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Original Research Article

Perceived Impacts of a Community-Based Solid Waste Management Initiative in Santa Cruz, Laguna, Philippines

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Abstract

This study analyzed the perceived social impacts of Basura Mo, Edukasyon Ko, a community-based environmental program in Santa Cruz, Laguna, Philippines. This program encourages student-beneficiaries and their families to collect and segregate single-use plastic and receive monetary incentives upon submission to the program implementers, the local government of Santa Cruz, Laguna. Implemented for seven years now, the program has helped thousands of students in the municipality. One hundred twenty-one program beneficiaries were study respondents and two implementers were key informants. Responses were analyzed using thematic analysis. Results showed that the Program produced social, environmental, economic, and political impacts that positively affected the lives of the respondents, their families and their respective communities. These include the development of social responsibility and improved social ties, environmental protection and resource conservation, increased community engagement, and reduced household expenses on education. Despite these positive impacts, the program implementation faced several challenges, limited financial resources and no monitoring and evaluation mechanisms. Furthermore, it also needs to improve its planning and implementation of activities, consultation with the beneficiaries, distribution of the grant, and communication of the program requirements to the present and future beneficiaries. This way, the sustainability of the program may be ensured.

Keywords— program evaluation, perceived social impact, social impact assessment, solid waste management

1 Introduction

Between the 1970s and the 1990s, production of plastic tripled compared to the last two decades [1]. This can be attributed to the characteristics of the invention being lightweight, highly durable, flexible, and cheap to produce, creating a market for its various uses [2]. However, with the exponential growth of usage and production, the generated waste has become unmanageable, and studies of plastic pollution have been recorded as early as the 1960s [3, 4].

On a global scale, over 450 million tonnes of plastic waste are produced yearly, with 50% coming from single-use plastics, mostly from packaging. Alarming, only 9% is recycled, while millions of tonnes of mismanaged waste spills into land and water, adversely affecting ecosystems. The data from the World Population Review shows that China, the United States, and India are the top 3 producers of plastic waste in the world [5].

In the Southeast Asian region, the Philippines ranked third in having the most mismanaged plastic waste generated, significantly contributing to marine pollution [6]. The Global Alliance for Incinerator Alternatives (GAIA) reports that single-use plastics like sachets account for 50% of the country's plastic waste [7]. This is due to the heavy reliance of Filipino consumers on sachet products, which have been an integral part of their daily lives due to their convenience and affordability [8, 9]. Unfortunately, 20% of these wastes end up in bodies of water, causing pollution and contamination of the water and sea life and clogging waterways, contributing to flash floods [7].

To address the country's growing problems with waste management, environmental degradation, and pollution, RA 9003, or the Ecological Solid Waste Management Act of 2000, was implemented. This provided the policy framework and institutional mechanisms that mandate local government units to establish solid waste management plans and reduce municipal solid waste by 25% [10]. In compliance, various national and regional efforts are continuously implemented nationwide. As per the 2023 performance audit report of the Commission on Audit, 520 out of 591 sample LGUs have Segregation-at-Source Ordinance. The National Solid Waste Management Commission (NSWMC) 2020 also released Resolution No. 1380, Series of 2020, or the guidelines prescribing the color coding of waste bins or bags according to their classification to help stakeholders at the barangay level improve the handling and managing of waste. Although concerned agencies and the LGUs implement continuous efforts, the report highlights that robust and collective action is still required to address the challenges prompted by the increasing trend of waste generation and to progress in attaining its goals and objectives [11].

Aside from the government, non-government organizations also play a role in reducing waste. In several areas across NCR, Regions IV-A, VII, and XI, Friends of Hope Inc. implemented a community-based initiative focused on RA 9003 in partnership with local government units, communities, and the Plastic Credit Exchange (PCX), starting in 2020. The Aling Tindera program involved women micro-entrepreneurs, particularly sari-sari store owners, serving as community aggregation hubs for post-consumer plastic waste, which could then be sold to PCX. This initiative aims to engage the community, systematize plastic waste recovery, provide incentives, and promote proper waste management practices [12].

In a similar effort, the municipality of Santa Cruz, Laguna, implements the *Basura Mo, Edukasyon Ko* Program that addresses local waste issues, specifically regarding retrieval and diversion, while providing scholarships to financially constrained students. This program started in 2017 and continues until now. Program beneficiaries also increased through the years. Thus, it is essential to analyze the impacts of the program. As noted by Tabo et al. [13], there is a need to conduct an impact assessment on development programs implemented by LGUs to ensure that these initiatives are effectively implemented. Conducting an assessment can also help identify whether the programs address community problems and meet the needs of the community. These data support the decision-making process for a program's sustainability.

Existing literature on solid waste management in the Philippines predominantly emphasizes

compliance with RA 9003, challenges in its implementation, and levels of public awareness and practices of the 3Rs (reduce, reuse, and recycle) [14, 15, 16, 17]. While these studies report on the regulatory and operational challenges of RA 9003, the social dimensions of solid waste management interventions are often overlooked. Notably, limited research examines how community-based programs impact the social aspect of beneficiaries' lives, particularly in local contexts. Thus, this study aimed to assess the perceived social impacts of the *Basura Mo, Edukasyon Ko* Program among the participants. Specifically, the study sought to:

- (1) describe the *Basura Mo, Edukasyon Ko* Program and the program's beneficiaries;
- (2) discuss challenges and opportunities in the program implementation;
- (3) analyze the perceived impacts of the program on the beneficiaries; and
- (4) formulate recommendations to address the limitations of the program and to improve its impacts further.

By adopting a holistic perspective, this research aims to contribute to the growing interest in impact assessments, emphasizing their role in promoting program sustainability and supporting sustainable development. It also seeks to understand how interventions produce intended and unintended impacts, influencing different aspects of beneficiaries' lives.

Table 1. Distribution of respondents based on their barangay of residence

| Barangay | Frequency (n=121) | Percentage (100%) |
|---------------------|------------------------------|------------------------------|
| Bagumbayan | 9 | 7 |
| Bubukal | 4 | 3 |
| Calios | 5 | 4 |
| Duhat | 1 | 1 |
| Gatid | 16 | 13 |
| Jasaan | 1 | 1 |
| Labuin | 6 | 5 |
| Oogong | 3 | 2 |
| Pagsawitan | 13 | 11 |
| Palasan | 4 | 3 |
| Patimbao | 18 | 15 |
| Poblacion I | 2 | 2 |
| Poblacion II | 1 | 1 |
| Poblacion III | 1 | 1 |
| Poblacion IV | 3 | 2 |
| San Jose | 2 | 2 |
| San Juan | 3 | 2 |
| San Pablo Norte | 4 | 3 |
| San Pablo Sur | 4 | 3 |
| Santisima Cruz | 6 | 5 |
| Santo Angel Central | 9 | 7 |
| Santo Angel Norte | 3 | 2 |
| Santo Angel Sur | 3 | 2 |
| Alipit | 0 | - |
| Malinao | 0 | - |
| Poblacion V | 0 | - |

2 Methodology

Santa Cruz is a first-class municipality and the provincial capital of Laguna. Based on the 2020 Census report of the PSA [18], the municipality houses a total of 122,309 population, making the population density 3,169 inhabitants per square kilometer. Approximately 18% of the municipality's total population belongs to the age group of 15-24 years old, which includes most undergraduate students typically aged 18-22 years old [19]. Furthermore, the beneficiaries came from 23 different barangays out of the 26 barangays of the municipality. Table 1 presents the distribution of participants based on their barangay of residence.

The *Basura Mo, Edukasyon Ko* Program serves approximately 3,000 student beneficiaries in Santa Cruz, Laguna, for the school year 2023-2024. In this study's context, a total of 121 beneficiaries participated. This sample size was determined using non-random sampling techniques, which were considered suitable for the study given its scope and limitations outlined in the following discussion. Regarding the composition of the respondents, 58% are 22-25 years old, while 38% are 18-21, and only 4% belong to the 26-29 age range. In terms of sex, 68% are female, while 32% are male. Regarding the duration of participation in the program, 86% have been beneficiaries for three to four years, some (12%) for five to six years, while only a few (2%) have been part of it for over six years. Based on their status as a program beneficiary, i.e., past or current, more than half (69%) are current beneficiaries, while only 31% are past beneficiaries. Of the past beneficiaries, 34 have graduated from college, one has a postgraduate degree, and the three reached college level at the time of the study.

Table 2. Summary of the demographic profile of the respondents.

| Socio-Demographic Characteristics | Frequency Count (n=121) | Percentage (%) |
|--|-------------------------|----------------|
| Age | | |
| 18-21 | 46 | 38 |
| 22-25 | 70 | 58 |
| 26-29 | 5 | 4 |
| Sex | | |
| Male | 39 | 32 |
| Female | 82 | 68 |
| Number of years of being a beneficiary | | |
| 3-4 years | 104 | 86 |
| 5-6 years | 15 | 12 |
| More than 6 years | 2 | 2 |
| Status as a program beneficiary | | |
| Current beneficiary | 83 | 69 |
| Past beneficiary | 38 | 31 |
| Highest Educational attainment of past beneficiaries | | |
| College level | 3 | 8 |
| Undergraduate degree | 34 | 89 |
| Postgraduate degree | 1 | 3 |
| Household size | | |
| Less than 4 members | 6 | 5 |
| 4 to 6 members | 90 | 74 |
| 7 to 10 members | 23 | 19 |
| More than 10 members | 2 | 2 |
| Monthly Household Income | | |
| Less than ₱9,100 | 61 | 50 |
| ₱9,100 to ₱18,200 | 45 | 37 |
| ₱18,201 to ₱36,400 | 12 | 10 |
| Above ₱36,400 | 3 | 3 |

The respondent's household size varied, with 74% having a household size of four to six members, 19% having 7 to 10 household members, 5% having less than four members, and only 2% having more than 10. Regarding household income, half (50%) of the respondents belong to a household whose income is less than ₱9,100, while 38% have a household income of ₱9,100 to ₱18,200. Furthermore, 10% of the respondents belong to a household whose income is ₱18,201 to ₱36,400, and only 2% have a household income above ₱36,400. Table 2 presents the summary of the composition of the respondents.

This study employed a qualitative approach using a case study design [20] to determine the impacts of the *Basura Mo, Edukasyon Ko* Program. The case study as an approach enables a thorough understanding or exploration of complex issues in their natural context [21, 22]. In the study's context, the approach facilitated the collection of diverse perspectives on the program's impacts through interviews with key informants and surveys of the beneficiaries. Through this, participants' lived experiences and perceptions were gathered, which provided the researcher with a better understanding of the phenomenon under study. In collecting the data, an online self-administered survey instrument was disseminated to program beneficiaries through the social media platform Facebook from February 06, 2024, to March 3, 2024. The municipal administrator also endorsed the study on the program's official Facebook page for a wider reach. Purposive sampling was used to select participants, ensuring they had been part of the program for at least three academic years. This helped guarantee that respondents had sufficient knowledge and experience to discuss the program's implementation and its impacts. In addition, the snowball technique was used to reach the target respondents as the program's implementing body did not allow the researcher to obtain the contact information of the beneficiaries due to the Data Privacy Act.

On the other hand, an interview guide was utilized during the face-to-face key informant interview (KII) conducted with the two representatives from the program implementers. Key informants include individuals who have been actively involved in the program implementation. The guide included questions about the interviewee's profile and the program.

Descriptive statistics and thematic analysis were used to satisfy the objectives of this study. Specifically, frequency counts were used to determine the distribution of the respondents. The open-ended questions, on the other hand, were analyzed using thematic analysis that helped identify patterns in the statements of the respondents and aided the researcher in producing the themes that captured the participants' responses.

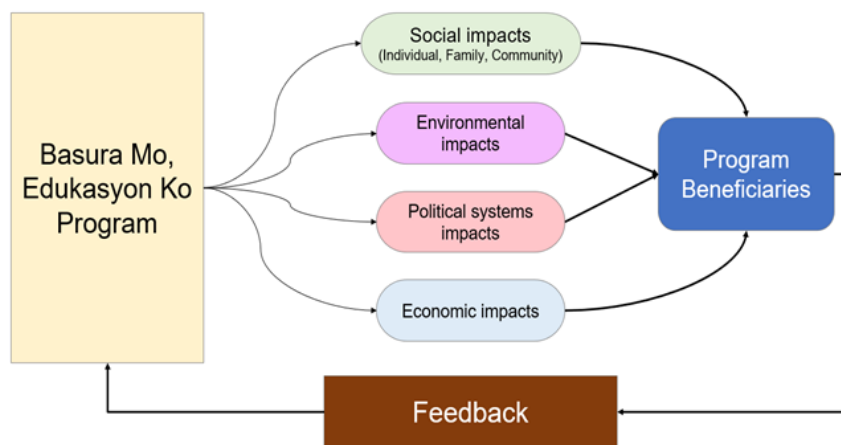


Figure 1.
Conceptual Framework of the Study

Figure 1 presents the relationship of the variables related to this study. It can be seen in this framework that the implementation of the *Basura Mo, Edukasyon Ko* Program produced social, environmental, political systems, and economic impacts that affected the program beneficiaries' lives. Furthermore, it also shows that feedback from the program beneficiaries directly affects the program implementation. For a deeper context, social impacts refer to changes in individuals, families, and communities' behavior (knowledge, attitude, practices), access to education, quality of life, and social ties. On the other hand, environmental impacts pertain to the changes in the natural and built environment, specifically in terms of cleanliness and sanitation and exposure to flood risk caused by the program. Political system impacts refer to the beneficiaries' participation level as municipality members. Lastly, economic impacts are about the changes in the finances of the program beneficiaries' lives.

The findings of this study are significant and beneficial to organizations and local government units (LGUs) that plan to implement similar programs. The results may also contribute to the academic literature on the social impacts of a community-based waste initiative. Additionally, this research offers valuable insights for future scholars interested in conducting Social Impact Assessments (SIAs) on ongoing programs, providing additional views on the advantages and disadvantages of the process to improve the methodology of conducting an SIA.

Finally, the researchers ensured that the study adhered to ethical standards for research involving human participants. Before conducting the study, a courtesy call was made to the municipal administrator of Sta. Cruz, Laguna, Philippines, to seek approval. Afterward, a request letter was sent to the key informants seeking their participation. Informed consent with voluntary participation and confidentiality clauses was also provided to both the key informants and respondents. Data collection began only after consent was received.

Although undergraduate research is not required to undergo review by the Research Ethics Board, the researchers ensured that the study adhered to ethical standards for research involving human participants. The co-authors and the department's research and instruction committee rigorously reviewed the research methodology before implementation.

3 Results and Discussion

3.1 Description of the program and the program's beneficiaries

The *Basura Mo, Edukasyon Ko* Program is an initiative implemented by the Local Government of Santa Cruz, Laguna. Initiated by the late mayor, Hon. Dennis G. Panganiban, in 2017 and continued by Mayor Edgar "Egay" San Luis during his term in 2019, the program aims to help the municipality divert waste from landfills and provide financial assistance to its beneficiaries. Over its seven years, the program has been managed by the Municipal Environment and Natural Resources Office (MENRO) and the Local Youth Development Office (LYDO), working closely with the Mayor and Municipal Administrator's Office. To understand the characteristics and composition of the program beneficiaries, below is a discussion of the criteria used by these bodies in beneficiary selection:

Under the implementation of MENRO, the criteria for selecting the program beneficiaries included the place of residence, current educational level, and academic standing. Specifically, the characteristics of the beneficiaries are:

1. bona fide resident of Santa Cruz, Laguna;
2. either a senior high school or college student; and
3. has a minimum average of 85 in all their courses or subjects.

In 2023, the program implementation was transferred to the LYDO. As the successor, the office adopted some beneficiary selection criteria and adjusted a few. Considering this, the beneficiaries under the implementation of LYDO have the following characteristics:

1. bona fide resident of Santa Cruz, Laguna;
2. either a senior high school or college student;
3. belongs to a low-income household;
4. have no failing grades in their courses or subjects; and
5. not a recipient of any other financial assistance program implemented by the Sta. Cruz LGU.

3.2 Challenges and opportunities in the program implementation

Challenges encountered by the program implementers

Grievances of the program beneficiaries. Both departments faced challenges in addressing the program beneficiaries' grievances. The most common complaint was the difficulty beneficiaries had collecting the required amount of plastic. The second issue involved the location of drop-off points plastic turnover. Although additional venues were assigned to remedy this, their reservation-based availability made it difficult for the implementers to assign these as regular pick-up points. This led to confusion among program beneficiaries, causing them to go to the wrong location and miss their turnover schedule.

Low-level engagement of program beneficiaries. The *BasuEskolar* Program, a waste-diversion initiative by the municipality of Santa Cruz, aims to divert high amounts of plastic waste from sanitary landfills and to partner companies to be used as raw materials. With program beneficiaries' low participation, the program has experienced drawbacks as the mentioned goal has not been met, leading to increased landfill waste and higher tipping fees. As an outcome, more budget is allocated for tipping fees that could have supported more citizens from other programs of the LGU.

Non-compliance of some program beneficiaries with program requirements. The implementers aim to educate participants on the importance of proper waste management through the *Basura Mo, Edukasyon Ko* Program. However, although the program specifies that only household wastes should be submitted, some beneficiaries are submitting plastic waste purchased from a nearby factory instead. This has become a challenge mainly because the essence of the program to begin segregation at the source level is not being achieved, and the factory's responsibility to dispose of their waste correctly is being transferred to the LGU.

Additional hauling expenses for waste diversion. Waste diversion reduces the volume of waste sent to and processed by sanitary landfills. This helps extend its operational life and minimizes the need to create a new one. For non-recyclables, diverting waste to companies for co-processing is one of the ways for them not to end up in landfills. Through a Memorandum of Agreement, the municipality of Santa Cruz, with MENRO, partnered with Republic Cement & Building Materials, Inc. and CEMEX Philippines to receive the diverted plastic waste. However, only CEMEX Philippines has agreed to provide hauling services to assist in waste transportation to their facility. In contrast, Republic Cement & Building Materials, Inc. could not provide the same assistance, requiring the municipality to transport it directly to their facility. Given the department's limited resources, prioritization of diverting the waste to CEMEX Philippines happens and only, if possible, to Republic Cement & Building Materials, Inc.

Unpredictability of weather conditions that cause activity cancellation. The scheduled turnover highly depends on the weather forecast; the activity will push through only if the weather is predicted to be sunny. This means that the activity will be postponed indefinitely if the forecast indicates a high chance of precipitation. One reason is that plastics must be dry before weighing to ensure accurate volume records. Additionally, partners may reject wet plastics as they are not qualified for co-processing. This has become a challenge since the turnover occurs in an open space at the municipal plaza.

Inability to accept additional scholars due to budgetary constraints. Starting from a few hundred scholars, the program grew and caters to approximately 3,000 scholars. The increase in numbers

is attributed to the program's growing recognition and the rising demand for educational assistance across the municipality. Despite accepting more applicants, many students still express their interest in joining the program due to the increasing prices of commodities. Unfortunately, the department's current resources restrict its operation. Reducing the current amount of financial assistance to accommodate additional beneficiaries could also not be considered as it will be too little to aid current beneficiaries in their needs. If left unaddressed, these challenges pose a significant risk to the program's long-term sustainability. Unresolved grievances and low participation can lead to disengagement, which impacts the program's ability to achieve its objectives. The unpredictability of weather and non-compliance with waste submission requirements also hinder the program's effectiveness in waste diversion. Furthermore, the financial constraints limit the program's scale and capacity to support additional beneficiaries.

As per the findings of Inocencio [23] in her examination of the issues in implementing and managing community-based tourism development programs in the Province of Biliran, it is essential to deal with program implementation challenges to ensure program success. With this, implementers can address identified challenges through better coordination, consistent planning, and increased financial resources.

Challenges encountered by the program beneficiaries and their suggestions for improvement

Many (71%) of the respondents encountered challenges in the activities relevant to the program. Some (29%), however, reported no challenges. Those who encountered difficulties were asked to identify the activities involved and to elaborate on their experiences. In addition, respondents' perceptions on how to manage these challenges were also requested.

The first activity under the program involves the application process, in which applicants submit their requirements to the MENRO for verification. They then take a qualifying examination covering RA 9003, the municipal ordinances on SWM and smoking, and personal information. The officiating office releases the list of beneficiaries through their Facebook page. Below are the challenges encountered by the program beneficiaries.

Non-inclusiveness of the program. The context of inclusivity here pertains to leaving no one behind. In the context of potential beneficiaries, it is essential to note that the only way for applicants to be part of the program is by applying through the said activity. Hence, it is important to participate in it. However, with the application schedule being conducted on a weekday, respondents expressed that it was challenging as their classes coincided with the activity's schedule. The event led some students to skip their classes so they could submit their application requirements.

Apart from the schedule, beneficiaries also perceived that the qualifying exam limits the program's reach, stating that the exam defeats its purpose of involving more young people in the efforts to take care of the environment through waste diversion.

Lack of knowledge regarding the SWM laws and ordinances. As the contents of the qualifying examination concentrate on SWM, respondents pointed out their struggle due to their lack of knowledge and familiarity with the scope of the topic, especially Republic Act 9003.

Inadequate dissemination of program information. The main channel used by the implementing office to communicate with their program beneficiaries is through their Facebook page. However, although announcements were published, respondents shared that announcements often lacked clarity, brewing confusion. Apart from this, program beneficiaries also face difficulty when the department suddenly announces changes in the details (e.g., dates, time, and location of activity) of the activity.

Below are the respondents' suggestions on how the implementers can improve the effectiveness of the activity.

Program inclusivity. Respondents suggested scheduling the activity on weekends to avoid conflicts with their classes and enhance inclusivity. Some recommended removing the exam from

the application process to increase the opportunities for applicants to join the program.

Contents of the exam. As per the respondents, providing an examination scope can help applicants prepare for the activity. Respondents also believe that the department and the municipality should improve their promotion of proper SWM by increasing the availability of educational materials in schools and public places. This can increase the familiarity and knowledge of applicants and the public regarding SWM as well as the efforts of the municipality toward it.

Information dissemination. Respondents suggest that the implementers maximize their social media accounts by ensuring transparent and detailed announcements. They believe the platform should be used to communicate changes regarding the program to avoid confusion.

The next activity is the program orientation, during which program objectives, beneficiary responsibilities, and other relevant details are discussed. For the past years, orientations were held onsite over two days per cluster, with morning and afternoon sessions to accommodate the large number of scholars.

Non-inclusiveness of the program. Like the previous activity, the second activity also faces scheduling issues that impact beneficiary participation. This challenge can prevent participants from being informed about the program as program information is detailed during this activity.

Inconsistencies in program information. All details shared during the orientation are considered final unless otherwise stated. However, inconsistent information about the grant amount confused beneficiaries in this program. Some respondents pointed out that they were told they could receive ₱5,000 as financial assistance upon completing their requirements. On the other hand, some participants were informed they could get ₱3,000 per semester. In the end, some respondents shared that only a total of ₱3,000 was disbursed for the academic year.

Inadequate program information dissemination. Under this theme, program beneficiaries struggled with two main challenges: incomplete program information and disorganized communication of announcements. Respondents noted that the orientation did not explain how cash assistance would be distributed or specify the department's target timeline for disbursement (e.g., every end or start of the semester). Moreover, as per the study participants, the department, once again, failed to release clear announcements regarding the orientation activity.

Lack of proper planning and poor implementation of the activity. Some of the factors the implementers failed to consider for the on-site conduct of the activity are the program length, venue, number of expected participants, and the time to conduct the activity, resulting in a disorganized activity. For instance, the program's duration was extended as it did not start on time. Respondents also pointed out mismatches between the venue and the number of attendees, leading to some students not having seats throughout the program. Other beneficiaries also became exposed to the sun during morning and afternoon sessions. The discomfort affected participants' concentration and attention, with some deciding to leave early and not finish the activity. The overall result reflects the lack of preparation of the officiating department, which needs to be improved next time.

Another aspect to be considered for an ongoing program during the planning phase is the frequency of meetings with the beneficiaries for discussion or updates regarding the program. Respondents shared that one of the challenges they faced was forgetting the program details, as the last orientation they attended was quite a while. In addition, as the frequency of the activity is not predetermined (e.g., quarterly, every semester), beneficiaries often cannot recall if their batch had an orientation. These challenges may impact the program and lessen the scholars' engagement.

Below is the summary of the respondents' suggestions for activity improvement.

Inconsistencies in the program information. Respondents suggested that implementers finalize all information regarding the program before releasing it to the public so confusion about the

program details can be prevented.

Information dissemination. Respondents suggested that implementers must ensure that all information regarding the program is finalized before releasing it to the public so confusion about the program details can be prevented.

Program planning and implementation. A more frequent conduct of the activity would help program beneficiaries stay updated and reminded about the program details. Considering this, it was suggested that the activity be conducted twice a year before each semester starts. During the activity, respondents noted that it should start on time and finish within the allotted period, affecting everyone's time. As per the respondents, one way of avoiding delays is by ensuring that the program has enough workforce. For onsite activity, respondents share that the venue should be considered for the comfortability of not just the facilitators but also the program beneficiaries. Another alternative would be to conduct the activity in smaller groups per barangay.

Program inclusiveness. Respondents offer an alternative solution to enhance activity inclusiveness by leveraging technology. Specifically, implementers can live stream the activity so program beneficiaries can participate and follow the discussion remotely. The next activity involves the collection of plastics from the program beneficiaries. To streamline the process, the 26 barangays were grouped into four clusters, each assigned one day for the turnover session. During their schedule, beneficiaries must complete three steps: (1) weigh the plastics, (2) record the weight on a stub, and (3) enter the weight into the department's computer database and their booklet. This activity is held at the Liwasang Bayan ng Santa Cruz from 8:00 am to 11:00 am (start time varies from time to time).

High amount of plastic requirement. One of the themes that emerged from the participants' statements concerning their challenges in this activity was the high plastic requirement. They expressed that it was difficult to meet the amount as their households do not generate enough waste. Due to this, other program beneficiaries need to source waste outside their households, such as from their neighbors. At the same time, others also resort to picking up plastic litter around their community. Another reason the respondents encountered difficulty collecting the needed requirements is not having enough space to store the plastics to keep them dry before the turnover date.

Need to rent a vehicle to transport plastic waste. The following theme concerns program beneficiaries needing a vehicle service to haul their collected plastics to the turnover site. One of the reasons for this is that the turnover site is far from their residence and that taking public transportation such as jeepneys is not feasible due to the volume of plastic waste they will be submitting. As a result, beneficiaries face additional burdens as they need to rent tricycles, which costs them additional expenses.

Inconsistent schedule of turnover. The following theme that emerged from the responses is the inconsistent turnover schedule set by the department. Each cluster is assigned one Friday every month, giving beneficiaries a once-a-month chance to turn in their plastic waste. However, one of the problems that they encounter is the frequent cancellation of their turnover schedule, mainly due to bad weather. In addition, the department fails to provide an alternative time to reschedule the postponed activity, resulting in further delays in plastic submission on the beneficiaries' side. As a result, respondents shared that plastic waste piles up in their homes.

Non-inclusiveness of the program. As discussed earlier, the turnover of plastic sessions lasts approximately three to four hours and is held every Friday morning. Respondents noted that complying with the schedule is challenging because it coincides with their classes. Some beneficiaries tried to submit after their classes but unfortunately could not due to the time limit.

The following discussion presents respondents' suggestions for implementers on how to prevent the challenges identified in this activity.

Plastic requirement. Respondents suggest that the implementers consider lowering the plastic

collection requirement, as many struggle to meet the quota. Instead of 20 kilos per semester, one of the respondents shared that it could be lowered to 10 kilos per semester to match the capability of students and their households to comply. Moreover, another mentioned that collecting the required amount of plastics can be easier if the department allows more plastics to be submitted, such as plastic bottles.

Transporting the gathered plastics. To ease the burden of students in transporting their bulky plastic wastes, study participants suggest that implementers assign various drop-off points near their residences. Specifically, respondents share that implementers should consider coordinating with each barangay to create or assign drop-off points within their area. Not only will this alternative ease the burden of students in paying for transportation, but it will also shorten the lines during turnover as the activity will simultaneously happen in each barangay.

Inclusiveness of the program. Regarding the activity schedule, respondents request that implementers consider extending the hours of collection so that students who have classes in the morning can still participate in the activity after class hours.

Schedule of turnover sessions. Respondents suggest that implementers conduct the turnover activity more frequently to avoid plastic stuck in their homes. Moreover, having a more frequent schedule per barangay reduces activity delays if one schedule is canceled due to bad weather. Another option respondents mentioned is adding turnover schedules on weekends. Regarding disseminating information, respondents wish that implementers would provide timely announcements on the schedule to keep the beneficiaries updated if prior scheduled activities push through.

The final activity is the grant distribution. At the end of the school year, the implementing office releases a list of qualified scholars – those who met the 40-kilo plastic requirement – along with the details of the cash grant distribution. During the distribution day, beneficiaries must register, undergo orientation, and sign a payout sheet to receive cash assistance.

Poor planning and implementation of the activity. Among others, the delayed distribution of cash assistance is one of the significant problems respondents have encountered. It was considered a challenge as students intend to use this assistance to cover some of their educational expenses. On the other hand, participants also faced difficulties during the activity due to disorganization and the high volume of students scheduled to claim their grants. Program beneficiaries also experienced inconsistencies in grant distribution, as there were times when the department did not release any grants. Some respondents also claimed that they were set to receive cash grants every semester yet were not fulfilled by the department.

Inadequate program information dissemination. According to the respondents, obtaining information about the cash distribution schedule is challenging because the implementing department does not provide announcements and updates.

Absence of accurate beneficiary database. As observed, an accurate beneficiary database for the cash grant distribution was absent. Many respondents pointed out their names were excluded from the list despite completing the plastic requirements within the collection time. As an outcome, student beneficiaries use the department's Facebook page to inform them about their struggles.

The grant amount is not enough. With the rising prices of commodities, one of the respondents pointed out that the current amount of assistance is not enough to help them throughout the academic year. They also believe that students who are dependent solely on the program to ease their educational and financial burden are more likely to encounter this struggle.

Non-inclusiveness of the program. Like other activities under the program, the distribution schedule also falls on weekdays when many of the program beneficiaries have classes. Those who do not have available representatives must wait for another schedule set by the department so they can claim their assistance. As a result, some program beneficiaries must wait longer before they can claim assistance.

Below is the discussion of the respondents' suggestions on how the implementers can improve the conduct of the activity.

Planning and implementation of the activity. Per the respondents, conducting the activity per barangay could help reduce delays and long lines, as it would cater to fewer students and allow a shorter implementation time. Another alternative would be to choose a larger venue to accommodate all participants comfortably while waiting for their turns. Respondents also suggest distributing the grant before the semester starts. In terms of program consistency, implementers must stick to the released program information and strictly follow what they say.

Information dissemination. Like the previous suggestions under the same theme, respondents still suggest that the implementers maximize the use of their social media accounts to provide clear and detailed program updates to their beneficiaries. Respondents suggest including the target distribution date in their announcements for this activity. Moreover, respondents urge implementers to utilize their platform to effectively communicate with beneficiaries about any issues, such as delays in distribution.

Beneficiary database. According to the respondents, the implementers should invest in improving the program's database to avoid releasing an incomplete list of qualified beneficiaries for grant distribution. In relation to this, respondents mentioned that the implementers should also be careful during the validation and verification process (tallying of plastic kilos and creating the master list for the grant distribution) to ensure that all program beneficiaries who completed their requirements will be able to claim their grants.

Amount of grant. Respondents suggest that implementers consider increasing the grant amount and distributing it per semester to better aid the beneficiaries financially. Inclusiveness of the program. According to the respondents, implementers can consider conducting the activity during weekends to allow students to participate in the activity without compromising their class attendance.

The discussion above sheds light on what areas the program needs to improve and how these could be solved. These insights of the respondents are essential for the implementers to consider, given the participants' firsthand experience. In line with Español et al.'s [24] study on public participation in project planning and implementation in the Municipality of South Upi, Maguindanao, Philippines, incorporating beneficiaries' input in planning and implementation positively affects the success and sustainability of a program.

3.3 Social Impacts of the Program

Intended impacts of the program

The discussion below will cover the program's past and present intended impacts from when MENRO handled it to its current handler, LYDO.

Under MENRO, the program's intended impacts concentrate on long-term social, environmental, and political changes. The intended social implications of the program ought to improve Santa Cruz residents' access to quality education and promote consumer responsibility. It also aims to increase awareness of the Ecological Solid Waste Management Act of 2000 (RA 9003) and its municipal ordinances among youth. It is hoped that program beneficiaries will develop the habit of properly managing their solid waste through this. Lastly, the program's intended political impact is the increased participation of the beneficiaries in the programs implemented by the municipality.

Under the implementation of the LYDO, the program's intended impacts focused on social, environmental, and political long-term changes. For the social aspect, the program plans to improve Santa Cruz residents' access to quality education and eliminate discrimination in scholarships and training for both male and female students. The program aims to engage the community in the municipality's environmental conservation efforts for environmental intended impacts.

Furthermore, the program’s impact on the political aspect seeks to instill in its program beneficiaries’ abilities to appreciate political processes.

Perceived impacts of the program

Below is the discussion of the program beneficiaries’ perceptions of the produced social impacts of the *Basura Mo, Edukasyon Ko* Program. For this study, social impacts refer to the effects on the individual, family, community, environment, political systems, and economy that affected the program beneficiaries’ lives.

Impacts on the Individual, Family, and Community

Under this aspect, the analysis of the program’s perceived impact aimed to understand the changes that occurred to the program beneficiaries, their families, and their community in terms of their behavior, social ties, and quality of life (see Table 3). Below are the five themes identified:

Table 3. Themes for the perceived impact of the program on the Individual, Family, and Community

| THEMES | CATEGORIES | FREQUENCY COUNT* | | |
|---------------------------------------|--|------------------|----|----|
| | | I | F | C |
| Development of social responsibility | Practice of proper waste management | 57 | 45 | 31 |
| | Responsible consumer | 12 | 6 | - |
| Increased environmental awareness | Plastic pollution | 6 | 1 | 6 |
| | Increased participation in the municipality’s environmental conservation efforts | 2 | 1 | 1 |
| Improved access to education | Ease financial burden of education | 12 | 17 | 3 |
| Improved quality of life | Health | 1 | 4 | 4 |
| | Cleaner surroundings | 13 | 11 | 64 |
| | Reduced risk of flooding | - | - | 3 |
| Improved relationship and social ties | Improvement of social skills and community ties | 2 | 14 | 15 |

*multiple answers

Development of social responsibility. The first theme refers to respondents becoming more law-abiding citizens in compliance with RA 9003 and becoming responsible consumers. Specifically, the respondents have developed a sense of responsibility by properly disposing of their waste. As program beneficiaries, they learned to start segregating their household waste, which became a habit that continued even after graduating. Moreover, respondents shared that this impact also extended to their families and the community as collecting and segregating their plastic waste became a collective activity. Apart from waste disposal, graduate respondents also became conscious of their purchasing habits, sharing that they now put effort into reducing the generation of their plastic waste.

Increased environmental awareness. The second theme refers to the increased awareness of the program beneficiaries, their family, and the community regarding our society’s current environmental challenges, especially plastic pollution. Participants realized their past unsustainable waste practices contributed to the worsening environmental state. With their raised awareness, participants now act towards environmental protection and conservation.

Improved access to education. The third theme refers to the opportunity provided by the program

to its beneficiaries to continue their education. Specifically, respondents shared that they are using the cash grant to pay for their projects and other school-related expenses supporting their academic journey. Study participants believe that by not asking for additional school allowances, they help to ease their parents' financial burden when sending their children to school. As a result, the money that would have been spent on education was reallocated to cater to other household needs.

Improved quality of life. The fourth theme refers to the improved quality of life of the study participants. As mentioned earlier in the previous theme, participants, their families, and community members developed the habit of picking and segregating their plastic waste. As a result, they now enjoy cleaner surroundings, which benefit one's overall well-being. Since plastics are continuously stored and collected, the risk of flooding during mild to heavy rains due to waste-clogged drains and canals has also been reduced. This lowers the possibility of the community members catching water-borne and vector-borne diseases. In addition, burning their waste is eliminated as they save it to complete the scholar's plastic requirement, thus avoiding inhaling toxic fumes.

Improved relationship and social ties. The last theme focuses on the perceived impact of the program on the relationship of program beneficiaries with their family and community. As per the respondents, being part of the program united them more as a family, working together to reach the target requirement. Also, the impact of improved relationships extended to the community, resulting in a broader social network. For further context, participants mentioned that they needed to source out plastic waste due to the high plastic requirement of the program. Having said this, they tapped their neighbors, who willingly provided their assistance, developing the sense of "Bayanihan." The desire of the community members to help, as mentioned, is not only to reduce their household waste but also to help the scholars continue their education.

These findings validated the study conducted by Edullantes et al. [25] in Barangay 22, Cagayan De Oro City, revealing positive changes in community residents' knowledge, attitudes, and practices after implementing community-based environmental initiatives. Both studies observed increased awareness regarding solid waste as a pollutant and notable changes in practices related to proper waste management. Given these positive results, it is essential to sustain such initiatives to help ensure that the program's objectives will be sustained.

Impacts on the Environment

Under this aspect is the discussion of the respondent's perceptions of the program's impacts on the natural and man-made environment (see Table 4). The three identified themes are as follows:

Table 4. Themes for the perceived impact of the program on the Environment

| THEMES | CATEGORIES | FREQUENCY COUNT* |
|------------------------|--|------------------|
| Environment protection | Preventing pollution on land, water, and air | 65 |
| Resource conservation | Waste as input for co processing | 2 |
| | Recycling | 29 |
| Cleaner environment | Cleaner surroundings | 58 |
| | Lower risk of flooding | 16 |

*multiple answers

Environmental protection. The first theme highlights the perceived environmental impact of the program. Per the respondents, their practice of segregation and collection of improperly disposed wastes on the streets helped prevent pollution in land, water, and air. For instance, the program reduces land pollution by diverting waste from landfills to its partners, decreasing the amount of

municipal waste dumped in sanitary landfills. Also, they noted a reduction in the waste disposed of in the Santa Cruz River, mitigating water pollution. Furthermore, the elimination of the practice of burning waste contributes to the reduction of greenhouse gas emissions. As a result, respondents believe that the environment is now safer for organisms.

Resource conservation. The second theme refers to the perceived impacts of the program on resource management, specifically in its preservation. According to the respondents, the program encouraged more beneficiaries to participate in recycling. Specifically, the respondents cited that the waste they collected is being used to create new products such as monobloc chairs. They also shared that the plastic wastes they collected are used as raw input in the production process conducted by partner companies. Having said this, participants perceived that the program has contributed to resource conservation through recycling as it lessened the need to use new raw materials to produce the said products.

Cleaner built environment. According to the participants, the program has improved the cleanliness of their surroundings, making it more pleasing to the eye. Moreover, considering the practice of scholars of picking up waste, the risk of flooding in the municipality has been lessened as the amount of waste that could clog drains and canals has been drastically reduced.

The findings indicate that the waste diversion program positively impacts the environment. This aligns with Sapuay's [26] review of waste management practices in Quezon and Pasig City, as well as Shumal et al.'s [27] study in Isfahan, Iran, particularly in terms of resource recovery through refuse-derived fuel (RDF). The respondents' perceptions of pollution prevention and resource conservation were similarly reflected in the benefits of diverting waste to RDF facilities in both cities. These benefits included reduced dependence on fossil fuels in cement production, adherence to the 3Rs of waste management (Reduce, Reuse, Recycle), and eliminating secondary pollution from waste emissions. With this, program implementers should ensure the continued achievement of its objectives and explore opportunities to scale the program to further contribute to sustainable development.

Impacts on the Political System

Below is the discussion of the data gathered about the program's current monitoring and evaluation system that implementers have in place. The discussion below also includes the respondents' perceived changes in their overall level of participation as members of the municipality.

One of the most critical phases in the program cycle is the monitoring and evaluation phase [28]. During this stage, data regarding the program's implementation is collected and analyzed to be used as a guide to create an informed decision regarding a program's ways forward [29]. In relation to this, one of the ways to collect data is by directly consulting the beneficiaries through a feedback activity [30].

In the context of this study, data shows that only 27% of the participants have experienced being consulted about the program. In comparison, the majority (or 73%) of participants did not experience being consulted during the program's implementation.

In terms of the availability of channels provided by the program implementers for communication and feedback, more than half (61%) of the respondents said that there are available channels that they can use to share challenges and recommendations about the program. Per the respondents, the primary way to communicate and provide feedback about the program to the program implementers is through their social media accounts, such as their Facebook page and Messenger. However, respondents share that although online communication channels exist, implementers tend to be unresponsive to their messages. In addition to these channels, others use different means to communicate. Some contact the office through its phone number, visit the physical office or speak with barangay officials. The barangay officials then relay their concerns to the implementers.

In continuation, 39% of participants said there was no available channel for feedback. When asked how they communicate their feedback, participants mentioned sharing their insights with the implementers during the plastic turnover sessions, visiting the physical office, or reaching out to barangay officials and letting them communicate with the municipality. However, other respondents mentioned that they do not communicate their concerns to anyone; few choose to vent their concerns with their friends who are also part of the program, while some wait for further updates from the implementers.

Study participants were also asked about their views on the contribution of consulting program beneficiaries to improving the *BasuEskolar* Program. The majority (98%) of the respondents agreed that beneficiary consultation is beneficial to the improvement of the program, while only 2% do not, stating that they do not think that the implementers take their insights into account when making decisions on the program’s ways forward.

Below is the discussion of the themes of the perception of 98% of the respondents on why consulting program beneficiaries contribute positively to the improvement of the program. Table 5 presents the summary of the themes discussed.

Table 5. Themes on why consulting program beneficiaries contribute positively to the improvement of the program

| THEMES | CATEGORIES | FREQUENCY COUNT* |
|---|---|------------------|
| Source of valuable inputs | First-hand experience | 34 |
| | Recommendations | 49 |
| | Raise concerns and challenges | 25 |
| Better communication of program information | Reminders about dos and don'ts on the program | 2 |
| | Venue for updating ng beneficiaries | 1 |

*multiple answers

Beneficiaries have firsthand experience. According to the respondents, consulting the beneficiaries benefits the program’s improvement because they are valuable input sources as they have firsthand experience with the program implementation. From the participants’ perspectives, consultation is a venue to evaluate the program and provide feedback on its implementation. Moreover, respondents share that participating in such activities will enable them to voice their concerns. This, in turn, could assist the implementers in designing solutions that will cater directly to their problems, improving the program’s inclusiveness and effectiveness. Overall, they consider the activity not only an opportunity to improve the program but also an opportunity to enhance the benefits they will receive as program beneficiaries.

Better communication between implementers and program beneficiaries. Consultation activities for the respondents can also be a venue for implementers to provide updates and reminders about the program. As some respondents noted, implementers can utilize consultation activities to explain the program further or to remind participants how the program operates. This may help participants develop a better appreciation and understanding of the program.

Considering the discussion above, the outlook of the program beneficiaries towards consultation in terms of monitoring and evaluation of the program can be regarded as positive. It may result in a high level of participation. Therefore, program implementers should improve their communication methods with the beneficiaries to ensure that feedback can be effectively provided to the program. Also, program implementers should consider developing and implementing a

more robust monitoring and evaluation system for the *BasuEskolar* Program to generate data that they can use to decide on the program’s future.

The discussion below presents the perception of beneficiaries on the impact of the program on their level of participation as members of the municipality.

Increased community engagement. Respondents believe that being part of the program has increased their engagement and involvement in their community. Like the prior discussion (under the impacts on individual, family, and community), study participants shared that they feel engaged in the community while performing their duties as program beneficiaries in terms of collecting waste, resulting in the maintenance of the cleanliness of their community. One participant cited that they feel a sense of belongingness as they work towards improving their community. Also, respondents desired to participate in other activities implemented by the municipality. Another noted that they become more involved in resolving issues they see in the municipality. Such changes, as viewed by one of the respondents, can be attributed to the desire of the participants to give back to the municipality for the assistance they have received.

The results above indicate that local community development initiatives positively impact people’s participation. The study of Wiset et al. [31] in the restoration of degraded forest landscapes in Leyte and Biliran provinces emphasized that high community engagement is essential for ensuring a program’s sustainability and success, especially at the local level.

Furthermore, the study underlines that involving the community in decision-making is critical for long-term sustainability and success. With this, the program implementers should expand the opportunities for community involvement in different program phases, leveraging these opportunities to further the social impacts of development initiatives.

Economic Impacts

The discussion below is about the respondents’ views on the impact of the program on their finances (see Table 6). The following are the two themes identified:

Table 6. Themes for the perceived impact of the program on the Economic aspect of the respondents’ lives

| THEMES | CATEGORIES | FREQUENCY COUNT |
|---|-----------------------|-----------------|
| Reduced household expenses on education | Financial support | 91 |
| Increased financial literacy | Budgeting of expenses | 2 |
| | Savings | 4 |
| | Business capital | 1 |

Reduced household expenses on education. One of the most evident themes that emerged was the program’s impact on the costs of the program beneficiaries. Respondents shared that the cash grant provided by the program has helped them reduce their expenditures for their educational needs. Participants shared that they could pay for different school-related fees using cash assistance, which eased the financial burden of their families on education. Apart from this, some respondents could also help their parents by contributing to their household expenses by giving some, if not all, of the grant to their parents.

Increased financial literacy. The second theme was the program’s impact on the beneficiaries’ financial literacy. According to the respondents, the cash assistance helped them learn how to manage their finances through budgeting, saving, and investing. One of the respondents shared

that having an extra source of income allowed them to practice budgeting, and as a result, they could finance their education by not needing to work for extra money or ask for it from their parents. Another respondent noted that they used the cash grant as capital for a small business, generating additional income that helped cover their educational expenses.

Although the discussion above indicates that the cash grant from the waste-to-cash program contributed to their educational needs, they also mentioned that the amount they receive is insufficient to cover all their needs. It was observed that 35% of the respondents used up the grant in two to three weeks, while 30% spent less than a week. Although there are others (21%) that used the grant for a month, and few (14%) were able to use it for more than a month, still, for the majority (65%) of the respondents, the financial assistance only covers a portion of their expenses amounting to less than a month of expenses.

In addition, Figure 2 shows where the participants spend their cash assistance. Almost half (49.8%) of the respondents spend their grants on their school allowance; some (20.7%) allocate portions of it for their household needs, e.g., grocery items shared within the family, transportation budget (19.9%), utilities, i.e., electricity, water, and internet plan (5%). This shows that apart from their student expenses, they also have other financial responsibilities inside their households. Some of them revealed that they are self-supporting students. Thus, the implementers need to revisit the amount of the grant to ensure that the program produces its intended impact on the lives of its beneficiaries.

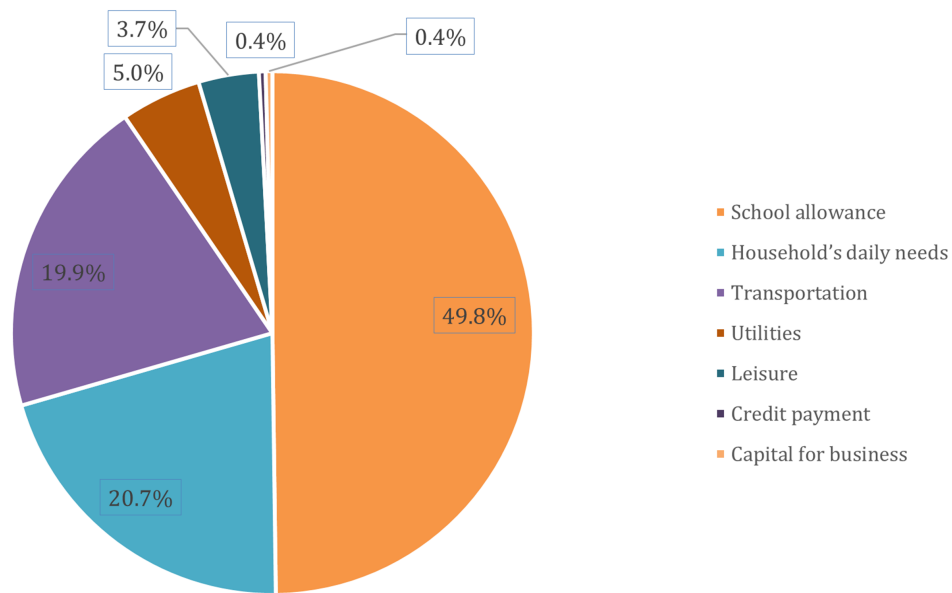


Figure 2.
Percent distribution of participants by where they spend their cash assistance

In summary, the program has impacted the beneficiaries' social, environmental, economic, and political lives. Specifically, respondents, their families, and communities reported changes in knowledge, attitudes, and practices regarding proper waste management. Regarding environmental impact, the respondents believe the program has positively contributed to preventing land, water, and air pollution and keeping their community clean. Regarding economic impact, respondents indicated that the program has helped reduce education-related expenses but expressed that the grant was insufficient to cover their educational needs fully. Moreover, the study found that respondents had positive views on being consulted, although the implementing agency does not yet have a formal monitoring and evaluation system. For the political aspect, the program has provided respondents with an opportunity to increase their engagement within their community.

The findings support Premakumara et al. [32] on the local implementation of the national policy RA 9003 in Cebu City and Fuentes [33] in Barangay Potrero, Malabon City. Both studies observed positive impacts on waste management practices, environmental conditions, public participation, and income from implementing municipal solid waste management strategies. They highlight the importance of strong political commitment, governance, and local adoption of national policies like RA 9003 to maximize the impacts of development policies at the municipal level.

4 Conclusion

One of the programs of the Municipality of Santa Cruz, Laguna, to help address the municipality's waste problem is the implementation of the *Basura Mo, Edukasyon Ko* Program. The program has not yet undergone review and evaluation, having been implemented for a few years. Results showed that the program produced impacts that positively changed the lives of the respondents, their families, the community, and the environment. Moreover, it has also influenced the political systems and the economic aspect of the beneficiaries' lives. However, although findings revealed that the program produced positive impacts, data also shows some aspects of its implementation that need improvement to further its effectiveness. Specifically, the program needs to improve its planning and implementation of activities, consult with the beneficiaries, distribute the grant, and communicate the program requirements. As evidenced in this study, interventions, when implemented properly, produce intended results and may resolve specific problems. However, it is also important to note that apart from proper implementation, an intense monitoring and evaluation system ensures that the program is effective and will obtain its intended results. Having said this, SIA as a tool has proven helpful in both collecting data for program evaluation and assisting program implementers in making a data-driven decision for the program's future.

5 Recommendations

Based on the findings of this study, the following are the recommendations for the program implementers, program beneficiaries, and future researchers:

For the program implementers

The social impacts of the program can be improved by increasing the municipality's efforts to promote responsible consumption through information, education, and communication (IEC) campaigns to ensure that values about SD will be instilled in the program beneficiaries. Moreover, recycling and composting should be promoted as additional waste management practices at the source level to increase the number of program beneficiaries participating in the activity. These activities can help the municipality achieve sustainable development goals by 2030. Conducting additional activities, like seminars and workshops focused on environmental protection and conservation, can enhance the program's environmental impacts. These activities should raise students' awareness of current ecological issues and emphasize the importance of their participation in achieving SD. Also, opportunities should be available for program participants to get involved in community-wide or municipal-wide activities for environmental conservation and preservation.

Regarding economic impacts, implementers should consider revisiting the current grant amount in response to the rising prices of necessities. Apart from this, the planning and implementation of cash distribution activity should be reviewed to ensure that beneficiaries can utilize the grant in time for their semestral needs and that the distribution activity is managed well logistically.

Consistent schedules of consultations with beneficiaries, designing a tool for program evaluation, and conducting evaluations throughout the program's implementation could improve the program's political impacts as it ensures that beneficiaries contribute to the improvement of the program's effectiveness through feedback.

For the program beneficiaries

It is recommended that they remain involved and participative throughout the program activities to guarantee that the program can achieve its objectives and that the beneficiaries reap the program benefits.

For future researchers

For future researchers, the study recommends FGD as an additional methodology for a more open and free-flowing discussion that allows follow-up questions to supplement the data gathered using surveys. Future researchers may also collect data from non-program participants who benefit from the program (e.g., community members) for a broader perspective on its impacts. In addition, understanding the satisfaction level of program participants on the program's implementation along with the SIA can help produce a more in-depth report, which will be vital in the decision-making process of the implementers concerning the program's ways forward.

Statements and Declarations

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Conflict of Interest

The authors declare no conflict of interest.

Ethical Considerations

Although undergraduate research is not required to undergo review by the Research Ethics Board, the researchers ensured that the study adhered to ethical standards for research involving human participants. Before being conducted, the co-authors, with research ethics certification, reviewed the research methodology, ensuring compliance with the ethical standards. Informed consent was obtained from the participants, including clauses about voluntary participation and confidentiality of provided information in compliance with the Data Privacy Act of 2012.

Author Contributions

K.F.D.V., E.S.V., D.B.G.: conceptualization, coordination, formal analysis, investigation, writing—original draft preparation, visualization.

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