Problems Encountered in the Implementation of the Ecological Solid Waste Management Act of 2000 (R. A. 9003) in Narvacan National Central High School

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ABSTRACT

One of today's urgent global issues involves the rise in solid waste resulting from a growing population, leading to environmental degradation. In light of this concern, the research aimed to determine the problems encountered in implementing the Ecological Solid Waste Management Act of 2000 (R. A. 9003) at Narvacan National Central High School, using a Qualitative-Descriptive research method. encompassed a diverse group within the school community, namely students, janitors, parents, teachers and school heads. A total of 30 key informants were included. Interviews were conducted using an interview guide questionnaire to collect data. Content analysis was employed to organize and elicit meanings from the collected data. The results indicated that the school faces various problems in implementing the Ecological Solid Waste Management Act of 2000 (R.A. 9003), including a lack of knowledge and awareness, lack of discipline, supervision deficiency, limited funding and resource allocation, deficient community modeling, lack of coordination and insufficient collaboration. In light of these findings, the study recommends that the school assess the effectiveness of implemented measures and use the findings to make necessary adjustments, continuously improving the school's waste management practices.

Keywords: Problem, Encountered, Implementation, Ecological Solid Waste Management Act of 2000 (R.A. 9003)

INTRODUCTION

A critical environmental issue facing the global community today is the rapid growth of solid waste, fueled by rising populations, urban development, and shifting consumer behaviors. This mounting waste problem contributes significantly to environmental deterioration, posing risks to both natural ecosystems and human well-being. The United Nations Environment Programme (UNEP, 2021) emphasizes that the modern world's increasingly complex and voluminous waste stream has placed immense pressure on waste management systems worldwide.

The situation continues to worsen on a global scale. According to the World Bank (2022), urban areas generated over 2.24 billion tonnes of solid waste in 2020, with projections reaching 3.40 billion tonnes per year by 2050. This growing trend, largely driven by expanding cities and rising consumerism, results in approximately 0.79 kilograms of waste produced per person each day. Disturbingly, around one-third of this waste is not managed through safe and sustainable practices, frequently ending up in open dumps or being burned—processes that release harmful pollutants like black carbon and methane into the environment (World Bank, 2022; UNEP, 2020).

The consequences of poor waste management extend beyond environmental harm to include serious public health threats. In many low- and middle-income nations, waste that is not properly treated contaminates the environment, leading to the spread of diseases such as cholera, dysentery, and leptospirosis—often linked to polluted water sources and inadequate sanitation (WHO, 2021). The COVID-19 pandemic worsened these issues by increasing reliance on disposable plastics, including masks, gloves, and food packaging. A study by Benson et al. (2021) published in the *Journal of Environmental Science & Technology* estimated that at the peak of the pandemic, 129 billion face masks and 65 billion gloves were used globally each month.

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The Philippines faces these challenges as well, often more severely due to its developing status. Even though Republic Act No. 9003, or the Ecological Solid Waste Management Act of 2000, was enacted to address these issues, improper waste handling remains prevalent, especially in urban settings. Challenges include inefficient collection systems, insufficient waste segregation, and limited disposal infrastructure. The Department of Environment and Natural Resources – Environmental Management Bureau (DENR-EMB, 2021) reported that the country generated around 18.05 million tons of solid waste in 2020, not accounting for the additional pandemic-related waste. UNEP (2021) also ranked the Philippines as the fourth-largest generator of solid waste among ASEAN nations.

To address these challenges, local government units, particularly at the barangay level, are encouraged to intensify policy implementation, involve communities more actively, and adopt sustainable waste management practices. However, enforcement remains a significant challenge, along with limited resources and public awareness. These realities highlight the urgent need for a more cohesive and innovative approach to solid waste management—one that prioritizes collaboration, education, and sustainable solutions to safeguard both the environment and public health.

As emphasized in the 1987 Philippines Constitution, Article II, Section 16, the state shall protect and advance the right of the people to a balanced and healthful ecology in accordance with the rhythm and harmony of nature. As of today, several methods have been developed to address emerging waste management issues. The Ecological Solid Waste Management (Solana and Cruz, 2016) in the Philippines, also known as Republic Act 9003, is one of the national programs mandated to address the issue of solid waste management. It provides directives to the local government units (LGUs) for the creation of their respective Solid Waste Management Boards, formulation of ten- year Solid Waste Management Plans, construction of materials recovery facilities (MRFs), and construction of final disposal facilities. However, there has been very little change in solid waste management over the past 16 years of its implementation. A large proportion of the Filipino population is still unaware of the law's implementation and the negative consequences of improper waste disposal.

Likewise, Republic Act 9003 requires the DepEd to strengthen the integration of environmental concerns into school curricula, with a focus on the theory and practice of resource conservation, recovery, source segregation, and recycling. Recent studies emphasize that education is crucial for initiating effective waste management practices at the community level. Thus, teachers play a significant role in implementing waste management practices as outlined in Republic Act No. 9003 (Nabor Jr. & Ortega-Dela Cruz, 2022; Reyes & Madrigal, 2020).

With these, environmentalists emphasize that Republic Act 9003 requires the use of best environmental practices in ecological waste management and expressly prohibits waste incineration as an ecological option. Likewise, the Philippine National Government, in collaboration with the Department of Education (DepEd) and other educational institutions, should conduct a continuous education and information campaign on solid waste management (SWM) practices and strengthen the integration of environmental concerns into school curricula to all extents, with special emphasis on the environment.

Executive Order No. 23 series 2011 has mandated the DADAR- DENR Convergence Initiative to develop a National Greening Program in cooperation with the Department of Education (DepEd), Commission on Higher Education (CHED), Department of Social Welfare and Development (DSWD), Department of Budget and Management (DBM), private sector, and other concerned agencies and institutions.

This National Greening Program is outlined in Section 5.2 of Executive Order (E.O.) No. 26, series 2011, and DepEd Memorandum No. 58, series 2011. Thus, to ensure the efficient and effective implementation of the National Greening Program (NGP), the Department of Education (DepEd) issued these guidelines to integrate the gulayan sa paaralan, ecological solid waste management, and tree growing and caring as key components to attain the goals of DepEd on poverty reduction, food security, biodiversity conservation, and climate change mitigation and adaptation. All other programs and projects related therein shall be integrated under NGP.

In addition, the NGP shall be implemented in all public elementary and secondary schools nationwide by establishing vegetable gardens to serve as food baskets or main sources of commodities to sustain supplementary feeding; practicing waste management principles such as minimization, segregation at source, reduction,

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recycling, re-use, and composting; establishing nurseries/seed banks for the propagation of vegetable seedlings, fruit-bearing trees, and small trees or saplings; and supporting tree planting activity in schools and the communities. The detailed guidelines are contained in Enclosure No. 1. Hence, Regional NGP coordinators, Edukasyong Pantahanan at Pangkabuhayan (EPP) supervisors, Technology and Livelihood Education (TLE) supervisors, and school health personnel are responsible for providing technical assistance to division NGP coordination and monitoring NGP implementation. Similarly, school leaders must take the lead in implementing NGP by incorporating it into their School Improvement Plan (SIP) and other co-curricular activities to ensure the program's long-term viability. NGP will also be used as one of the teachers' performance evaluation indicators.

Schools, like many other institutions, produce considerable amounts of waste on a daily basis. Most of this waste includes food, paper, plastic, and various packaging materials. Research shows that approximately 30% of school waste is made up of food, which can be composted and repurposed as fertilizer or used in sustainability projects led by students (Md Zain et al., 2023). In the United States, public schools generate around 14,500 tons of municipal solid waste each day, with roughly 42% coming from food packaging (Zhang et al., 2022). Programs such as those implemented in Chicago Public Schools, which aim to divert 80% of cafeteria and kitchen waste from landfills, and food waste reduction initiatives in Spanish primary schools, illustrate the effectiveness of targeted efforts in promoting sustainable practices (Chicago Public Schools, 2021; Gallo & Villafañe, 2021). Additionally, universities are increasingly incorporating sustainable waste management systems into their operations to minimize their environmental impact and support broader sustainability goals (Usman et al., 2024). These examples highlight that waste management remains a significant challenge for educational institutions striving to meet sustainability targets, thus underscoring the importance of integrated, institution-wide environmental strategies.

As observed in Narvacan National Central High School, the school offers a variety of solid waste management programs and activities such as, but not limited to, the activities conducted by YES- O, DOYSC, Science Club, and other club organizations. Hence, the provisions of the R.A. 9003 are indirectly implemented. However, these solid waste management activities and programs are strictly implemented and followed only when there are school-initiated events, parent-teacher association (PTA) meetings, school celebrations, school assessments, and visits from other stakeholders, including higher authorities. When these activities are implemented, the school continues its regular waste management practices. Thus, this requires the sustainability of these practices and programs to achieve the provisions of the Ecological Solid Waste Management Act of 2000 (R.A. 9003).

Similarly, the researcher recognizes that the school encounters various challenges during the implementation process, which must be identified to assess the effectiveness of the measures in place. The effectiveness of these measures is not solely determined by regulatory compliance but also by addressing the issues that affect their successful implementation. Therefore, compliance with regulations alone is not a comprehensive indicator of their effectiveness in achieving the intended objectives.

Though there are already studies on waste management available on an international, national, and local level. However, there are only a few studies that determine the problems encountered in the implementation of R.A. 9003 in the education sector. With these, the researcher saw a gap that needs to be filled to address the issue of waste management. Thus, the researcher prompted his interest in conducting a study that determines the problems encountered in the implementation of R.A. 9003 in Narvacan National Central High School. It is then believed that through this study, the researcher hopes to develop a comprehensive solid waste management plan that strengthens the implementation of the provisions of the Ecological Solid Waste Management Act of 2000 (R.A. 9003).

LITERATURE REVIEW

The implementation of the Ecological Solid Waste Management Act (RA 9003) in Philippine schools has faced numerous obstacles despite its legal requirements. A study by Romualdo et al. (2022) evaluated the incorporation of solid waste management (SWM) practices in both public and private schools in General Santos City. The results showed that while these schools implemented SWM measures to some extent, challenges such as inadequate infrastructure, limited resources, and inconsistent enforcement hindered full compliance with the law.

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The study emphasized the need for continuous advocacy, adequate funding, and institutional support to improve SWM efforts in schools.

Similarly, a study by Alburo (2021) explored students' awareness and engagement with their school's implementation of RA 9003. The findings suggested that although students were moderately aware of waste management practices and engaged in waste segregation, issues such as the lack of proper segregation tools and limited recycling programs made it difficult to achieve effective waste management. This study highlighted the importance of better infrastructure, consistent waste management practices, and more comprehensive educational campaigns.

In Agusan del Norte, a study on the Ecological Solid Waste Management Program in elementary schools identified both successes and challenges. While schools engaged in waste minimization, segregation, recycling, and composting, issues such as insufficient facilities, limited resources, and inconsistent enforcement affected the program's overall effectiveness. The study recommended strengthening institutional support, increasing resource allocation, and encouraging community involvement to improve the success of the program.

These studies collectively underscore the importance of addressing infrastructural limitations, resource constraints, and the need for consistent enforcement to effectively implement R.A. 9003 in Philippine schools. Enhancing institutional support, improving facilities, and fostering community involvement are crucial steps toward achieving the law's objectives in the educational sector.

Research Questions

This study aimed to determine the problems encountered in the implementation of the Ecological Solid Waste Management Act of 2000 (R.A. 9003) in Narvacan National Central High School.

Specifically, it sought answers to the following questions:

1. What are the problems encountered in the implementation of the Ecological Solid Waste Management Act of 2000 (R.A. 9003) in Narvacan National Central High School?

What comprehensive solid waste management plan can be proposed to address the findings of the study?

Scope and Limitation

The scope of the study determined the problems encountered in the implementation of the Ecological Solid Waste Management Act of 2000 (R. A. 9003) in Narvacan National Central High School. Students, janitors, parents, teachers and school heads were the participants in this study.

This study utilized a Qualitative-Descriptive research method, which aimed to generate data that describe the 'who, what, and where of events or experiences' from a subjective perspective (Perez et al., 2022; Dela Cruz & Aquino, 2023). In the present study, it determined the problems encountered in the implementation of the Ecological Solid Waste Management Act of 2000 (R. A. 9003) in Narvacan National Central High School.

RESEARCH METHODOLOGY

a. Sampling

Purposive sampling was employed in the selection of the key informants. According to Kyngas et al. (2021), purposive sampling is the most commonly used method in content analysis studies. In purposive sampling, the researcher aims to communicate with individuals who possess the most knowledge about the subject of the study. The main interviewed key informants for this research encompassed a diverse group within the school community, namely students, janitors, parents, teachers, and school heads. They were selected as key informants due to their roles and knowledge regarding waste management practices within the school setting. Students, particularly student leaders, often play a crucial role in promoting environmental initiatives among their peers. Teachers, as integral members of the educational system, are expected to have a comprehensive understanding

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of waste management practices and can offer valuable insights into their implementation in schools. Janitors, who are involved in the day-to-day operations and maintenance of the school, are likely to have firsthand experience with the practices involved in waste management. School heads, as administrators, are responsible for overseeing and ensuring the proper implementation of policies and initiatives, including waste management. A total of 30 key informants were included. However, data saturation was achieved with the 17th key informant, though interviews continued to gather additional valuable insights.

b. Data Collection

To obtain the necessary data, the researchers prepared an interview guide questionnaire, which underwent validation by four (4) research experts and one (1) language expert, resulting in a validity index of 4.98, described as 'Very Highly Valid". Following the validation, the interview guide questionnaire underwent pilot testing administered to the three teachers from Narvacan National Central High School.

After pilot testing, the researchers made necessary preparations for the face-to-face interviews with the key informants. The researchers gathered the key informants and provided them with a proper orientation regarding the interview's purpose for the completion of the research. Subsequently, the researchers handed the written consent forms to the key informants for review. They were also asked to indicate their approval or rejection of participating in the interview. Once their consent was obtained, appointments were scheduled based on their availability. Additionally, they were prompted to choose a location where they would feel more at ease and undisturbed. This allowed the researchers to create a friendly atmosphere that inspired the key informants to go in detail with their narrations. To catch any crucial details that might have been missed during the process, all of the interviews were videotaped using a smartphone with the consent of the key informants. Note-taking was employed to record non-verbal responses. The recorded responses were transcribed and checked by the key informants for confirmation if everything was taken correctly. After that, the key informants were asked to sign the transcribed verbatim after reading and checking their responses. The data collected were interpreted to make a conclusion.

c. Ethical Issues

Since the study needed the participation of human respondents, various ethical considerations were made to make sure the study would be carried out properly. To protect the key informants' privacy and safety, the researchers took into account certain ethical considerations. The researchers went over all the pertinent information about the study, including its goals and objectives, to get the key informants' agreement. The relevance of their contribution to the completion of the research was made clear to the key informants by elaborating on these crucial points. By withholding their names from the research, the key informants' privacy was also guaranteed. Only pertinent information that aided the researcher in addressing the research questions was provided.

d. Plan for Data Analysis

Content analysis was employed to organize and elicit meaning from the data collected and to draw realistic conclusions from it. According to Clootrack (2023), content analysis is an effective tool used by researchers to identify patterns, themes, and relationships within a set of data. It is used to identify the presence of particular words, phrases, and other content elements.

In the present study, the following steps of content analysis were employed. Firstly, the researchers initiated the process by transcribing all the interviews, turning spoken words into written text. Subsequently, specific portions of text for analysis, such as sentences or paragraphs, were identified. Clear criteria, such as responses that addressed the research question, were established for selecting and analyzing the chosen text unit. Following that, categories or themes were developed to capture key concepts from the data. The researchers then refined and confirmed these categories based on the actual content. Finally, the researchers applied the categories to the text, analyzed their distribution, and interpreted patterns.

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To ensure the validity and reliability of the findings, the researchers sought inputs from research experts who reviewed the coding scheme and analysis. The feedback provided by the experts was included.

DISCUSSION OF RESULTS AND RECOMMENDATIONS

Problems Encountered in the Implementation of the Ecological Solid Waste Solid Waste Management Act of 2000 (R. A. 9003) in Narvacan National Central High School. As to the problems encountered by the school in the implementation of the Ecological Solid Waste Solid Waste Management Act of 2000 (R. A. 9003) in Narvacan National Central High School, responses taken from students, janitors, parents, teachers, and school heads were varied. However, the findings shed light on the predominant problems encountered by the school in implementing the R. A. 9003. These problems encompass a wide range of areas, including lack of awareness and knowledge, lack of discipline, supervision deficiency, limited funding and resource allocation, deficient community modeling, lack of coordination, and insufficient collaboration.

Lack of Awareness and Knowledge. The lack of awareness and knowledge refers to a state in which an individual or a group of people is uninformed or unaware of a particular subject or a range of topics. Based on the interviews with the key informants, it was highlighted that a common issue was the lack of awareness and knowledge among students and staff regarding proper waste management practices, including segregation, reduction, reuse, recycling, and disposal. This problem was supported by the following significant statements shared by the participants:

First is the lack of socio-environmental knowledge among students due to their lack of orientation related to solid waste management (P1).

The first reason is the lack of awareness and knowledge among students and staff about proper ways of segregating, reducing, reusing, and recycling waste (P2 & P13).

This problem is not solely attributed to teachers; it is also influenced by the way education is delivered (P3).

This is the worst, the lack of knowledge about the Republic Act 9003. The Ecological Solid Waste Management Act is not emphasized or introduced. They do not really know the contents of Republic Act 9003 (P4).

These findings suggest that inadequate awareness and understanding of waste management within the school community is a significant issue. This challenge mirrors the struggles experienced by the Hambantota Municipal Council (HMC) in Sri Lanka, where insufficient information about the negative effects of solid waste hampers effective waste management. Additionally, poor waste management practices in the community are compounded by a lack of education on environmental matters. Therefore, educating the public on proper waste management is crucial for sustainable environmental development (Key Research Findings and Recommendations, 2021).

As educational institutions serve as platforms for disseminating knowledge on waste management, it is essential for schools to ramp up their efforts in environmental education campaigns. Education plays a vital role in raising public awareness about environmental protection, which is key to achieving effective waste management (Azevedo et al., 2023; Kadambini & Yashwanth, 2022). According to Kumar et al. (2022), education is crucial for gaining knowledge, transforming attitudes, and developing skills related to resource management, including waste management. Furthermore, education is a key solution to the waste problem, as it fosters greater environmental awareness and helps formulate sustainable development strategies (Rahman & Alam, 2021).

Similarly, environmental education is critical in ensuring that students gain the necessary knowledge and cultivate a positive attitude toward waste management (Mendoza et al., 2023). Kuo et al. (2021) highlight that improving environmental knowledge enhances awareness of better waste management practices. On the other hand, a lack of awareness and environmental knowledge hinders effective waste management, leading to long-term issues for future generations (Buchanan et al., 2023). Additionally, insufficient strategies for sharing information about solid waste management can lead to reduced public awareness and participation in waste management programs (Santos et al., 2024).

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Lack of Discipline. The lack of discipline means a situation in which individuals or groups do not adhere to established norms, guidelines, or codes of conduct, resulting in disorder, noncompliance, or inappropriate behavior. Based on the interviews, it was evident that the lack of discipline posed a challenge in the implementation of the Ecological Solid Waste Management Act of 2000 in the school community. This issue became apparent through the responses provided by the key informants:

Second, the lack of discipline primarily concerns the segregation of waste and dumping. Despite having trash cans in each classroom, some students, even though the cans are labeled, still place their garbage in other bins. Although they are aware it should be placed there, they still dispose of their garbage elsewhere (P11).

One of the main reasons is that students lack discipline. Despite our efforts to keep the school clean, there are still individuals who persist in improper disposal. (P3).

I think the issue lies in the discipline among students. They no longer pay attention to the labels on the trash. Sometimes they just throw their garbage anywhere (P15).

These accounts highlight the need for a more holistic approach—one that not only builds awareness but also strengthens students' discipline. Langco (2024) emphasized that sustainable waste management is more effective when individuals develop responsible habits and discipline in handling waste. Likewise, Antonio (2023) reported that the Department of Science and Technology (DOST) has promoted mindset and behavioral change among Filipinos to strengthen waste segregation and disposal efforts.

Discipline plays a foundational role in shaping effective learning environments. Singh (2023) noted that disciplined learners exhibit better self-control, which can influence their choices—including environmentally responsible behavior. Gordon's classroom management theory supports the idea of fostering open, respectful student-teacher relationships that empower students to take charge of their actions (Study.com, 2022). Educators are encouraged to apply this theory to promote accountability and autonomy among learners, especially in behavior involving shared responsibilities like waste management.

Moreover, PubGenius Inc. (2023) emphasized that self-discipline in managing waste not only promotes ecological preservation but also improves efficiency in waste sorting and recycling. It encourages practices such as material reuse, selective sorting, and proper treatment of waste, thereby reducing the demand for new resources and supporting long-term sustainability.

Supervision Deficiency. A supervision deficiency refers to a circumstance or state in which there is insufficient supervision, monitoring, or management of a certain activity, process, or group of people. During the interview, a deficiency in supervision became evident within the school community. This issue was strengthened by the responses shared by key informants.

Some teachers, though not all, trust their students to dispose of their trash without ensuring it is done properly. They do not check whether the waste has been appropriately disposed of or if it has been segregated correctly. Supervision and monitoring are lacking in these cases (P3).

I mean is a lack of supervision or monitoring (P1 & P12).

The solution lies in close monitoring and effective implementation, requiring good supervision (P3).

These responses suggest that the absence of regular supervision contributes to the inconsistent enforcement of solid waste management practices in schools. This situation is further compounded by the overwhelming workload that public school teachers face. Teachers are burdened with numerous responsibilities aside from their primary teaching duties, leaving little room for actively supervising environmental initiatives such as waste segregation.

Recognizing this issue, the Department of Education (DepEd) issued DepEd Order No. 2, s. 2024, which mandates the removal of non-teaching administrative tasks from teachers to allow them to focus on instruction and classroom-related responsibilities (Department of Education, 2024a). Similarly, DepEd Order No. 5, s. 2024,

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seeks to rationalize teachers' workload by promoting equitable distribution of teaching assignments and ensuring fair compensation for teaching overload (Department of Education, 2024b).

These policy efforts are further reinforced by the recent statement of DepEd Undersecretary Michael Poa, who emphasized that reducing paperwork by 57% would allow teachers to concentrate more on instruction and less on clerical tasks (Hernando-Malipot, 2025). However, despite these initiatives, many teachers still struggle with managing multiple programs and responsibilities. As a result, school-level supervision, particularly in areas like waste management, remains inconsistent and often neglected.

The lack of focused supervision in this context not only impedes the school's ability to meet the goals of the Ecological Solid Waste Management Act but also weakens the development of a culture of environmental responsibility among learners. Without consistent monitoring and teacher involvement, learners are less likely to internalize proper waste practices. Therefore, fostering a sustainable school environment requires a multifaceted approach—one that includes structured monitoring systems, targeted training, and a clear delineation of responsibilities, especially as it relates to waste management and environmental initiatives.

Limited Funding and Resource Allocation. Limited funding and resource allocation refer to a situation where there is a lack of sufficient financial resources and allocated materials to effectively implement the mandated waste management practices.

Further, this constraint encompasses inadequate budgetary provisions for crucial aspects such as infrastructure development, personnel training, and the establishment of recycling facilities. It results in a restricted ability to carry out comprehensive waste segregation, recycling, and disposal initiatives, thereby impeding the school's compliance with the environmental regulations outlined in R.A. 9003. In support of these, the following responses were generated during the interview:

The second reason is the inadequate equipment and facilities for collecting, storing, and disposing of waste materials (P2).

The lack of machinery is another issue (P3).

Fourth is the lack of technological advances. We don't have machines to convert recyclable materials into more useful ones (P4).

These findings reflect the struggles faced by many schools in developing countries in securing the necessary tools and resources for effective solid waste management systems. Debrah et al. (2021) highlighted that schools in underdeveloped nations lack the tools to build an efficient waste management infrastructure. Similarly, Boateng et al. (2023) observed that both urban and rural schools in Ghana face resource deficits in managing waste effectively, calling for better funding and infrastructure.

Moreover, the lack of financial and technological resources remains a significant challenge to sustainability in waste management. Larson et al. (2023) emphasized that insufficient funds and technology are key obstacles, alongside issues like awareness gaps and a lack of support for capacity-building efforts. Yusofi (2021) also pointed out that inadequate access to proper facilities, lack of treatment programs, and insufficient infrastructure planning undermine waste management efforts in many developing countries.

Hence, effective waste management requires adequate funding to cover various tasks, such as constructing recycling facilities, purchasing necessary equipment, operating services, training staff, and engaging in planning and administrative activities. Without sufficient resources, schools in developing countries struggle to implement long-term waste management initiatives, resulting in ineffective waste management practices.

Deficient Community Modeling. Deficient community modeling refers to a situation where there is an inadequacy of positive examples, behaviors, or role models within a local community. This issue was further supported by the statements of the key informants during the interview, underscoring the community's impact on improper waste management.

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People sometimes imitate what they see around them (P3).

So, we have to accept the reality that in their homes they throw their garbage everywhere or even in their backyard (P6 and P14).

Some parents dispose of their waste improperly, and their children carry these habits to school (P8).

These insights resonate with recent studies that underscore the importance of community involvement and positive role models in promoting sustainable waste management practices. For example, a study conducted in 2025 examined how effective community engagement strategies are vital for achieving sustainable waste management goals. Similarly, another 2025 study highlighted the critical role of local champions and social media in influencing waste management behaviors, showing that local figures who promote eco-friendly practices can inspire others to follow their example.

Additionally, these findings emphasize the need for a comprehensive approach to waste management that includes not just efforts within schools but also extends to the community. Effective interventions should involve partnerships between schools, local communities, and government bodies to create a unified approach to sustainable waste management.

Lack of Coordination and Insufficient Collaboration. Collaboration involves minimal individuals or institutions working together synergistically to achieve a common goal, while coordination entails insufficient planning and organizing actions to guarantee efficiency and effectiveness in reaching a specified goal. Both of these issues are observed in the implementation of the provisions of the Ecological Solid Waste Management Act of 2002, as supported by the responses obtained during the interview.

The second issue is the lack of support coming from our colleagues. Therefore, we really need to ensure that both our colleagues and the administration provide support so that we can achieve our goal. In fact, a teacher notices plastic bottles in his yard but still does not pick them up (P4).

Despite our collaboration with the LGU, their garbage collection schedule of twice a week was insufficient (P3).

There is no memorandum of agreement (P4 and P7).

There is a further gap between the school organization and the environmental institutions (P1 and P5).

These issues highlight the difficulties in achieving effective cooperation among the various stakeholders involved in waste management efforts. Factors such as fragmented strategies, conflicting interests, and inadequate communication channels hinder the efficient and coordinated execution of waste management practices required by law. The absence of a unified approach, combined with poor mechanisms for information-sharing and coordination, results in duplicated efforts, gaps in implementation, and an inability to address all aspects of waste management comprehensively.

Recent studies have pointed to fragmented institutional structures, poor coordination among stakeholders, and a lack of public engagement as significant barriers to effective solid waste management. These barriers contribute to inefficiencies, duplicated efforts, and a lack of accountability in waste management services. Additionally, challenges such as unclear roles, inadequate enforcement, and insufficient coordination among stakeholders further undermine the effectiveness of integrated waste management practices.

The importance of collaboration among stakeholders in overcoming these challenges has also been emphasized. By fostering collaboration, sharing resources, and promoting innovation, stakeholders can improve waste management practices. To tackle these issues, it is essential to clarify roles and responsibilities, enhance communication channels, and encourage collaboration across all sectors involved in waste management. Implementing these measures can lead to more effective and sustainable waste management outcomes.

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Proposed Comprehensive Solid Waste Management Plan for Narvacan National Central High School

Rationale

The rapid growth of solid waste, driven by rising populations, urbanization, and changing consumer behaviors, is a critical environmental issue. This escalating problem harms ecosystems and human health, with the United Nations Environment Programme (UNEP, 2021) highlighting the strain it places on global waste management systems.

In the Philippines, particularly in urban areas, solid waste management continues to be a significant problem. Improper waste disposal, inefficient waste collection, and a lack of disposal facilities are among the country's major concerns in solid waste management. However, several measures have been put in place to address this issue, including waste management policies outlined in the Ecological Solid Waste Management Act of 2000. But then, even at the barangay level, the implementation of these policies has always been challenging.

Schools generate significant waste daily, primarily food, paper, plastic, and packaging. Research shows 30% of school waste is food, which can be composted or used in sustainability projects (Md Zain et al., 2023). In the U.S., public schools produce about 14,500 tons of waste daily, with 42% from food packaging (Zhang et al., 2022). Programs like Chicago Public Schools' initiative to divert 80% of cafeteria waste and Spanish schools' food waste reduction efforts highlight the effectiveness of targeted sustainability actions (Chicago Public Schools, 2021; Gallo & Villafañe, 2021). Universities are also adopting sustainable waste management systems to support broader goals (Usman et al., 2024). These efforts underline the importance of integrated environmental strategies for schools to meet sustainability targets.

At Narvacan National Central High School, various waste management programs are implemented by organizations like YES-O, DOYSC, and the Science Club. However, these activities are mostly enforced during school events, PTA meetings, and visits from higher authorities, suggesting a need for more consistent and sustainable practices to fully comply with the Ecological Solid Waste Management Act of 2000 (R.A. 9003). The researcher acknowledges challenges in implementing these measures and emphasizes that regulatory compliance alone does not guarantee their effectiveness.

It is, therefore, vital to continue sustaining waste management activities and programs for the preservation and protection of the environment. Furthermore, the public must be made aware of the various wastes produced by schools and how to appropriately separate them for disposal, reuse, or recycling. However, implementing a thorough solid waste management system is doubtful without incorporating a diverse variety of stakeholders and encouraging public-private partnerships. That's why the plan emphasizes the importance of participation and collaboration for the success of all efforts. These principles are anchored in shared responsibility, good governance, and participation, social and environmental justice, with people at the core of conservation, protection, and rehabilitation, and development initiatives. Additionally, as emphasized in the 1987 Philippines Constitution, Article II, Section 16, the state shall protect and advance the right of the people to a balanced and healthful ecology in accordance with the rhythm and harmony of nature.

By utilizing the key findings of the study and the data gathered through interviews, the researcher developed the Comprehensive Solid Waste Management Plan for Narvacan National Central High School. The plan underwent validation from three (3) research experts, one (1) language expert, and one (1) solid waste management officer, receiving an overall weighted mean of 4.98, indicating Very High Validity. This result suggests that the proposed Comprehensive Solid Waste Management Plan for Narvacan National Central High School can serve as a framework for solid waste management in alignment with the provisions of the Ecological Solid Waste Management Act of 2000 (R.A. 9003). Additionally, the comprehensive plan incorporates the recommendations provided by the validators, emphasizing the need for adequate resources for the planned events.

The plan consists of the following parts: title, rationale, general objectives, specific objectives, and the Comprehensive Solid Waste Management Plan matrix. Specifically, the title of the plan on solid waste management is Comprehensive Solid Waste Management Plan for Narvacan National Central High School. The title suggests a specific and focused approach to addressing the issue of solid waste management at Narvacan

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National Central High School. Furthermore, the rationale of the plan outlines the reasons for offering it. The general objectives refer to the overall objectives of the plan. On the other hand, the specific objectives detail the particular goals of the Comprehensive Solid Waste Management Plan. The matrix shows the graphical content of the plan on solid waste management and includes concerns, specific objectives, activities, timeline, key persons, logistics needed, and means of verification (MOVs).

The concerns identify the issues that need to be addressed regarding the problems encountered by the school in implementing the Ecological Solid Waste Management Act of 2000 (R.A. 9003). Each component consists of specific objectives that specify the strategic goals to be achieved. The activities as reflected in the plan are the specific actions to be performed to attain specific objectives. Also, the timeline is the same as the indicative date of implementation of the different activities. Moreover, the key persons refer to the people who are essential in carrying out the activities. Additionally, logistics refers to the resources needed for the implementation of an activity. Furthermore, the means of verification are a list of documents that show the school's attainment of objectives.

General Objectives

Solid waste management in schools is a learning tool that teaches students about various types of garbage, how each type may be recycled, and how waste can be used effectively. In addition to instilling good hygiene habits in children, this program encourages them to become more analytical thinkers and teaches them how to work together in small groups to safeguard others from hazardous trash. Hence, the comprehensive solid waste management plan helps the school manage its waste production while promoting a responsible waste management culture among students. Additionally, it helps the school community grow in love and awe of God's creations.

This Comprehensive Solid Waste Management Plan aims to:

1. Facilitate recycling and correct onward disposal;
2. Minimize school waste production;
3. Increase the life of school resources;
4. Enhance waste diversion and foster innovative and sustainable solutions to manage waste; and,
5. Improve health standards through proper waste disposal.

Specific Objectives:

With the full implementation of the Comprehensive Solid Waste Management Plan, the schools are expected to:

1. Ensure that schools are environmentally sustainable;
2. Provide actions to avoid and minimize the generation of waste;
3. Promote the effective delivery of waste services in schools;
4. Encourage public participation and behavior change;
5. Maintain eco-friendly routines and practices at home, at school, and during extra-curricular activities;
6. Effectively carry out activities and programs;
7. Exemplify the school waste management plan's five guiding principles;
8. Work with the local government and the school's sponsors to ensure that SWMP procedures are adhered to;

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9. Demonstrate a constructive attitude toward criticism by being willing to put suggestions and recommendations into practice to enhance their routines and practices; and,

10. Integrate environmental awareness in the learning curricula and extracurricular activities, emphasizing the value of the school waste management plan.

Table 1. Matrix of the Comprehensive Solid Waste Management Plan for Narvacan National Central High School

Concern	Specific Objectives	Activities	Timeline	Key Person	Logistics Needed	Means of Verification (MOVs)
Lack of Awareness and Knowledge **Goal:** To inform and educate individuals, communities, or organizations about the principles, practices, and importance of effective waste management.	To raise awareness about the environmental, social, and economic impacts of improper waste disposal, and to equip people with the knowledge needed to make informed decisions on waste reduction, recycling, and sustainable waste management practices.	Reach More-Learn More Campaign Workshops Seminars Webinars Community Outreach Programs.	Year Round	MENRO Representative School Technical Working Group School SWM Committee School SWM Coordinator SSLG/ YES-O/ DOYSC Homeroom/ Club Officers	Sound system Projector LED TV Php. 10,000/ year (MOOE, Local School Funds)	Approved proposal on the conduct of workshops, seminars, webinars, and community outreach programs. Attendance Record Picto-Narrative Report Monitoring and Evaluation report Certificate of Participation
		Info- Sharing Campaign Flyers Pamphlets Brochures Posters Online content	Year Round	MENRO Representative School Technical Working Group School SWM Committee School SWM Coordinator SSLG/ YES-O/ DOYSC Homeroom/ Club Officers	Php. 15,000/ year (MOOE, Local School Funds)	Approved proposal on the distribution of informative materials, including flyers, pamphlets, brochures, posters, and online content. Attendance Record Picto-Narrative Report Monitoring and Evaluation report Utilization of the school FB page School internet subscription
Lack of Discipline **Goal:** Establish and promote a structured and systematic approach to waste management practices.	To instill discipline among individuals, communities, or organizations in handling waste in a manner that is environmentally sustainable, socially responsible, and compliant	I am a Hero" Incentive Giving Program Rewards	Year Round	School Technical Working Group School SWM Committee School SWM Coordinator SSLG/ YES-O/ DOYSC Homeroom/ Club Officers	Php. 5,000/ year (MOOE, Local School Funds) Donations	Action Plan Accomplishment Report Attendance of participants Certificate of participation and recognition

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	with relevant regulations.			Bids and Awards Committee (BAC)		
		Waste Wise Workshop	Year Round	MENRO Representative School Technical Working Group School SWM Committee School SWM Coordinator SSLG/ YES-O/ DOYSC Homeroom/ Club Officers Parents/ Guardians	Sound system Projector LED TV Php. 25,000/ year (MOOE, Local School Funds)	Approved proposal on the conduct of workshops to train individuals, community members, and organizations on conducting effective waste audits. Attendance Record Picto-Narrative Report Monitoring and Evaluation report Certificate of Participation
		Be an Agent of Change Activity Impose disciplinary measures	Year Round	School Head • SSLG School SWM Committee School SWM Coordinator Guidance counselor/ Guidance Teachers	None	Record book of violations Functional disciplinary committee
Supervision Deficiency **Goal:** To ensure effective oversight and management of waste-related activities.	To maintain a high level of efficiency, compliance with regulations, and environmental sustainability in handling waste.	Waste Rangers in Action Waste management monitoring	Year Round	MENRO Representative School Head School QATAME (Quality Assurance, Technical, Assistance, Monitoring, and Evaluation) Coordinator SWM Coordinator SSLG/ YES-O/ DOYSC Advisers Teachers Classroom officers	None	Action Plan Functional School Waste Management team
Limited Funding and Resource Allocation **Goal:** To secure and allocate financial	To address the waste management lifecycle, from collection to disposal, in a manner that promotes	Strategic Treasure Hunt Fund allocation	Year Round	School Head Supply Officer SWM Coordinator SSLG/ YES-O/	None	Approved budget and financial plan Inventory Report Annual procurement plan of the school

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resources and other necessary means to support effective waste management initiatives.	sustainability, minimizes environmental impact, and meets regulatory requirements.			DOYSC Advisers		
Deficient Community Modeling **Goal:** To leverage the power of social influence within a community to promote positive behaviors and practices related to waste management.	To foster a sense of shared responsibility, cooperation, and a cultural shift toward sustainable waste management practices at the community level.	Eco-Pioneer Talks Symposium	Year Round	MENRO Representative School Technical Working Group School SWM Committee School SWM Coordinator SSLG/ YES-O/ DOYSC Local Volunteers	None	Approved proposal on the conduct of symposium. Attendance Record Picto-Narrative Report Monitoring and Evaluation report Certificate of Participation
Lack of Coordination and Insufficient Collaboration **Goal:** To enhance the effectiveness of waste management efforts through the systematic coordination and collaboration of various stakeholders.	To optimize resource utilization, share expertise, and jointly address the challenges associated with waste generation, collection, recycling, and disposal.	EcoSort Elevation Symposium	Year Round	MENRO Representative School Technical Working Group School SWM Committee School SWM Coordinator SSLG/ YES-O/ DOYSC Local Volunteers	Sound system Projector LED TV Php. 10,000/ year (MOOE, Local School Funds)	Approved proposal on the conduct of symposium and orientation on categorizing and disposing of waste correctly. Memorandum of agreement between LGU and private sector. Attendance Record Picto-Narrative Report Monitoring and Evaluation report Certificate of Participation
Evaluation **Goal:** Enhance resource efficiency, minimize environmental impact, and ensure long-term viability in addressing solid waste challenges.	To assess the effectiveness and sustainability of waste management systems.	Periodic Assessment	Year Round	MENRO Representative School Technical Working Group School SWM Committee School SWM Coordinator SSLG/ YES-O/ DOYSC	None Php. 5,000/ year (MOOE, Local School Funds)	Monitoring and Evaluation report

Summary

This study aimed to determine the problems encountered in the implementation of the Ecological Solid Waste Management Act of 2000 (R. A. 9003) in Narvacan National Central High School. The participants for this

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research encompassed a diverse group of six individuals, representing various roles within the school community, namely student leaders, janitors, and teachers. The Qualitative- Descriptive research method was utilized in this study.

The following were the salient findings of the study:

1. The study revealed several problems in the implementation of the Ecological Solid Waste Management Act of 2000 (R.A. 9003) within the school. Firstly, it brought to light a lack of knowledge and awareness among members of the school community regarding proper waste management. This was followed by a noticeable issue with discipline concerning waste management practices. Additionally, deficiencies in supervision related to waste management activities were identified. Moreover, the community lacks figures or instances that would serve as positive models for shaping and supporting efforts to adhere to waste management regulations. The research also highlighted a challenge in the limited availability of funds and resources allocated to solid waste management initiatives. In the same vein, collaboration is limited, with minimal involvement of individuals or institutions working synergistically to achieve the common goal outlined in the Act. Additionally, there is a notable deficiency in coordination, characterized by insufficient planning and organization of actions, leading to a lack of efficiency and effectiveness in reaching the specified goals of the Act. These findings collectively underscore the multifaceted nature of challenges that need attention for the development of a comprehensive and effective solid waste management system within the school.

2. The proposed Comprehensive Solid Waste Management Plan for Narvacan National Central High School is “Very Highly Valid” with an overall weighted mean of 4.98.

Based on the findings of the researcher, the following conclusions were derived:

1. The school faces various problems in the implementation of the Ecological Solid Waste Management Act of 2000 (R.A. 9003), including a lack of knowledge and awareness, lack of discipline, supervision deficiency, limited funding and resource allocation, deficient community modeling, lack of coordination and insufficient collaboration.

2. The proposed Comprehensive Solid Waste Management Plan for Narvacan National Central High School holds great potential as a solid framework for waste management.

IMPLICATIONS AND RECOMMENDATIONS

1. The school is encouraged conduct awareness campaigns to educate the broader community, involving students in outreach programs to spread information about proper waste management practices.

2. The school is advised to strengthen and enforce disciplinary measures within the school to ensure compliance with waste management regulations.

3. The school is urged to enhance supervision mechanisms to ensure that waste management practices are consistently followed across all school activities. strengthen and enforce disciplinary measures within the school to ensure compliance with waste management regulations.

4. The school is recommended foster collaboration and coordination among various stakeholders, including teachers, students, parents, local authorities, and waste management agencies.

5. The school encouraged to periodically assess the effectiveness of implemented measures through audits, surveys, or feedback mechanisms and use the findings to make necessary adjustments and continuously improve the school's waste management practices.

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