

**SOLID WASTE MANAGEMENT PRACTICES AND AWARENESS ASSESSMENT  
OF DIGOS CITY**Allen Christy C. Melendrez  
John Jelbert L. Gan  
Joel S. Pardillo

---

**ABSTRACT**

Solid waste management and disposal is one of the major problems most of the cities are facing nowadays. If such problem continues over time and not addressed, it may eventually lead to negative impact to the environment and may also increase the number of extinct fauna. (Suleman Y, Darko ET, Agyemang-Duah W, 2015). With a total population of approximately 169,393 in 2015, Digos City is one of the most densely - populated cities outside Davao City (Regional Development Council, Davao Region, 2015). Hence, the ongoing development with a goal in making it into a trading center and an alternative settlement of Davao City is a great challenge to the local government units in maintaining a clean and healthy city for its citizens. Over 150 respondents from different sectors including households, schools both public and private, hospitals, businesses and commercial establishments, private offices and local government offices, gave their time to answer the survey questionnaires and interviewed representatives in each sector to gather information on the knowledge and practices respondents have on solid waste management. The main focus of the research project is first, to bring into the community awareness of the current situation of the Solid Waste Management of Digos City and its serious and adverse effects to the human health and environment. Second is to discuss possible solutions or strategies to address the current problems and issues of the solid waste in accordance to the Ecological Solid Waste Management Act of 2000. Third, to encourage community participation and cooperation to battle against solid waste problem for a better place to live. The inefficiency and unsustainable solid waste management of the local government is not only an environmental issue but also an economical, societal, and political issue. The challenges of managing solid waste will continue to be an issue if not taken into consideration and immediate attention by the local officials.

**Keywords:**

Solid Waste Management Program, Material Recovery Facility, Sanitary Landfill

---

**INTRODUCTION**

Improper solid waste disposal is a major problem around the world. Based on the report from the World Bank, a person generates 1.2kg of solid waste and is expected to increase by 2025 to 1.5kg per person. (Rinkesh, 2015). With these continuing problems and lack of proper strategies and solutions, these may lead to negative effects to the environment. It is already evident with the increased number of animals that were affected, especially the sea creatures since most of the solid waste ends up in the ocean if not properly managed.

Waste production is a serious environmental problem across the City of Digos. Practicing efficient and sustainable solid waste management of the local government of Digos is a big challenge to the new administration. Due to economic development and increase in population that contributed to the increase in the volume of solid waste generation leading to the greater demand for solid waste management services seeks immediate attention from the government and the general public as well. It is one of the priorities of the new administration to promote the preservation, protection and revival of the ecosystem through prevention, control and abatement of air, water and land pollution and the spread of hazardous wastes in the environment. This situation calls for a participatory management approach where the roles and responsibilities in managing solid waste must be shared between the government and its citizen. Citizen's participation can greatly contribute to the success of government in managing efficient and sustainable solid waste management of the entire City of Digos.

Today's City Solid Waste Management in Digos has evolved into a modern state of the art technology, Open dumpsite has been closed and replaced by a sanitary landfill with gas-control and leachate-collection system along with the existing established Material Recovery Facility that processed different types of waste streams. While all of these changes have been very beneficial to the society and to the environment, these have been resulted in an increase in operating cost. The costly construction of sanitary landfill and additional equipment and manpower will surely have an impact in the fund allocation of the local government of Digos.

Over 150 participants from different sectors including households, schools both public and private, hospitals, business and commercial establishments, private offices and local government offices, gave their time to answer the survey questionnaires and interviewed representatives in each sector to gather information on the knowledge and practices by respondent on solid waste management. The main focus of the research project is first, to bring into the community awareness of the current situation of the Solid Waste Management of Digos City and its serious and adverse effects to the human health and environment. Second is to discuss possible solutions or strategies to address the current problems and issues of the solid waste in accordance to the Ecological Solid Waste Management Act of 2000. Third, to encourage community participation and cooperation to battle against solid waste problem for a better place to live.

To be effective and successful in managing solid waste, the City Government of Digos must be competent in three areas: first is technology, second is implementation of regulations, and the third is effective communication. In the present situation, only technology has been established but not effective communication and as well as regulation implementation. These three areas in managing solid waste can be in comparison to the three legs on a stool. Without these three legs, the stool will fall over and cannot stand on its own by using only one leg. The City Government must be able to effectively communicate to its citizens and at the same time must have the technical and regulatory knowledge to develop efficient and sustainable solid waste system. If the City government failed to implement regulations and convey such information and the general public fails to understand and follow regulations, then the project in effective solid waste management will not be effectively implemented.

The assessment and result of the study on the different sectors of the City of Digos helps create guidelines that would not only improve the existing Solid Waste Management Program of the city but as well as to serve as a basis for the other establishments and institutions in all municipalities of the Province of Davao del Sur in creating their own sustainable and efficient program in Solid Waste Management.

#### OBJECTIVES

This study sought to determine the solid waste management practices and level of awareness of the different sectors in Digos City, Philippines.

Specifically, it aimed to:

- To identify the current issues and problems of the city on the solid waste management.
- To assess the solid waste management practices of the different sectors of the city and community participation for a sustainable and efficient solid waste management program implementation.
- To enumerate the strategies for the effective and efficient implementation of the Solid Waste Management Program in Digos City.

#### METHODOLOGY

**Research method.** The study utilized purposive sampling method to gather data from different sectors of the community of Digos City. This study made use survey questionnaires, interviews, document review analysis and observations to obtain data concerning the solid waste management in the City of Digos. The data gathered from the survey questionnaires were used to generate graphs and charts by analysis and interpretations. Simple percentage was calculated to describe the profile of the respondents as to gender, age and educational level as well as type of employment. All data gathered were based on the answers from the interviews, survey questionnaires and meeting with different sectors of the community.

**Focus Group Discussion (FGD).** Focus group discussion participants were the barangay captains, Assistant Schools Division Superintendent, City Divisions Solid Waste Management Focal Person, School Heads and School PTA Presidents of public and private elementary and secondary schools, School Solid waste management Coordinators, Environmental Student Organizations( e.g. YES-O) coordinators, including junkshop operators were gathered together in the presence of the City Mayor to discuss the topic on solid waste management practices in Digos City. This focus group discussion was conducted last August 13, 2019 at Ramon Magsaysay Central Elementary School of Digos City.

**Document Review Analysis.** In a study involving the gathering information by examining and reviewing records, published and unpublished materials including journal and online articles. Public document related to city environment was obtained from the office of the City Mayor and from the Office of City Environment and Natural Resources Office.

**Key Informants (KI) Interviews.** It is a face-to-face interview with the respondents conducted with the selected industries such as business establishment owners, household residents, government and private employees, school heads, teachers and PTA presidents in both private and public schools, junkshop operators and even college students as well as street sweepers and garbage collectors. These key informants were chosen based on their big participation and involvement in the City's Solid Waste Management being implemented in the city. Thus, it was assumed that they would be the best sources of information of personal experience in the implementation of the said program.

#### **RESULTS AND DISCUSSION**

Demographic data refers to the data expressed statistically which includes socio-economic characteristics on selected population such as age, sex, education level, income level, occupation, religion of the people within the population. The demographic data included in this study were respondents' profile, type of ownership, type of occupation, level of education and types of wastes.

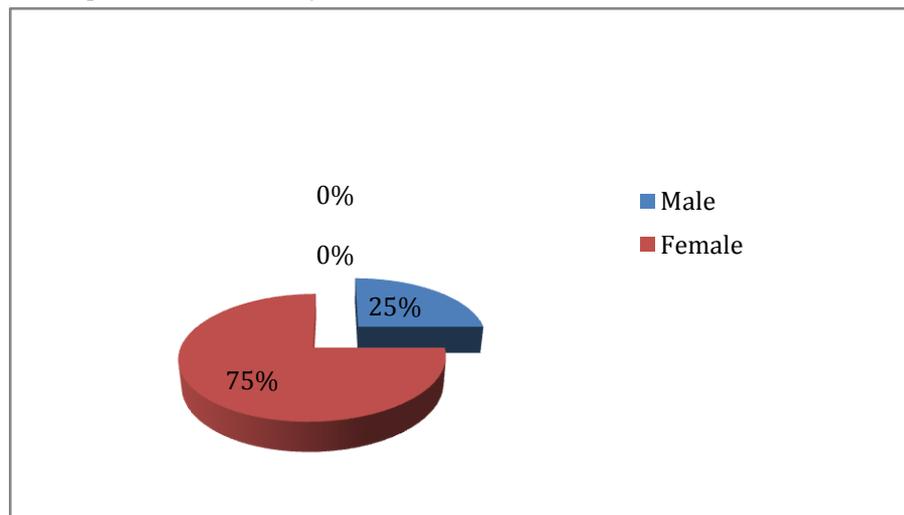
#### **Response Rates on Questionnaire and Interview Guide**

The study had a high response rate from the respondents' questionnaires. There was a 100% return of questionnaires and almost 90% of questions in the interview were answered from the respondents. Only few questions were not addressed due to cases of non-applicability. The researcher assisted the respondents in Digos City to fill the questionnaires to ensure positive responses from the respondents.

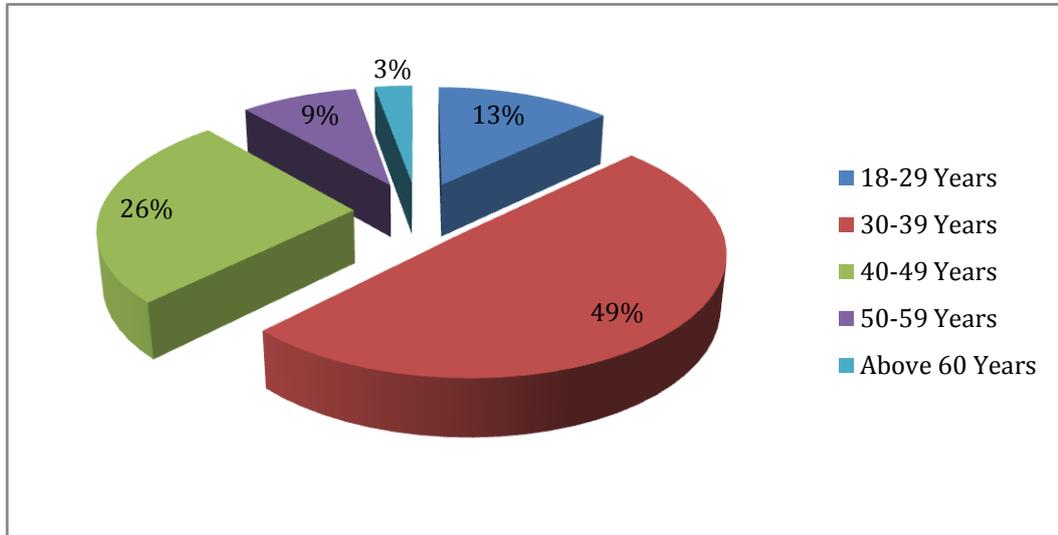
#### **SOCIO-DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS**

##### **Sex Distribution (Field Survey, 2019)**

More than half of the respondents were mostly female (75%) and 25% were male.

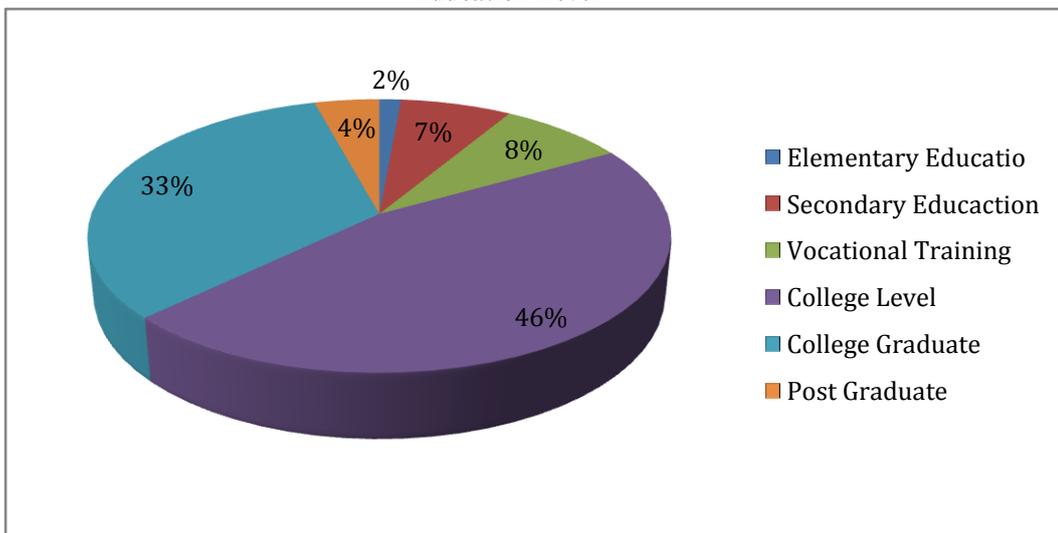


**Age Distribution ( Field Survey 2019)**



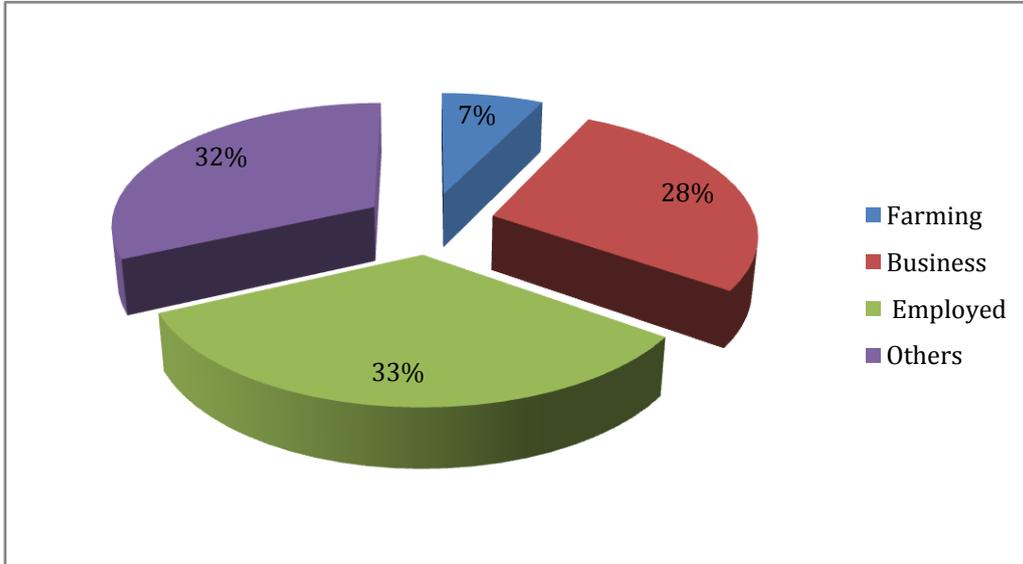
Among the respondents of the study, majority of the respondents of the study, 100% were on the adult category. 49% were between 30-39 years, 26% were between 40-49 years, and 13% were 18-29 years, and another 9% between 50-59 years. The researcher also indicated that there were 3% of the respondents who were above 60 years as shown in the chart.

**Education Level**



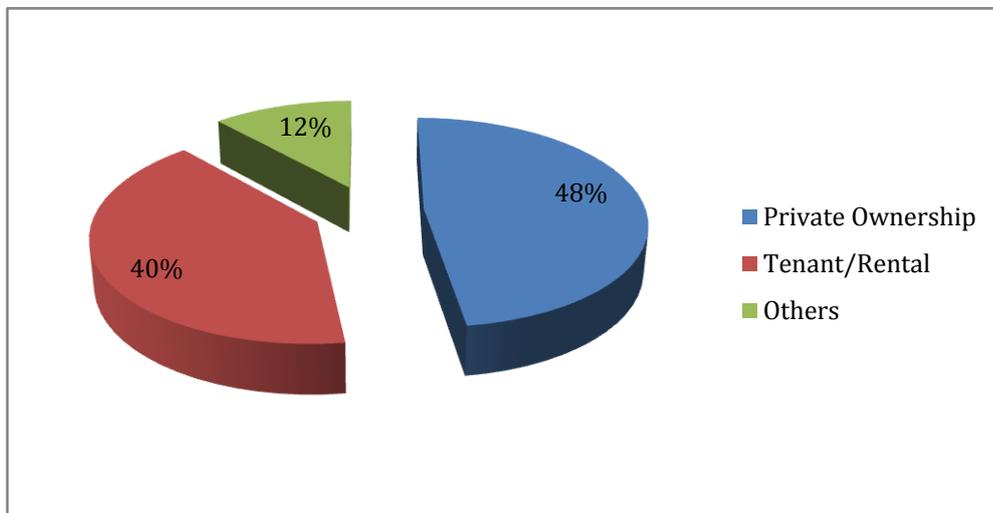
The study indicated that 46% were college level, 33% were college graduate, 8% were vocational trainees, 7% had finished secondary education and 4% were post graduates while 2% had elementary education.

**Occupation of Respondents**



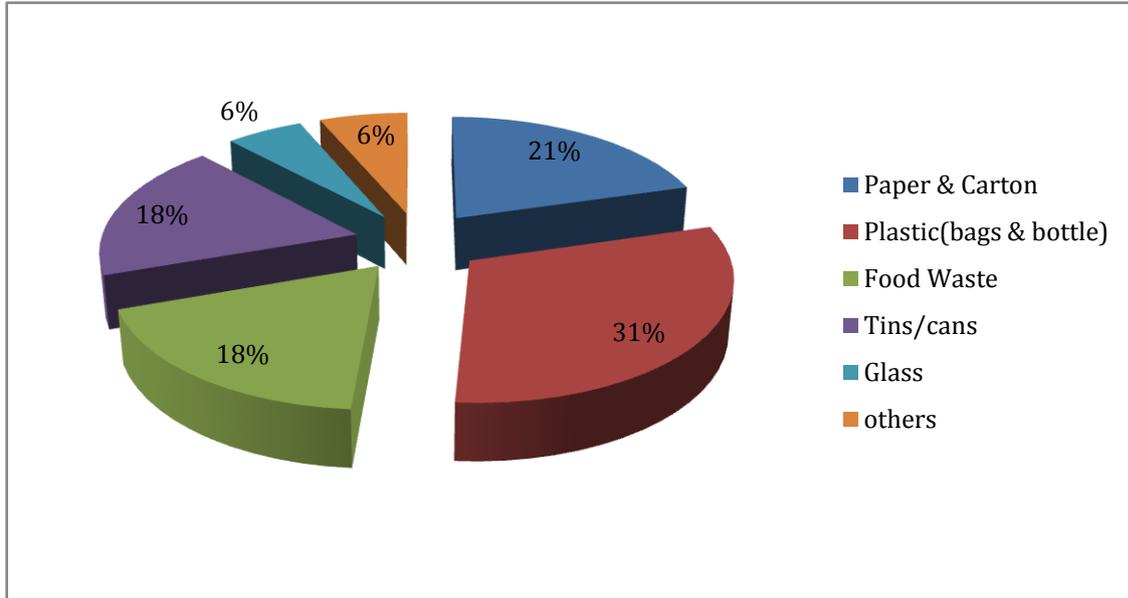
The research indicated that about 33% of the respondents were employed, 32% were engaged in business or entrepreneurship activities and 28% were in farming while there were 7% of respondents who were not in any form of employment.

**Type of Premise Ownership**



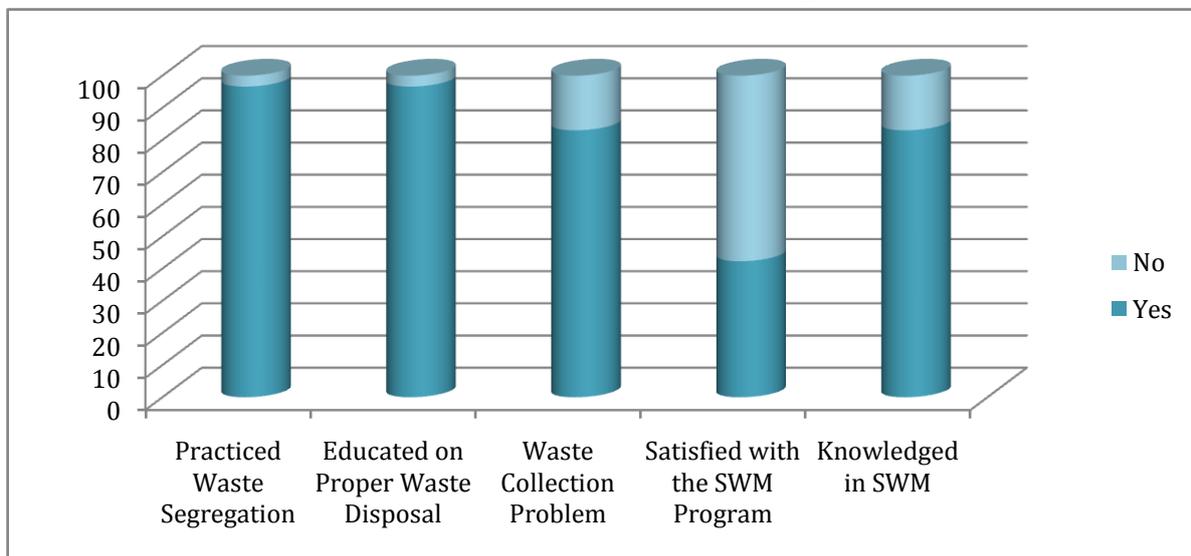
The research indicated that 48% of the resident respondents were privately owned the premises and 40% were tenants or rented and 12% of the respondents were not in any form of ownership. In this case, it can affect management of the solid waste since the responsibility of managing the solid waste is between the landlords and the tenants of the premise while the remaining 12% respondents have different arrangements in managing their solid waste.

Waste Generation (Field Survey, 2019)



As shown above figure, the research indicated that there were different types of waste generated and characterization by the respondents. About 31% were plastics generated by the respondents, 21% were Paper and carton, 18% food waste, 18% tins/cans, 6% glass, and 6% were other wastes generated.

Level of Awareness on Solid Waste Management



The research findings indicated that most of the respondents have higher level of awareness in terms of knowledge in waste segregation, practice in waste segregation, waste collection problem and their satisfaction level with the solid waste management program implementation of the local government of Digos.

**DISCUSSION**

According to the respondents which are the households, offices, businesses and schools, the following are the enumerated issues and problems on the solid waste management program in Digos City:

- Waste segregation in the garbage collection system.
- Waste segregation was done in household, offices, business establishments and school level but no segregation was done when wastes were loaded to garbage trucks.
- Lapses in garbage collection system causes confusion and discouragement to the community who are trying their best efforts in practicing on proper waste segregation.
- Most of the barangays exercise loose implementation of solid waste management program.
- Out of 26 barangays, only 1 barangay has established material recovery facility and collection system
- No collaborations of barangays with other institutions with regards to Solid Waste Management implementation.
- Almost all schools and establishments have no material recovery facility.
- Lack of technical knowledge of RA 9003

**These are the common Solid Waste Management Practices of different sectors of the City based on the study conducted:**

- Non-compliance of RA 9003 in barangay level;
- No functional Barangay Solid Waste Management Committee;
- The absence of operational equipment intended for Solid Waste Management purposes at barangay level;
- The absence of material recovery facility in different sectors of the community and as well as in Barangays;
- The ineffective implementation and enforcement of environmental laws, regulations, and ordinances by local authorities;
- No schedule of separate collection for biodegradable and non-biodegradable waste;
- Inefficient Collection system, while transportation of waste continued to be mixed.

**Based on the Focused Group discussion, these are the suggested strategies for effective and efficient Solid Waste Management implementation:**

- The local government shall have to exert more effort and commitment in the implementation of sustainable and efficient solid waste management in the city.
- The Re-organization of Solid Waste Management Committee in all 26 Barangays of Digos City;
- The formulation of Solid Waste Management Plan in Barangays and also in different sectors of the community such as schools, subdivisions, business establishments and even markets ;
- Establishment of the Barangay, School-Based and Community-Based Solid Waste Management Program Collaboration and Partnership;
- Organization of Junkshop Operators in Digos City;
- Continuous Evaluation and monitoring of the Solid Waste Management practices of the entire City of Digos by the local officials and the CENRO in particular;
- Creation and launching of School Eco-Savers Club;
- Establishment of Barangay, Subdivision, Market, Community and School Material Recovery Facilities including composting and Eco- Centers through the Financial assistance of the LGU;
- Schedule of Separate Garbage collection system for Biodegradable, Non-Biodegradable Waste and Residual Waste;
- Introduce an innovative technique in Eco-Bricking for students activities in school for waste diversion purposes;
- Continue Strengthening the information dissemination, education campaign in each barangays, schools and other sectors of the community;
- Formulate City Ordinances pertaining to the strict implementation of proper Solid Waste Management Program in accordance to RA 9003..

# IJETRM

## International Journal of Engineering Technology Research & Management

### CONCLUSIONS

Although RA 9003 emphasizes the waste diversion schemes such as waste segregation, reuse, recycling and composting, it seems that less participation from the general public was observed and was difficult for the government to implement in spite of higher level of awareness on solid waste management among the respondents of this research because of the existing issues, problems and practices of solid waste management in the community. Based on the findings of the research, the different issues, problems and practices of the community on the solid waste management can be given solution through the application of the suggested strategies for the efficient, effective and sustainable Solid Waste Management Program of the City of Digos.

### REFERENCES

- [1] Suleman, Y., Darko, E.T., Agymang-Duah, W., 2015, Solid Waste Disposal and Community Heathy Implications in Ghana: Evidence from Sawaba, AsakoreMampong Municipal Assembly, Journal of Civil and Environmental Engineering: Open Access.
- [2] Bhada-Tata, P., Hoorweg, D., What a Waste: A Global Review of Solid Waste Management, 2012, March, No. 15, The World Bank.
- [3] Updated Davao Region Physical Framework Plan 2015-2045, Regional Development Council Davao Region, December 15, 2015, Davao City.
- [4] Digos City Ecological Solid Waste Management 10-Year Plan 2018-2023.