Between Pupils' Level of Awareness and Their Practices on Solid Waste Management

Solid Waste Management (*Variables*)		Correlation Coefficient	p-value	Remarks
Awareness	Segregation	.216**	<.001	*Highly Significant*
	Reduce	.195**	.001	*Highly Significant*
	Reuse	.168**	.004	*Highly Significant*
	Recycle	.051	.384	*Not Significant*
	Disposal	.081	.167	*Not Significant*

Note: **-significant at 0.01 level

Table 7 presents the relationship between pupils' level of awareness and their practices on solid waste management. The result shows that pupils' awareness on solid waste management and their practices specifically in segregation, reducing, and reusing of waste materials are significantly correlated. This entails that pupils' cognizance could be related on some of their practices. If pupils are ware on solid waste management, they can segregate waste according to biodegradable, non-biodegradable, and recyclable; they can also identify reusable materials and reuse garbage. Hence, teachers should provide necessary assessment strategies regarding awareness and vulnerability in order to mainstream their pupils on how to behave, react, and cope in factors (Kaur, 2013).

However, pupils' awareness relative to recycling and disposal of solid wastes are not significantly related since the p-values exceeded at the 0.05 level of significance. This indicates that some of the pupils' practices on solid waste management are not influenced by their awareness. Therefore, the null hypothesis of no significant relationship between pupils' awareness solid waste management and their practices in terms of recycling and disposal of solid wastes were not rejected.

Douangchanh (2008) concluded that some of the reasons for the low level of participation in SWM development are inadequacy of SWM campaigns, workshops and community awareness and education programs, lack of coordination and incentives for people to participate in the activities. There is a necessity of giving awareness to the impact of solid waste practices.

The findings of the present study show that respondents are aware of the solid waste management but they are lacking in the practice of proper waste management particularly on recycling and disposal. This finding supports the studies conducted by Ifegbesan (2010) and Vivek et al (2013). This may be due to poor motivation from parents and teachers. Awareness program for parents can be given during PTA meeting and environmental education programs to the teachers at all levels.

In the study made by Baula (2010), the participation is the key when the students are involved in the waste management program of the school,

an effective and sustainable implementation of the waste management practices is achieved.

Thus, the schools should establish eco-waste program that may train pupils and encourage them to be responsible for their wastes. This could also provide them opportunities to generate income out of their wastes. Also, the support of the school's administration to the waste management is also critical to acquire the participation of teachers, pupils, and stakeholders for the attainment of the goals of the program.

Problem 4: What action plan can be formulated based on the result of the study?

Proposed Action Plan

I. Rationale

The over-all results of the study showed that the pupil's awareness on solid waste management have effects on their practices specifically on recycling and disposal. Therefore, the following Action Plan is being proposed.

II. General Objectives

To promote a sustainable Solid Waste Management program through:

- Formulate school activities to increase the awareness, implementation, and practice on recycling and proper disposal of wastes.

- Build linkages with local government agencies for promoting and implementing recycling and proper disposal.

III. Schools' Solid Waste Management Program Matrix

Areas of Concern	Objectives	Action(s) to be taken	Person(s) Responsible	Time Frame	Funding /Budget	Budget Source	Success Indicators
A. Awareness on Solid Waste Management (SWM)	To raise awareness on recycling and disposal. To promote conducive learning environment.	Orientation program/ Seminar-workshop on the importance of recycling and proper disposal. Campaign on SWM through signages, posters, and flyers by the school organization.	Division Representatives (NGP/DRRM), School Head, Teachers, SGC, SPT.	2020-2021	P20,000	MOOE ,Donation (LGUs, Private Sectors)	School head, teachers, and pupils are knowledgeable on the importance of establishing SBSWM Program.
B. Implementation of recycling and proper disposal.	To develop practices on recycling and disposal of garbage. To promote DRRM awareness.	Presence of 3 waste bins (biodegradable, non-biodegradable, recyclable) in offices, classrooms, and school ground.	School head, Teachers, Pupils, PTA Officers, DRRM Representatives (LGU & Division Coordinator)	2020-2021	P50,000	MOOE ,Donation (LGUs, Private Sectors)	At least 80% of the activities are implemented.

		Establishing school MRF. Waste bin for PET bottles/Eco bricks. Making a compost pit for biodegradable wastes. Produce recyclable materials out of wastes. Initiate income generating project (IGP) on SWM.					Proposed IGP on SWM.
C. Sustainable SBSWM Program	To uphold environmental awareness and practices on SWM at school.	Monitoring and Evaluation to verify existing practice.	Division representatives, School head, Teachers, Pupils	2020-2021	P10,000	MOOE ,Donation (LGUs, Private Sectors)	Improved practices on SWM.

Recommendations

For an effective implementation of R.A 9003, it is recommended to have a School-Based Solid Waste Management (SBSWM) Program to be institutionalized

to facilitate awareness and form practices relative to solid waste management among pupils and teachers towards safer and sustainable community.

The local government agencies should fully support the School-Based SWM program specifically on recycling and disposal to draw interest among the school's stakeholders in participating the program.

The school administration ought to strictly implement and integrate the programs as stipulated in: DepEd Order No. 5, s. 2014 (Integration of Gulayan sa Paaralan, Solid Waste Management, and Tree Planting under NGP); DepEd Order No. 72, s. 2003 (Implementation of YES-O). They should implement the proposed workplan to increase the practice on proper disposal and recycling activities in the three chosen schools.

Solid Waste Management seminar-workshop is required to support the school's development program to be participated by teachers, pupils, and stakeholders.

Teachers should integrate SWM to the curriculum starting from first grade to build awareness at an early age and able to perform proper waste management practices. They may give incentive grants for the pupils to be motivated and organize environmental campaign to extend awareness among the pupils.

Division DRRM Coordinators shall conduct monitoring and evaluation for the implementation of the program.

Plans for Dissemination and Advocacy

Dissemination and utilization of research results are crucial in the achievement of learning outcomes and improve teaching-learning and

governance process in school. The researcher will take measures to ensure the dissemination and utilization of research results in various setting such as:

Learning Action Cells (LAC's) .The researcher will maximized the LAC sessions by sharing the result of completed research study. The result may serve as an input for teachers in their respective teaching-learning strategies.

In-Service Training (INSET). The researcher will include discussion of result of the research study in the training design.

School Governing Council. Research results and proposed actions can be presented during school planning and monitoring activities.

Enhanced School Improvement Plan (ESIP)/ Annual Improvement Plan (AIP). The results may be incorporated in the SIP School Planning activities and may also be plotted as research initiatives in the SIP and AIP.

School Report Card (SRC). Interventions made as a result of action results may be included in the SRC.

Research Conferences (Region/Division Level). Results of the study may serve as guide for other researchers to explore other variables that affect the awareness and practices of pupils on solid waste management.

References

Abolucion, D. M. T. (2012). *Awareness on Solid Waste Management among the Residents of Dalipuga, Iligan City.* Undergraduate Thesis. Mindanao State University – Iligan Institute of Technology. Retrieved on September 2, 2019 from https://www.academia.edu/40525113/level_of_awareness_and_practices_on_solid_waste_management_SWM_among_college_students_J._Bio._Env._Sci._14_1_131-138

Baula E. (2010). School-Based Solid Waste Management Initiative in the Philippines: Lessons and Experiences of the Toyota Auto Parts and Sta. Rosa City Partnership. Retrieved on January 6, 2019 fromhttps://scholar.google.com.ph/scholar?hl=en&as_sdt=0%2C5&as_vis=1&q=baula+2010&btnG=#d=gs_qabs&u=%23p%3DCkTtGRyceB4J

Cahoy, A. Z. (2013). *Level of Awareness and Practices on Solid Waste Management among Students in Iligan National High School, Iligan City*. Undergraduate Thesis. Mindanao State University – Iligan Institute of Technology. Retrieved on August 10, 2019 from https://www.google.com/amp/s/www.reserachgate.net/publication/320202045_Awareness_abd_Practices_on_Solid_Waste_Management_among_College_Students_in_Mindanao_State_University_Maigo_School_of_Arts_and_Trades/amp

Cetin, G. & Nisanci, S. (2010). *Enhancing students' environmental awareness.* Procedia – Social and Behavioral Sciences. 2.1830-1834. 10.1016/j.sbspro.2010.03.993. Retrieved on October 17, 2019 from https://www.reserachgate.net/publication/240448248_Enhancing_students'environmental_awareness

Desa, A., Kadir, N. B. Y. A., & Yusooff, F. (2012). *Environmental awareness and education: A key approach to solid waste management (SWM) – a case study of a University in Malaysia. In L. F. M. Rebellion (Ed.), Waste management – an integrated vision*. Retrieved on January 10, 2019 from DOI:10.5772/48169 Retrieved on November 2, 2019 from https://www.sciencediret.com/science/article/pii/S0048969718340440

DepEd Order No. 5, series 2014. *Implementing Guidelines on the Integration of Gulayan sa Paaralan, Solid Waste Management and Tree Planting under the National Greening Program.* Retrieved on October 26, 2019 from https://www.deped.gov.ph/2014/02/07/do-5-s-2014-implementing-guidelines-on-the-integration-of-gulayan-sa-

paaralan-solid-waste-management-and-tree-planting-under-the-national-greening-program-ngp/

DepEd Order No. 10, series 2016. *Policy and Guidelines for the Comprehensive Water, Sanitation and Hygiene in Schools (WINS) Program.* Retrieved on October 22, 2019 from https://www.deped.gov.ph/2016/02/19/do-10-s-2016-policy-and-guidelines-for-the-comprehensive-water-sanitation-and-hygiene-in-schools-wins-program/

DepEd Order No. 72, series 2003. *Establishment of the Youth for Environment in Schools (YES) Organization.* Retrieved on October 14, 2019 from https://www.deped.gov.ph/2003/09/01/do-72-s-2003-establishment-of-the-youth-for-environment-in-schools-yes-organization/

Douangchanh, V. (2008). *Community Participation Development in Solid Waste Management in Lang Probing, Lao PDR*. The World Bank Group. Retrieved on November 1, 2019 from http://research.lpubatangas.edu.ph/wp-content/uploads/2014/04/JETP-Greening-of-the-Solid-Waste-Management.pdf

Ehrampoush, M. H., & Moghadam, M. B. (2005). *Survey of knowledge, attitude, and practice of Yazd University of Medical Sciences students about solid wastes disposal and recycling*. Journal of Environmental Health Science & Engineering, 2(2), 26 – 30. Retrieved on October 26, 2019 from https://www.researchgate.net/publication/26488495_Survey_of_Knowledge_Attitude_and_Practice_of_Yazd_Univerity_of_Medical_Sciences_Students_about_Solid_Wastes_Disposal_and_Recycling/fulltext/0e605514f0c46d4f0ab0eca7/26488495

Elemile O. et. al (2011). *Solid Waste Management Problems in Secondary Schools in Ibadan, Nigeria*. Retrieved on January 6, 2019 from https://scholar.google.com.ph/scholar?hl=en&as_sdt=0%2C5&as_vis=1&q=elemile+2011&btnG=#d=gs_qabs&u=%23p%3Dqn4c49MAbp0J

Esa, N. (2010). *Environmental knowledge, attitude and practices of student teachers*. International Research in Geographical and Environmental Education, 19(1), 39 – 50. Retrieved on October 30, 2019 from https://www.google.com/amp/s/www.researchgate.net/publication/249025197_Environmental_knoeldege_attitude_and_practices_of_student_teachers_amp

Grodzinska-Jurczak, M., Bartosiewicz, A., and Twardowska, A. (2003). *Evaluating the Impact of a School Waste Education Programme upon Students', Parents' and Teachers' Environmental*

Knowledge, Attitudes and Behaviour. International Research in Geographical and Environmental Education Vol. 12, No. 2, pp. 106 – 122. Retrieved on October 12, 2019 from https://www.google.com/amp/s/www.researchgate.net/publication/43502687_Evaluatingthe_Impact_of_a_School_Waste_Education_Programme_upon_Students'_Parents'_and_Teachers'_Environmental_Knowledge_Attitudes_and_Behaviour/amp

Hadi S. (2010). *How to establish environment awareness society behavior, 2010.* Retrieved on January 6, 2019 from http://www.go-learning.org

Ifegbesan A. P. (2010). *Exploring secondary school students' understanding and practices of waste management in Ogun State, Nigeria*. Retrieved on January 3, 2019 from https://www.researchgate.net/publication/228748309_Exploring_secondary_school_students'_understanding_and_practices_of_waste_management_in_Ogun_State_Nigeria

Khan SH. (2013). *A study of attitude towards environmental awareness in relation to certain variables among senior secondary school students*. International Global Research Analysis 2013, 2(4):42744. Retrieved on October 15, 2019 from https://www.researchgate.net/publication/303799878_Environmental_concern_to_attitude_towards_green_products_Evidences_from_India

Kaur S. (2013). *Role of Teachers in Imparting Environmental Education for Sustainable Development.* International Education E-Journal, 2(2). Retrieved on September 23, 2019 from http://scholar.google.com.ph/scholar_url?url=https://pubs.rsc.org/en/content/getauthorversionpdf/c4en00149d&hl=en&sa=X&scisig=AAGBfm1Knz17jmUNL_uKe30uJI708s4Rqw&nossl=1&oi=scholarr

Leal F. W., Pace, P., & Manolas, E. (2008). *Education for Sustainable Development: Current discourses and practices and their relevance to Technology Education.* International Journal of Technology and Design Education, 19(1), 17 – 34. Retrieved on October 24, 2019 from https://www.google.com/amp/s/www.researchgate.net/publication/249831259_When_Businesses_Go_to_School/amp

Manteaw, O. O. (2012). *Education for sustainable development in Africa: The search for pedagogical logic*. International Journal of Education Development, 32, 376 – 383. Retrieved on October 14, 2019 from https://www.researchgate.net/publication/240448248_Enhancing_students'environmental_awareness

Mobley C., Vagias WM., De Ward LS. (2010). *Exploring Additional Determinants of Environmentally Responsible Behavior, the Influence of Environmental Literature and Environmental Attitudes*. Environment and Behavior 2010; 42:420-447. Retrieved on January 4, 2019 from https://scholar.google.com.ph/scholar?hl=en&as_sdt=0%2C5&as_vis=1&q=mobley+2010&btnG=#d=gs_qabs&u=%23p%3DQH__rzAy4HMJ

Murdoch M. (2012). *Environmental literacy of Seventh – day Adventist teachers in the parochial schools of the Florida conference of seventh-day Adventists*. The Journal of Applied Christian Leadership, 6(2):69-87. Retrieved on November 2, 2019 from https://www.semanticscholar.org/paper/Environmental-literacy-of-Seventh-day-Adventist-in-Murdoch/b3976c8539cbcd8381feaf821780854cac23456a

Oguz et. al (2010). *Environmental awareness of University students in Ankara, Turkey*. African Journal of Agricultural Research, 5(19):2629-2636. Retrieved on November 3, 2019 from http://academicjournals.org/app/webroot/article/article1380961160_Oguz%20et%20al.pdf

Paghasian MC. (2017). *Awareness and Practices on Solid Waste Management among College Students in Mindanao State University Maigo School of Arts and Trades*. Advances in Social Science, education and Humanities Research, Volume 128. 3rd International Conference on Education and Training (ICET 2017).Retrieved on November 3, 2019 from https://www.atlantis-press.com/proceedings/icet-17/25883492

Republic Act No. 9003. *The Ecological Solid Waste Management Act of 2000.* Retrieved on January 7, 2019 from http://www.gov.ph/2001/01/26/republic-ct-no-9003-s-2001/.

Superales J. (2015). *Environmental awareness of grade schoolers in the municipality of Zamboanga del Sur, Philippines.* International Journal of Applied Research 2015; 1(9): 711-715. Retrieved on October 1, 2019 from https://www.semanticscholar.org/paper/Environmental-awareness-of-grade-schoolers-in-the-Superales/7a767a5a3e38ee9730bef32f1174172f99a4e81f

The Importance of Waste Management. (2014). Retrieved on January 7, 2019 from Waste Management Guide: http://wastemanagement.bafree.net/

Vivek, R., Licy, C., Saritha, K., Anies, T., & Josphina, C. (2013). *Awareness, Attitude and Practice of School Students towards Household*

Waste Management. Journal of Environment, 02(6), 147 – 150. Retrieved on September 27, 2019 from https://www.researchgate.net/publication/269520226_Awareness_Attitude_and_Practice_of_School_Students_towards_Household_Waste_Management

Yildiz, N. D., Yilmaz, H., Demir, M. & Süleyman, T. (2011). *Effects of personal characteristics on environmental awareness; a questionnaire survey with university campus people in a developing country, Turkey*. Scientific Research and Essays, 6(2), 332-340. Retrieved on October 30, 2019 from http://www.academicjournals.org/article/article1380631023_Yildiz%20et%20al2.pdf

Questionnaire on Solid Waste Management Practices

(Adapted from Cahoy (2013))

Directions:

Please check (/)the appropriate column representing the best answer that describes your practices on solid waste.

Statements	Responses			
	Always	Often	Seldom	Never
SEGREGATION				
1.I segregate biodegradable (paper, banana peels, and vegetables) and non-biodegradable (plastic toys, glass, steel, rubber) waste at school.				
2.Iseparate recyclable wastes (paper, cardboard, plastic bottles) from non-recyclable (food wastes, leaves, twigs) wastes at school.				
3.I separate non-harmful wastes from toxic and hazardous wastes such as pentel pens, laboratory chemicals, ink, cell batteries and others.				
4.I mix all the garbage in one garbage container.				
5.I segregate recyclable items for collection.				
REDUCE				
1. I borrow, share, and/or ret things that are needed occasionally.				
2.I buy only what I need so that I will not end up throwing away extra food.				
3.I pack my lunch in reusable lunchbox so that I can't buy wrapped/packed food at the school.				
4.Ibring water in reusable water bottles than buying water in one-used plastic bottles at the school.				
5.I am cautious and responsible to every waste I produced.				
REUSE				
1.I reuse my old materials than buying a new one.				
2.I keep those unfilled papers and used it as scratch.				
3.I reuse grocery bags.				
4.I reuse washable food containers.				
5.I reuse scrap paper into memo pads.				
RECYCLE				
1.I convert or redesign waste materials into a new product.				
2.I make decors out of plastic wrappers and other colorful waste materials.				
3.I ignore the importance of recycling.				
4.I initiate generating-income out of waste materials.				
DISPOSAL				
1.I throw and left my garbage anywhere.				
2.I burn waste materials.				
3.I throw waste materials in common open dumps.				

4.I dispose biodegradable wastes into a compost pit.				
5.I dispose hazardous/toxic/special wastes such as laboratory left-over(chemicals) or electronic waste in any garbage container.				

Questionnaire on Awareness on Solid Waste Management

(Adapted from Abolucion et al. (2012))

Directions:

Please check (/)the appropriate column representing the best answer that describes your awareness on solid waste management.

Descriptions	Responses			
	Fully Aware	Aware	Not so Aware	Not Aware
1. Republic Act 9003				
2. Solid Waste Management (SWM) Program of the School				
3. School's orientation on SWM Program.				
4. Policies of the SWM Program.				
5. Corresponding sanctions of any violations of the SWM program.				
6. Solid waste management committee of the school.				
7. Purpose of the management on implementing the SWM program.				
8. School's SWM program is a big help in achieving clean and green environment.				
9. Importance of SWM.				
10. Practicing SWM saves money and energy.				
11. Student's roles and responsibilities towards school's SWM program.				
12. Unity is very significant in making up and internalizing the SWM.				
13. Implementation will be successful and effective if concerned people will participate.				
14. Discipline on SWM matters a lot.				
15. Proper disposal of garbage.				
16. Possible illnesses that you can get whenever trashes are not properly disposed.				
17. Before throwing garbage, it is a must to read those trash-can labels for segregation.				
18. Identification of biodegradable from non-biodegradable.				
19. Importance of recycling.				
20. Waste minimization practices like reuse, recycle, and reduce.				

Thank You!