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Managing Solid Waste at Isabela State University Cabagan (ISUC) Campus: Current Practices and Unfolding Opportunities

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ABSTRACT

Solid waste is a pressing environmental concern nowadays. Even academic institutions are not exempted on its associated problems. To this end, the practices and implementation schemes of ISUC in addressing the concerns on solid wastes were assessed. Through individual interviews, actual field observations/validations, and desk review of documents, several qualitative data were generated categorized, summarized and analyzed through content analysis. Results show that in so far as solid waste and its management is concern, the following key issues/concerns were identified: absence of an approved long-term SWM Plan; source of funding support for SWM programs; lack of manpower in implementing the SWM programs; no segregation/reduction of wastes at source; collection system needs to be revisited/changed; open burning and littering of wastes; recovery facilities need improvement; functionality of SWM equipment; and IEC campaign materials. In terms of SWM initiatives, the campus has existing institutional arrangements on dealing with solid wastes concerns. It also has various equipment and manpower to cater the needs for SWM. Source reduction and segregation-at-source are also given attention including collection system but not fully functional/operational. There are also existing recycling initiatives and marketing of recyclables/saleable materials. As to disposal, the special/hazardous wastes from laboratory and health offices are stored in the septic vault beside the campus' Centralized Materials Recovery Facility. In addition, scientific studies were conducted vis-à-vis SWM. However, complementary activities need to be made in place which include: strengthening IEC campaigns; attendance to SWM capacity-building programs; and the adoption of a comprehensive campus-based SWM Framework

INTRODUCTION

One of the pressing environmental concerns nowadays is the problem on solid wastes and society has a great interest on the interconnected effects posed by this issue. As the population continues to grow, so goes with the solid wastes generated by the growing population. Studies show that waste generation is heavily linked with urbanization, economic development, and population growth. Its increasing rates are believed to be driven by rapid urbanization, lifestyle changes, and consumption patterns, resulting inevitably in the rise of greenhouse gas emissions (Gamaralalage, Gilby, & Lee 2015; Kaza et al. 2018). This dilemma, if not being addressed will put communities into peril and this will have cascading effects which will be experienced not only by the present generation but also by the succeeding ones. Peñaflor and Jacinto (2020) stated that solid waste management is rarely at the forefront of discussion, by the media or by the general public. It is usually only during a crisis that much attention is given to waste management. Without crisis, people prefer not to think about waste problem.

In the study of Arora and Agarwal (2011), they mentioned that waste management problems are predominant in developing countries without substantial environmental awareness programs. Licy et al. (2013) concluded that while most people are aware of the negative impacts of mismanaged wastes on the environment, their negative attitude coupled with insufficient environmental knowledge usually corresponds to poor practices towards maintaining good environmental conditions.

The national government has come up with interventions to regulate and address this concern since the 1990s. The Local Government Code of the Philippines (Republic Act No. 7160 of 1991), particularly Section 3 (Operative Principles of Decentralization), mandates that the local government units shall share with the national government the responsibility in the management and maintenance of ecological balance within their territorial jurisdiction, subject to the provisions of the Code and national policies. In addition, Sections 16 and 17, mandate to promote health and safety, preservation of the comfort and convenience of its inhabitants, and to provide solid waste disposal system and services or facilities related to general hygiene and sanitation.

Waste management issues have been hounding both urban and rural communities for decades. The passing of Republic Act 9003, known as the Ecological Solid Waste Management Act of 2000, was meant to ensure the protection of public health and environment, while encouraging resource conservation and recovery, and public cooperation and responsibility (Domingo and Manejar, 2021). This law puts solid waste management into proper perspective. It is hoped that this law will help to meet the growing need to improve the management of increasing volume of solid wastes generated in the Philippines. It can also be said that this law, if implemented properly, has the potential to effectively address the current problems on solid waste management

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(SWM) in the Philippines (Sapuay, 2014).

At Isabela State University Cabagan Campus, Peñaflor and Jacinto (2020) stated that it has been very evident in some places within the campus about the scattered solid wastes mainly due to mismanagement and poor discipline. These practices of campus constituents are not allowed by local and even national level policies, regulations, ordinances, and laws because of the interconnected impacts that it give to the other component of the environment such as the air, soil, water, and even to other organisms, including human beings.

To this end, Isabela State University Cabagan (ISUC) Campus has directed its attention at complying into policies and/or regulations about the concerns on solid wastes. This is to secure its local populace from the menace that the problem on solid wastes can bring. Moreover, this is in support to the mandate of the government as stipulated in Article II, Section 16, of the Philippine Constitution that "The State shall protect and advance the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature." At present, the existing management scheme on solid wastes at Isabela ISUC is not yet fully established. The existing solid waste management initiatives of the campus are highlighted in this paper.

Objectives of the Study

Generally, this study aimed to assess the practices and the implementation schemes of ISU Cabagan Campus when it comes to addressing the concerns on solid wastes. Specifically, the study sought to:

1. identify the key issues and concerns in relation to solid wastes and its management:
2. examine the existing solid waste management programs in the campus;
3. determine complementary programs and unfolding opportunities on managing solid wastes; and
4. generate a solid waste management framework that could be implemented in the campus.

METHODOLOGY

Description of the Study Area

This study was conducted at Isabela State University Cabagan (ISUC) Campus, situated at barangay Garita, Cabagan, Isabela, Philippines. The campus has seven (7) colleges alongside with different units and offices that form this academic institution. Cabagan Campus is one of the 11 campuses (including satellite campus) of ISU system. It is located in the northernmost part of Isabela province.

The campus is comprised of about 302 hectares of land in its site at Barangay Garita, Cabagan, Isabela. This huge tract of land of the campus is predominantly agricultural and grassland. Few patches of dense vegetation cover is also found in the campus. The academic core, campus housing units and the agricultural laboratory areas are the major sources of solid wastes.

Respondents of the Study

The respondents in this study are key informants coming from different offices in the campus administration building which comprise of eight (8) informants. In addition, the 11 members of the Committee on Ecologically Sustainable and Eco-friendly Campus were also enjoined in the conduct of this research. Moreover, three (3) technical specialist from the College of Forestry and Environmental Management (CFEM) also served as key informants.

Data Gathering Procedure

Key Informant Interviews (KII) and Focus Group Discussion (FGD) were done to gather the data needed in this study. In addition, a workshop was also done for the determination of key issues and concerns and the identification of solid waste management programs in the campus. Finally, office and field visits were also conducted in order to validate the information generated from the KII and FGD.

Data Analysis

Through the individual interviews, open-ended questions, observations, and desk review of documents from the campus, several qualitative data were generated. These data were categorized, summarized and analysed through content analysis.

RESULTS AND DISCUSSION

Issues and Concerns vis-à-vis Solid Wastes and its Management

In so far as solid wastes and its management is concern, the following key issues and/or concerns were identified in the campus through the interviews and review of existing office files. The information were categorized and summarized as follows:

Absence of an approved long-term Solid Waste Management (SWM) Plan. The campus has initiated the crafting of its solid waste management plan but until now, the plan has not been presented and/or adopted by the campus administration.

Source of funding support for SWM programs. Based on the review of the document pertaining to financing, it was found out that there is no clear source of funding that would support the SWM program of the campus.

Lack of manpower in implementing the SWM Programs. The campus has a good number of workers but they are assigned into specific tasks from the different offices/ units that they are deployed with. There is no actual manpower that is defined to work on SWM programs.

No segregation and no reduction of wastes at source. Actual observation from the different waste sources revealed an unsegregated solid wastes even in the presence of color-coded trash bins.

Collection system need to be revisited and changed. There is no concrete collection plan. Collection only takes place upon request of head of units/offices and upon approval of the campus administrators.

Open burning and littering of wastes. Actual observation from the different waste sources revealed several traces of open burning and scattered solid wastes throughout major thoroughfares of the campus.

Recovery facilities need improvement. There is a newly established centralized materials recovery facility of the campus but it is not fully operational because the facility is still undergoing completion upon arrival of funding opportunity.

Insufficient Information, Education and Communication (IEC) campaign materials. There are available printed IEC Materials in the campus library and also in the reading room at the Environmental Information Center (EIC) building. However, production of IEC materials to be initiated by the College of Forestry and Environmental Management (CFEM) is necessary. The IEC materials will serve as an important platform to further improve the awareness of the campus constituencies on matters concerning SWM.

Existing Solid Waste Management Programs in the Campus and the Needed Complementary Programs Institutional Arrangements

The Cluster Executive Officer, Dr. Ambrose Hans G. Aggabao, created the Committee on Environmental-Friendly and Ecologically Sustainable Campus who is tasked to work on the planning, implementation, Monitoring and Evaluation of environment and natural resources (ENR) programs of the campus. This is through Memorandum Order issued in 2019. The committee is in the forefront of providing services and in the advocacies of environmental management within the campus. Each of the units within the campus has corresponding roles and responsibilities relative to the ENR (e.g. SWM) program implementation. The following activities have been conducted/initiated in the Campus, which provide strong baseline information on solid waste management in the campus, to wit:

- Creation of the Committee on Environmental Friendly and Ecologically Sustainable Campus;
- Consultation meetings for assistance and support including technical expertise;
- Waste Analysis and Characterization Study and Survey on Students' Knowledge and Practices on Solid Waste Management;
- Documentation of the current Solid Waste Management initiatives within the campus;
- Installation of waste receptacles in the different units/departments and conduct of waste collection;
- Construction of Centralized Materials Recovery Facility including septic vault;
- Presence of vermi-composting facility and waste recycling programs;
- Sales of craps;
- Reasonable Plastic Use Policy and No Paper Crumpling Policy;
- Presence of Environmental Management Code;
- Attendance to trainings, seminars, workshops, and the like; and
- Other environment-related programs and initiatives.

Nevertheless, there is still a need to revisit the implementation of these initiatives and determine additional complementary programs and activities in support to the overall effective management of solid waste in the campus.

These complementary programs and activities shall form as integral part of the Five-year ESWM Plan of the campus. There is a need to identify groups in the campus and define their specific roles and responsibilities relative to the implementation of SWM in the campus. Each of the units within the campus has corresponding roles and responsibilities relative to implementation of the ENR (e.g. SWM) programs and these are presented in the table below.

Table 1: Suggested Office/Units in the Campus with their corresponding key roles and responsibilities.

Office/Unit	Roles and Responsibilities
1. Office of the Cluster Executive Officer	• The over-all supervising body in the implementation of SWM initiatives in the Campus
	• Adopt/craft and enforce/implement policies and regulations relative to SWM
	• Approve Programs, Projects and Activities (PPAs) relative to SWM concerns
2. Committee on Environmental-Friendly and Ecologically Sustainable Campus	• The initiator/promoter of plans, programs, projects or any developmental activity in relation to SWM
	• The coordinating body as to the conduct of plans, programs, projects or any developmental activity pertaining to SWM
	• Monitor and Evaluate the implementation of SWM activities and other ENR related initiatives
3. Campus Planning and Development Office and General Services Office	• Prepare engineering designs regarding infrastructure development of SWM (e.g. MRF, etc.)
4. Campus Clinic	• Overlooks health and sanitation issues in connection to SWM
5. Campus Budget Office	• Allocate and disburse funds for the activities that support the implementation of SWM program

6. College of Forestry and Environmental Management	• Provide support and technical assistance on SWM activities (e.g. Information and Education Campaign, technical know-how regarding SWM, etc.)
	• Prepare and submit project/program proposals to funding institutions in support to the implementation of SWM program
7. Other Colleges/Institute	• Assist in the implementation of the PPAs of the Committee
	• Prepare and submit project/program proposals to funding institutions in support to the implementation SWM program

Inventory of Equipment and Staff

The SWM programs in the campus are not yet fully operational. However, the campus is in the initial stages of implementing the various SWM programs concordant to the mandates of RA 9003. There are existing staff, facilities and equipment by the campus that are being utilized for SWM purposes. Meanwhile, it was included in the "REMARKS" the need for complementary activities which are important to support the available resources in the campus.

The presence of these resources intended for SWM programs in the campus provide strong support in the implementation efforts that the Campus Administration and key staff (both technical and laborers) are doing. With these, however, there is a need to provide complementary efforts such as the provision of engineering, logistical resources and policy initiatives.

Table 2: Inventory of Facilities, Equipment and Staff for SWM

Resources	Availability	Description	Remarks
Staff	At least five (5) were involved but are not working purposely/solely for SWM	These staff come from the General Services Office, Admin Support Staff, and Technical Staff	- need to be clearly identified and should have an organizational set-up - Capability building programs must be put in place to capacitate these staff
Facilities	Materials Recovery Facility	Intended for solid waste storage, processing and recovery of scraps	- there is a need for the completion of the building since it is where the various equipment will be placed/ secured
	Vermi-composting Facility	The processing of biodegradable waste into compost materials are conventionally done but there is an existing production of vermicast (soil conditioner) and vermin (African Night Crawler). This facility is being maintained at the PTIA.	- Composting (i.e. traditional or vermi-composting or enzyme-supported) area shall form integral part of the centralized materials recovery facility - Should be functional and must be sustainably managed
	Processing Facility	The present processing facility of the campus is situated near the Administration building where scraps are transformed into something usable	- Should be sustainably managed and proper work and safety protocols should be in place
Equipment	Wood Chipper	Intended to transform twigs and branches into smaller particles ready for further processing	- Ready for utilization - Need to be placed/secured in appropriate location i.e. the CMRF
	Plastic Shredder	Intended to transform plastic wastes into smaller particles ready for further processing	
	Bio-shredder	Transforms organic wastes into smaller particles to hasten composting	
	Hollander Beater	Intended to transform used papers into fibrous-like particles ready for further processing	
	Collection Vehicle	Intended for the collection of solid wastes from various sources	- Not solely for the purpose of SWM - Need proper care and maintenance

Source Reduction and Segregation-at-source

The Cluster Executive Officer has issued various environment-related policies relating to solid waste management. While it is true that the campus constituencies are doing their usual practice in handling and disposing their generated wastes i.e. thrown anywhere and/or practice open burning, common to all is the segregation of recyclables/saleable solid wastes like metals, cans, plastics, bottles, and the like. These are somehow bringing benefit to them as these are being sold to junkshops or to itinerant buyers. Furthermore, biodegradable materials are not normally collected as these materials are left untouched until they become fully decomposed. Some are also collected for the vermi-composting technology of the PTIA.

In order to promote reduction in waste generation, strong IEC campaigns is necessary. However, the campaign needs to be supported with baseline information (i.e. research results) that can capture the heart of the waste generators and eventually change their ways.

Meanwhile, to make segregation-at-source effective, solid waste receptacles (color-coded i.e. duly labelled and with sack or plastic bag sorters <Green for biodegradable; Blue for recyclable/reusable; Yellow for residual/non-recyclable; and, Red for hazardous/special wastes>) are indispensable. However, in order to fully operationalize segregation-at-source in the campus, there is a need to adopt and/or craft policy on "NO SEGREGATION, NO COLLECTION".

In each location, color-coded plastic drums or receptacles with labels that remind every waste generator of the requirements of RA 9003 will be provided for each building or establishment and other waste generators (small stores, food and restaurants, commercial establishments and others). This practice of segregation at source will facilitate organized collection and further lead to the practice of reducing wastes through recycling and composting which consequently reduces the cost of handling and disposal of wastes. The use of organic fertilizers from composting of biodegradable materials enhances environmental integrity of the colleges and/or the campus in general.

Collection System

There is an existing collection system in the campus and collection equipment are already in place. However, an effective collection scheme will be implemented once the Centralized MRF will become fully operational. It is worthy to note that the construction of the Centralized MRF of the campus has been initiated/launched during the celebration of Earth Day 2019.

In order to ensure that effective collection scheme will be implemented, proper planning needs to be done especially on the aspect of collection route, collection schedule, collection equipment and materials, manpower and other resources. On the collection route alone needs to be designed properly in order to save time and resources. And again, there is a need to adopt and/or craft policy on "NO SEGREGATION, NO COLLECTION".

Collecting and subsequently selling of recyclables (bottles, glass, hard and soft plastics, metals like tin, aluminum, and steel, boxes, and papers) will be encouraged as a scheme for generating funds for each college or unit. While prices of some waste materials fluctuate very often, storing the recovered recyclable for a couple of weeks can have a better selling price in the market, hence, bringing higher profit.

Recycling Programs

Recycled products prepared by the students are outputs from their classes while some are outputs from campus/college-based competition programs. In order to engage campus constituencies on recycling programs, a regular conduct of campus-based competitions can be organized such that the recycled materials can form part of resource generation (either by student organizations, different programs, colleges or by the campus). The durability, sustainability, marketability and social acceptability of the recycled materials shall form major part for the criteria for its production. This is to ensure that the recycled products will not become a waste itself after the competition/selection.

Markets for Recyclables/Saleable Solid Wastes

Junkshop agents (bidders) and ambulant scrap buyers roam around the campus to buy valuable recyclable and/or resalable materials such as PET bottles, glass bottles, cans, metals, newspapers, cartons, other scrap/crafts materials, condemned equipment and vehicles, compost, and the like. A Memorandum of Agreement can be effected between the campus and local junkshop owner/s so as to minimize the entry of ambulant scrap buyers in the campus and so as to develop a way where the junkshop owner/s will be the one to collect the saleable materials in the campus.

Final Disposal

The special or hazardous wastes from laboratory and health offices are stored in the plastic bins or in the septic vault beside the centralized MRF of the campus. These wastes, along with other residual wastes, will be finally disposed to the sanitary landfill facility (SLF) of the Municipality of Cabagan.

Advocacies, Communications and Education (ACE)

People would normally do what they know is acceptable, but sometimes, is not right. Increasing the awareness of the campus constituencies regarding solid waste management is imperative to do. One of the identified problems in the implementation of SWM is the people lack awareness of it. Therefore, Advocacies, Communications and Education (ACE) Campaign is required to raise the level of awareness of the campus constituencies. Once the constituents become aware of the school policies, programs and projects, they will then act rightfully and accordingly into such programs for SWM.

A communication plan needs to be prepared and implemented successfully with the embodied activities such as: Organize ACE Team; Develop and reproduce SWM Promotional Materials; Massive conduct of Briefings and Orientations to various constituents; and Monitor and Evaluate ACE activities. However, the campus still plans to exert more effort in the conduct of ACE/IEC. Only when these are done, the constituents would learn to do what is acceptable and what is right and gradually, the shift in the SWM practices of the constituencies will soon be changed.

Capability-building Opportunities

To fully equip the members of the Committee, so they may become effective and efficient enough in the implementation of their various programs, there is a need to continuously undergo trainings, seminars, conferences, and workshops regarding solid waste management. These will enhance their capability in promoting SWM and at the same time realizing the mandates of RA 9003 and the implementation of various ENR programs in the campus.

Attendance into trainings, seminars or workshops may not always be enough so to consider the personnel to be fully capacitated. Therefore, benchmarking is an activity allowing individuals or groups to visit places having outstanding performances in any field i.e. on SWM. Benchmarking into other schools including LGUs and other places with excellent operation in SWM is also necessary. The results of the KII and the FGD revealed the following needed capability building programs in support to SWM:

1. Seminar/Training cum Development Field Visit on SWM (Plan Formulation, Composting, Innovative Designs, Briquetting, Eco-brick, Eco-hollow Blocks, Plastic/wood tiles, Framing, etc.);
2. Training-Workshop on Waste Analysis and Characterization Study (WACS);
3. Orientation and Action Planning on SWM ;
4. Training-Workshop on Project Proposal Development and Resource Generation in support to SWM; and
5. Among others as may be deemed necessary to support the effective and efficient implementation of SWM initiatives in the campus.

Scientific Studies in the Campus vis-à-vis SWM

Peñaflor and Jacinto (2020) conducted a Waste Analysis and Characterization Study (WACS) in the campus which revealed that majority (77.03%) of generated wastes is biodegradable, residual=12.31%, recyclable=10.49%, and special=0.17%. Residential source generates the highest (14.38kg/day). The per capita waste generation is 0.012kg. As regards volume of disposed wastes, all generated wastes are being disposed. Waste diversion strategy is burning while saleable scraps are sold. Projected waste generation is expected to increase in the next 10 years (2019-2028) with mean annual generation of about 60.15kg. Meanwhile, they also studied the Knowledge and Practices of Students on Solid Waste Management in the campus where they found out that among the indicators that assess students' level of knowledge, "There is money in wastes" got the highest weighted mean (4.44) while "There is an existing collection of garbage by the Municipality" has the lowest mean (2.89). The results prove that the student-respondents have moderate to high level of knowledge on SWM. In terms of the extent of practice, the students are found to be strongly responsible in most of the positive indicators, but they are also responsible (mean=2.20) in burning the uncollected wastes and in throwing garbage into the river or everywhere (mean=1.70). On the other hand, there was no significant difference on the extent of practices of students from various colleges (p-value = 0.101123). Further, results of Spearman's rho revealed a weak correlation (r=0.209) between level of knowledge and extent of practices of students on SWM.

Establishing Solid Waste Management (SWM) Framework in the Campus

A comprehensive ecological solid waste management program is needed in order to satisfy the requirements set forth by existing laws and to ensure that proper solid waste management in the campus is in place. Figure 1 presents the proposed overall framework for the management of solid wastes in the campus. Based on this framework, the Isabela State University Cabagan Campus Solid Waste Management Program has five pillars, namely: Scientific Studies; Institutional Policies and Platforms; Centralized Materials Recovery Facility; Production; and Patent, Publication, Marketing and Extension. These five pillars are as follows:

Scientific Studies

The conduct of scientific studies relative to solid waste management concern is primordial as results of these studies could serve as basis in coming up for policy and institutional innovations. In fact, the results of such studies could be used in coming up for the medium to long term SWM Plan and the review and evaluation of the SWM programs in the campus.

Some of the scientific studies that could be conducted include, but not limited with: Waste Analysis and Characterization Studies; Surveys; Cost-Benefit Analysis; Nutrient Analysis; Test of Durability; Effectiveness of Briquetted Charcoal for Cooking; Charcoal Heating Value; Social Acceptability; Policy Evaluation; among others.

Institutional Policies and Platforms

This pillar is indispensable as all other pillars could not materialized without the strong institutional efforts that would manage all the initiatives being done for the implementation of a comprehensive ecological solid waste management program in the campus.

Some of the initiatives under this pillar include, but

not limited with: Formulation and implementation of a medium to long term SWM Plan; Initiate capability building programs for its constituents; Establish strong partnerships with the LGUs and other potential partners; Provision of other equipment (e.g. Compactor, Glass Pulverizer, Plastic Smelting Machine, Melting Furnace) and design and production of electric hydraulic jack, molders, etc.; Campus and/or University-wide Competitions; Conduct of local and even international Conferences, Seminars, Trainings, Forums, etc.; Deputize Eco-watchers; Ban on Plastics and Styrofoam; No Segregation, No Collection Policy; among others. It is important to mention that some of these initiatives have been tackled above.

Centralized Materials Recovery Facility

Effective solid waste management program in the campus necessitates construction of Centralized Materials Recovery Facility (CMRF) that would cater waste handling i.e. storage, recycling, recovery, and other innovative approaches to solid waste management. At present, there is an established CMRF and its construction manifests the full support of the campus administration for the promotion of a cleaner and greener campus. However, there is a need for the completion of the building. After construction, continuous capacity building programs shall be conducted, implemented or attended by employees and students of the campus.

Some of the prospective set of activities to be implemented in support to the operations of the CMRF include: Serves as the SWM Learning Center (instructional, research and extension purposes); It is where the various equipment and materials (e.g. the available materials such as Plastic and Bio Shredder, Wood Chipper, Digester and the succeeding equipment to be provided institutionally and externally) will be secured; Waste processing; Composting (e.g. Traditional, Vermi-composting and Enzyme-treated composting, etc.).

Production

The CMRF is expected to be constructed to house the solid wastes being generated in the campus to cater waste storage and processing purposes. Other than being a learning center, the Facility will also be used as for various production activities such as but not limited to: organic fertilizer; vermin and vermicast; charcoal briquettes; eco-bricks; eco-hollow blocks; eco-pots; recycled products; among others. These production activities could engage the students that would enable them to earn not only scientific, technical and technological know-how but also financially.

Patent, Publication, Marketing and Extension

All initiatives and various production operations in the campus shall be fully documented (process documentation). Research results, innovative designs, various products, and other noteworthy practices/ initiatives on SWM in the campus shall be either patented,

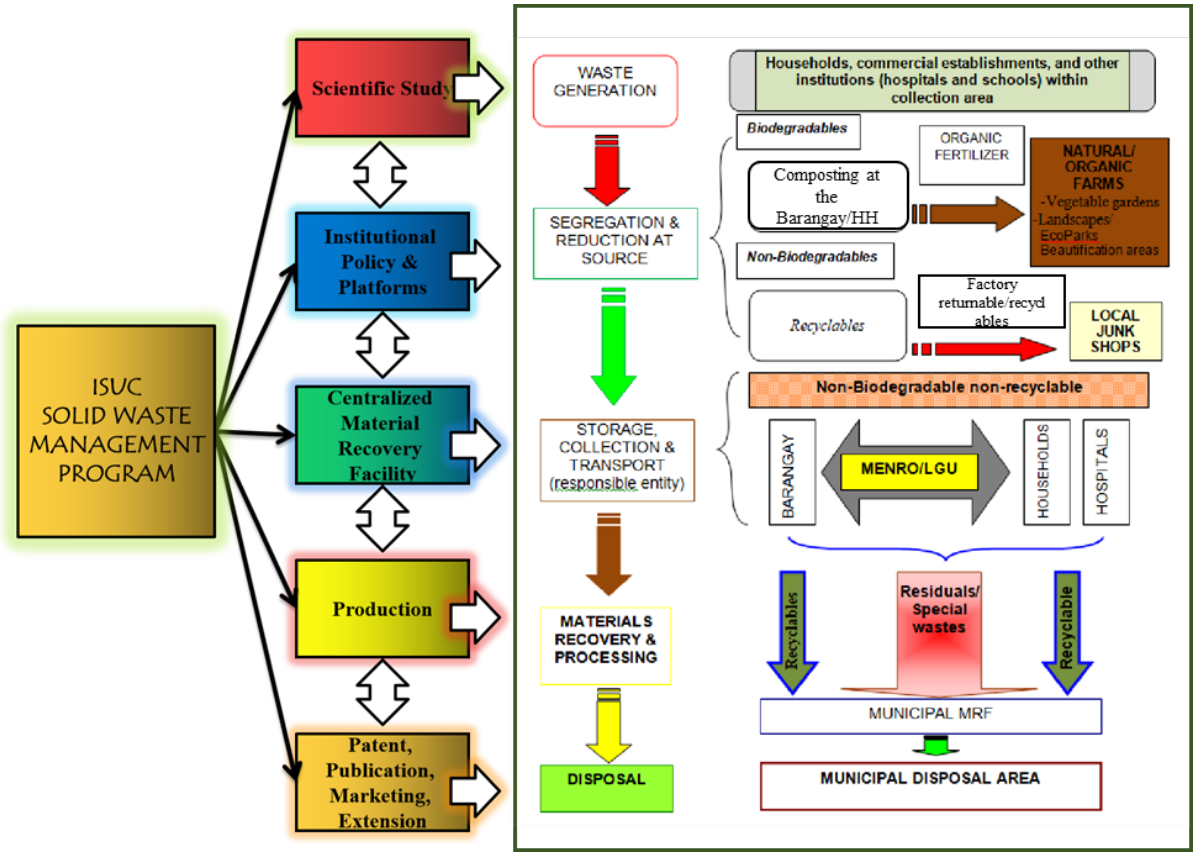

Figure 1: Proposed Campus-based Solid Waste Management (SWM) Framework.

published, marketed or extended to service communities. Such patent, publication, shares on income generating enterprise (IGE), among others, shall be credited to personnel that are actually engaged in such various SWM initiatives in the campus.

It is worthy to note that these pillars described above in Figure 1 shall provide strong support to the overall management of solid wastes in the entire Municipality of Cabagan. In short, strong partnership between the campus and the Local Government Unit (LGU) of Cabagan is necessary.

Administrative and Funding Support

To sustainably implement SWM program in the campus, the Campus Administration can provide the initial funding (as may be deemed appropriate and in compliance to government policies on disbursements). However, once the SWM programs in the campus become fully operational, the income generated from various production operations can provide the needed financial support for the sustainability of the SWM programs. Meanwhile, outsourcing of external funds can also be done through the submission of appropriate proposals to various funding institutions.

In order to realize the objectives of long-term SWM programs, long-term financial aspects is likewise important, hence, the financial commitment of the campus as espoused in this portion is paramount. Overall, the fiscal viability and economic life of all the programs, projects and activities as programmed will be ensured with the ultimate goal of providing social services that protect the environment while responding to the needs of the campus at the least possible cost.

CONCLUSION

The campus is in the initial stages of fully complying with the mandates of the Ecological Solid Waste Management Act. There are significant initiatives in the campus in relation to dealing with solid wastes concerns. However, there is a need for complementary activities that help improve SWM schemes in the campus and to ensure the sustainability of its programs. The proposed SWM Framework provides a strong support to achieve efficiency and sustainability of these programs. The researchers strongly recommend the adoption of the needed complementary initiatives and the adoption and implementation of the proposed SWM Framework as highlighted in this study. Also, review or revision of the draft Solid Waste Management Plan of the campus incorporating the highlights as presented in this research is recommended.

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