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Innovation in Waste Bank Management Through Business Model Canvas and Social Entrepreneurship Approach

Maria Sri Wulandari*, Cicilia Nurasti, Florensia Eka Gopito, Kristina Siti, & Antonius Sumarwan SJ

Master of Management, Sanata Dharma University, Yogyakarta, Indonesia

Abstract

This study aims to develop an innovative school waste bank model based on social entrepreneurship using the Business Model Canvas (BMC) framework to increase student and community participation in sustainable waste management. A descriptive qualitative approach with a case study strategy was conducted at SMK Strada II, West Jakarta. Data were collected through in-depth interviews, observation, document analysis, and focus group discussions. The results show that integrating BMC elements such as key partners, value propositions, and revenue streams strengthens the program's structure and sustainability. Active involvement of students and the surrounding community enhances its educational, social, and economic functions. Simple incentives and collaborative approaches effectively raise environmental awareness. This study is limited to one school and has not measured long-term impacts. The findings offer opportunities to replicate the model in other schools and encourage educational policies based on social entrepreneurship and environmental education.

Keywords: School waste bank; BMC; social entrepreneurship; Student participation

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1. Introduction

The problem of waste in urban areas, especially in Jakarta, has reached an alarming point. According to data from the official portal of the Jakarta Environmental Agency's Integrated Waste Management Unit, starting in 2019, and the Head of the Jakarta Environmental Agency (DLH) Asep Kuswanto in his statement in 2024, the Bantargebang Final Disposal Site (TPA) receives more than 7,800 tons of waste every day. This figure not only illustrates the high consumption pattern of the community, but also shows the low awareness in sorting waste and the lack of collective participation in sustainable waste management.

In this context, schools, especially at the secondary level, have a strategic role in shaping environmental awareness and habits among the younger generation. One approach that is now starting to develop is through the school waste bank program, where students are directly involved in the activities of sorting, collecting, and managing inorganic waste that has economic value. However, in reality, many waste bank programs in schools are still running conventionally, have not been integrated with the learning process, and do not have a neat and sustainable operational model.

One of the schools that has started the waste bank program is SMK Strada II in West Jakarta. Although the program has had an initial positive impact on changing student behavior, a number of challenges still have to be faced. Among them are the lack of innovation in program implementation, the lack of a solid management structure, and low involvement of the surrounding community. Seeing these conditions, it is necessary to develop a new model that not only strengthens the educational and ecological aspects of the waste bank, but also adopts a social entrepreneurship approach. By utilizing the Business Model Canvas (BMC) framework, school waste bank programs can be designed in a more structured, sustainable, and attractive way for the various parties involved.

* Corresponding author.
E-mail address: mariasriwulandari@gmail.com

This waste bank program is also integrated into the learning curriculum with the hope of making environmental issues that occur part of an active, contextual, and applicative educational process. At SMK Strada II, this program can be integrated into entrepreneurship subjects where students can learn to make products from waste (recycling) and learn to find marketing strategies from the environmentally friendly products produced.

Through this approach, it is hoped that the school waste bank program can be transformed into something more than just a routine activity. It is a means of empowerment, meaningful learning, and a bridge of active involvement between schools and the community. If successful, this model has the potential to be replicated in other schools that face similar challenges. In particular, this article aims to answer the question of how innovative waste bank practices integrated into the curriculum can improve the sustainability and participation of SMK Strada II students and expand their reach.

The waste bank was born from the Jakarta Green and Clean program, which is one of the ways of managing household waste, which focuses on empowering the community in managing household waste. A waste bank is a place to store waste that has been selected according to the type of waste, waste stored in a waste bank is waste that has economic value (Personal, B., Siregar, A., & Mulyadi, 2021). The way waste banks work in general is almost the same as other banks: there are customers, bookkeeping and management management. In banks that we usually know, what customers deposit is money, while in waste banks, what is deposited is waste that has economic value. Furthermore, waste bank managers must be creative and innovative people and have an entrepreneurial spirit in order to increase people's income (Personal, B., Siregar, A., & Mulyadi, 2021).

Juridically, waste bank management activities in Indonesia have been regulated in Law of the Republic of Indonesia Number 18 of 2008 concerning Waste Management; Government Regulation of the Republic of Indonesia Number 81 of 2012 concerning the Management of Household Waste and Similar Waste of Household Waste; then Regulation of the Minister of Environment of the Republic of Indonesia Number 13 of 2012 concerning guidelines for the implementation of reduce, reuse, and recycle through waste banks. The Jakarta Regional Government also issued Regional Regulation No. 03 of 2013 concerning Waste Management and Regional Regulation No. 4 of 2019 concerning Amendments to Regional Regulation No. 03 of 2019 concerning Waste Management.

Waste banks have a good impact on the community and avoid the community from exposure to bacteria and diseases caused by piles of waste that cannot be managed properly and correctly. The existence of waste banks can slowly change the stigma of the community to interpret waste as something that has value that can be used as a valuable product while reducing the amount of national waste. The importance of the role of the waste bank program, so that in its management it requires attention and contributions from all parties to remain able to maintain environmental sustainability (Hasbiah, S., Yustiani, Y., & Permatasari, 2021; Muhtadi, 2017).

In addition to the regulatory aspect, the literature also highlights the important role of environmental education in supporting the sustainability of waste banks in educational institutions. According to Revelation (2020), the integration of waste bank activities with the curriculum and students' habituation in sorting waste can foster the character of caring for the environment from an early age. Contextual learning theory *(Contextual Teaching and Learning/CTL*) emphasizes the relationship between teaching materials and real-life contexts. According to Johnson, D. W., & Johnson (1999)., this approach increases knowledge retention by up to 70% compared to the passive method. Waste bank programs that are integrated into entrepreneurial subjects, such as the creation of recycled products and marketing strategies, are a direct implementation of this theory. Students not only understand the concept of the circular economy theoretically but also apply it through real projects, thereby strengthening entrepreneurial competence and environmental literacy.

On the other hand, a collaborative approach between schools, families, and communities strengthens the ecosystem that supports the program's success. Community Participation Theory (Arnstein, 1969)classify the level of citizen involvement in eight levels, ranging from manipulation to citizen power. In the context of the school waste bank, the participation of students and residents is at the level of *Partnership* (partnership) and *delegated power* (delegation of authority), where they are not only involved in waste sorting but also in program decision-making. This is in line with research findings that collaboration between students, teachers, and external partners (such as DLH and MSMEs) increases a sense of ownership of the program. The active participation of all stakeholders, not just symbolic presence, is key to the sustainability of environmental programs in schools. In this context, the whole-school approach and the eco-school model are relevant to be applied as a strategic framework for the development of education-based waste banks (Handayani, D., & Susilo, 2022).

Furthermore, successful waste bank management generally applies the principles of sustainable development, especially in the environmental, economic, and social pillars. Economic impact can be seen from increasing the additional income of residents or students, while social impacts include increasing citizen participation, strengthening community

networks, and developing the character of responsibility and mutual cooperation. Thus, waste banks are not only part of waste management solutions, but can also function as a vehicle for learning social entrepreneurship, community empowerment, and ecological character development in the educational environment and the wider community.

The Business Model Canvas (BMC) can be applied as a guide for the innovation of the school waste bank program to increase its operational effectiveness, optimize the good impact of the bank, and ensure its sustainability. Created by Osterwalder, A., & Pigneur (2010).The Business Model Canvas (BMC) consists of 9 core elements that enable thorough business model planning by visualizing, analyzing, and developing existing business models. The implementation of BMC in the school waste bank program allows these activities to transform from just social activities to programs that are planned, measurable, and have a long-term impact.

The implementation of BMC in school waste banks includes 9 elements, namely customer segments (school community and surrounding residents), value propositions (environmental education and circular economy), channels (socialization, school digital platforms), customer relationships (loyalty programs and routine activities), revenue streams (waste sales and recycled products), key resources (managers, students and facilities), key activities (education, sorting, training, key partnerships (Environment Agency (DLH), collectors, business partners), and cost structure (operational, education, development).

Deep Dees (2001) and Chahine (2016) Social entrepreneurship is an effort to create solutions to social problems with an innovative and sustainable approach. One form of social entrepreneurship is the school waste bank because it can create social and economic value and with the existence of a school waste bank can overcome the content of the social environment. According to Hungerford & Volk (1990), effective environmental education instills value through real action. This waste bank program is a means of active student participation, learning with a model *Project-based learning* and also cross-stakeholder collaboration.

In the context of SMK Strada II's innovative waste bank program, the active involvement of students and local residents is a key element in the success of the program. Student participation is not only important as part of contextual learning, but also as a strategy for building character, social responsibility, and environmental leadership from an early age. When students are directly involved in the process of sorting, collecting, and managing waste, they not only understand the theory of the environment, but also experience firsthand the dynamics of teamwork, decision-making, and social entrepreneurial values such as innovation, empathy, and sustainability. These activities provide a space for students to become real agents of change in their school community.

On the other hand, the involvement of local residents, including parents, community leaders, and external partners, expands the reach and impact of the program. This collaboration creates a social ecosystem that supports environmental education more broadly, as well as changing people's perception of waste from something useless to a resource that has economic and social value. The presence of residents as part of the waste bank's chain of activities also increases the sense of ownership and collective responsibility in maintaining cleanliness and environmental sustainability.

The combination of active involvement between students and residents strengthens the educational and social dimensions of the school waste bank. This makes the program not only belong to the school, but also part of a community-based joint environmental movement. With this approach, the sustainability of the program is more assured because it is supported by a participatory spirit and a sense of responsibility across generations.

Furthermore, integrating social entrepreneurship approaches is an added value in the development of the school waste bank program. Social entrepreneurship emphasizes the creation of social value through innovation and sustainability, not just the pursuit of financial gain (Dees, 2001). In the context of schools, social entrepreneurship values can shape the character of students who not only care about the environment, but are also able to think creatively and solutively in answering the social challenges that exist around them. Thus, the BMC-based waste bank program and oriented towards social entrepreneurship provides a great opportunity to foster student social leadership while expanding the impact of the program to the surrounding community.

Through the integration of BMC and social entrepreneurship, the waste bank program no longer stands as a separate initiative, but rather becomes part of the character education strategy and the development of environment-based social entrepreneurship competencies in schools. This is in line with 21st century education efforts that encourage contextual, collaborative, and direct impact on real-life learning.

The main section of an article should start with an introductory section which provides more details about the paper's purposes, motivation, research methods, and findings. The introduction should be relatively nontechnical, yet clear enough for an informed reader to understand the manuscript's contribution.

2. Literature Review

2.1. Waste Bank

The waste bank was born from the Jakarta program *Green and Clean*, which is one of the ways of managing household waste, which emphasizes community empowerment in managing household waste. A waste bank is a place to store waste that has been selected according to the type of waste, waste stored in a waste bank is waste that has economic value (Personal, B., Siregar, A., & Mulyadi, 2021). The way waste banks work in general is almost the same as other banks: there are customers, bookkeeping and management management. In banks that we usually know, what customers deposit is money, while in waste banks, what is deposited is waste that has economic value. Furthermore, waste bank managers must be creative and innovative people and have an entrepreneurial spirit in order to increase people's income (Siregar, 2021).

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2.3. Application of BMC in Waste Bank Management

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3. Methods

This study uses a qualitative approach that is exploratory (Creswell, 2014) with a case study strategy (Yin, 2018). The case study was chosen because it allows the researcher to understand in depth the practice of waste bank management at SMK Strada II as a contextual phenomenon in a real environment. This approach was chosen because it was able to capture the complexity of social dynamics, organizational culture, and interaction between actors in the implementation of environmental programs and waste bank management at SMK Strada II. Qualitative research does not aim to produce generalizations, but rather to examine in depth specific phenomena in one particular context. The case study provides flexibility to explore the decision-making process, program implementation strategy, stakeholder engagement, challenges faced, and the impact of the program on the school's internal and external environment, such as the community and cooperation partners. The main emphasis is placed on understanding the subjective meanings of the participants and the social context in which the interaction takes place, making this approach relevant and appropriate to the focus of the study.

The school's official documents, including the Decree on the Establishment of the Adiwiyata School Work Team No. 226/SMK Strada II/VIII/2022, the Decree on the Management Composition of the Waste Bank of SMK Strada II West Jakarta Number: 229/SMK II/SK/II/2025, SOPs on the processing of school waste banks, work plans, reports on Strada Waste Bank activities, and records of cooperation (MoU) with partners, were analyzed as a complement and a means of validation of primary data.

In the implementation of research, researchers play the role of the main instrument that is actively involved in the process of data collection, interpretation, and analysis. This engagement is not only technical, but also includes building meaningful relationships with participants to understand their experiences and perspectives more deeply. Sensitivity to the local context and socio-cultural background of the participants is essential to keep the interpretation results authentic and unbiased. The research was conducted at SMK Strada II as a single study location, with the implementation in February-June 2025, coinciding with the school environment program. This allows researchers to make direct observations of relevant activities.

Data collection was carried out by triangulation techniques, which included in-depth interviews, participatory and non-participatory observations, focus group discussions (FGDs), and documentation studies. Interviews were conducted with 30 students, 11 teachers, 5 school staff, 10 people from the surrounding community, and external partners of DLH Tamansari District, West Jakarta, 2 people and from Tamansari Village amounting to 1 person. The interviews took place in February and June 2025 with a duration of approximately 15-120 minutes each to explore their personal experiences and perceptions regarding the implementation of the program.

Observation is carried out directly both with the active involvement of the researcher in activities (participatory) and as observers without intervention (non-participatory), to capture real practices and social interactions in the field. The FGD is used to gain a collective understanding and dynamics between actors from various perspectives. The research participants were selected purposively, covering various actors relevant to the implementation of environmental programs in schools. They include students as daily implementers of waste bank activities, teachers and staff as program facilitators and policy makers, the surrounding community as impact recipients or participatory partners, and partner institutions such as environmental agencies or social organizations involved in program cooperation. This selection considers the level of involvement and informative capacity of the participants in providing contextual and in-depth data.

The data analysis process is carried out in stages, starting with verbatim transcription of all interview recordings to ensure the accuracy of the information. Next, the researcher conducted a thorough reading to gain an initial understanding of the context of the data. The data is then coded systematically, by identifying important parts that are relevant to the focus of the research. The coding process is geared towards grouping the data according to the nine elements in the Business Model Canvas (BMC) framework, namely value proposition, customer segments, distribution channels, customer relationships, revenue sources, key resources, key activities, key partners, and cost structure. The codes are then consolidated into key themes that reflect the structure and dynamics of the social business model run by the school.

The findings were systematically compiled based on BMC elements, and each section was reinforced with direct citations from participants to improve the validity of the data. In addition to the BMC-based thematic approach, this study also adopts design thinking principles in data interpretation, especially in the stages of empathy for actors, precise problem identification, and formulation of applicable and sustainable solutions. This design approach allows

researchers not only to analyze the ongoing situation, but also to formulate strategies to improve the sustainability of environment-based social entrepreneurship programs in vocational education environments.

This research not only aims to understand the existing phenomenon, but also to design and test concrete solution models for waste management problems in schools. Therefore, the Design Science Research (DSR) approach is used to complement the qualitative approach of the case study which is exploratory in nature (Seckler, C., Mauer, R., & Vom Brocke, 2021). Design Science Research (DSR) is a research approach that focuses on the creation and evaluation of design artifacts or products, whether in the form of systems, models, processes, or instruments intended to solve practical problems and contribute to the development of science (Hevner et al., 2004). This approach is in line with Asteria & Heruman (2016), which shows the waste bank as a community-based solution. Moreover Dewbroto (2013) emphasizing the importance of BMC as a strategic tool for designing and evaluating business models, which reinforces the artifact methodology in this DSR research.

In the context of this study, the artifacts developed are an innovative model of school waste banks based on Business Model Canvas (BMC) and social entrepreneurship, which is designed to increase the participation of students and school residents in waste management, while strengthening the educational, social, and economic dimensions.

4. Result and Discussions

4.1. Waste Bank Management Before Design Design

Before 2023, waste management at SMK Strada II has not been properly organized. Garbage from learning activities, canteens, and school environments accumulates without sorting. Plastic bottle waste, paper, food scraps, and even other waste are simply mixed in a limited landfill. This condition is even worse because garbage collectors rarely come to transport, so that piles of garbage become a source of unpleasant odors and cause discomfort for all school residents.

In 2023, awareness of the importance of protecting the environment has prompted SMK Strada II to start a waste bank program, even without an officially issued decree. As an educational institution, this step is a form of moral responsibility for environmental sustainability and also the education of students' character in terms of social and ecological concerns. But unfortunately, even though this initiative has started, its management is still far from optimal. The waste bank program at this school is still running conventionally, even tending to be halfway through.

Students and teachers are used to throwing garbage into bins that are differentiated by type: organic, inorganic, and B3 (hazardous and toxic materials). In fact, some classes already have special bins for plastic bottles and waste paper. But problems arise after the sorting is complete. There is no clear flow regarding who is in charge of collecting and weighing the waste, where the waste will be taken, how the waste can be handled economically, and what benefits schools get from the results of waste sorting activities. The lack of structure and organization means that no one is specifically responsible for the waste bank. The sorting activity only happened because of the initiative of a few teachers and students who cared. There is no routine collection schedule, no routine recording of the amount or type of waste collected, and no documented reports. As a result, several times it was seen that piles of plastic bottles and cardboard in the corner of the school warehouse were piled up without a clear purpose, even becoming a nest of rats, dust and insects. The potential of waste as a source of education and additional funds is wasted.

The enthusiasm of students and teachers is actually not low. Many already understand the importance of sorting waste and maintaining cleanliness. However, due to the absence of a clear management system, the positive energy does not lead to sustainable action. The spirit is there but not driven by a good system. Waste bank activities are often only carried out when there is a cleanliness competition or certain moments. In fact, if managed seriously, the waste bank can be a source of student cash funds, support student council activities, and become part of the curriculum of the Pancasila student profile strengthening project (P5).

Table 1. Comparison of Waste Bank Management Design Before and After Innovation

Aspects	Before Innovation	After Innovation
Organizational Structure	There is no special structure; Activities are sporadic and uncoordinated	An official Waste Bank management structure was formed through the Principal's Decree; Involving teachers, students, and staff

Aspects	Before Innovation	After Innovation
Logging System	There is no routine record-keeping system; Undocumented data collected	Implemented a waste savings system; recording of the type and weight of waste per class and individual digitally/manually
Types of Waste Managed	Only basic sorting (organic and inorganic); No advanced processing	Sorting in more detail: plastic bottles, paper, cardboard, used cooking and leaves; Processed into fertilizer and soap
Organic Waste Treatment	Unprocessed; just thrown away or piled up in the school environment	Processed into liquid and solid compost using a simple composter method
Utilization of Inorganic Waste	There is no certainty of management; sometimes it accumulates or is just thrown away	Sold to partners (One Heart Waste Bank, Polar Social House); Sales results are utilized and recorded
Educational Activities	Not integrated with the curriculum; incidental nature	Integrated in Entrepreneurship and P5 subjects; There are training and exhibitions of recycled works
Use of Technology	Manual, without digitization	Introduced the "EcoStrada" application for the recording, reporting and monitoring of waste savings
Student Engagement	Only limited to being a sorting implementer without a managerial role	Students are involved as administrators, recorders, marketers of recycled products, and Green Ambassadors (Environmental Ambassadors)
External Collaboration	No formal cooperation with external partners	Partnerships are established with DLH, MSMEs, and the recycling community for product training and distribution
Economic Value	There are no obvious economic benefits; Unstructured sales results	The value of the sale is recorded as savings; used for scholarships, student council activities, and other social activities
Learning Approach	Not contextual, not integrated with the educational process	Using the Contextual Teaching & Learning and Project-Based Learning (PjBL) approach

4.2. New Design of Waste Banks at SMK Strada II and Its Practice

Seeing this condition, some teachers and students began to be stimulated to find a solution. They then initiated the application of the 3R *(Reduce, Reuse, Recycle)* principle, starting from reduce by reducing and sorting waste at the classroom level and school environment. Reuse by reusing items that can still be used without the need for further processing, such as using cloth shopping bags, using paper back and forth. Recycle processes waste into new items, for example, leaves are processed into organic fertilizer, used cooking oil into hand soap. However, this initial step did not go smoothly. After a large amount of plastic bottle and paper waste was collected, a new obstacle arose, namely the difficulty of finding collectors who were willing to come regularly to buy the waste. They have even found a collector, but plastic bottles and milling paper have to be delivered by themselves and the distance is far from the school. Then the results of indirect sales are managed neatly. The money earned has not been systematically recorded, and its use has not been structured. An example of an activity that uses money from the sale of plastic bottles in student council activities, but the recording is still careless. The next step is that the school has also sold plastic bottles at the waste bank in RW 01 Tamansari, but only plastic bottles sell while other waste does not receive them, then it is only recorded and has not received economic benefits. As in the IJSCL journal, the waste bank service process in general still encounters many problems with manual recording in books so that accuracy and accuracy are very unsatisfactory. Based on the rapid development of technology and supported by internet services that are quite good to enter Cintamulya Village, an application system is needed to help the administrative and operational process of the waste bank and make it easier for customers to access transaction data and information from the waste bank in real time. Therefore, digitization is needed using an android-based application that we subsequently develop.

Table 2. Waste Bank Innovation Design of SMK Strada II

No	Design Components	Applied Innovations	Purpose and Benefits
1.	Waste Passbook	Each class and individual student has a waste passbook that records its weight, type of waste, and economic value	Increase transparency, foster a sense of belonging, and motivate students to continue participating
2.	Waste Management Flow	Systematic flow: sorting → weighing → recording → storage → sales/processing → utilization of results	Provide clarity of work processes, build discipline, and operational efficiency
3.	Waste Price Table	The official table of the Waste Bank "EcoStrada" lists the buy/sell prices of waste by type (bottles, cardboard, etc.)	Become a reference for economic value and transparency for students and managers; Educating Financial Literacy
4.	Digitization (EcoStrada App)	Internal school app to record transactions, savings, reports, and display student progress in real-time	Facilitate monitoring, automated reporting, integrate technology in environmental education as well as efficiency, accuracy and transparency in waste bank operations

4.3. New Innovations in the Management Process of the SMK Strada II Waste Bank

4.3.1. Setting up a passbook

In order for the proceeds of waste sales to be managed transparently and provide benefits to students, the school initiated the establishment of the Strada Waste Bank and created a waste bank passbook system. With this system, each class or individual who deposits waste is clearly recorded the amount and type of waste, as well as the value of the money obtained. The money is kept in the form of savings, which can be disbursed or used for scholarships or certain social activities.

The Strada II Waste Bank, established on February 25, 2025, in accordance with Decree No. 229/SMK Strada II/SK/II/2025, the composition of the management of the SMK Strada II waste bank was formed at Jalan Tamansari VIII No. 83A, Tamansari District, West Jakarta. The composition of the waste bank management consists of the Principal, Vice Principal, Student Council Supervisor, Business Administrator, School Assistant, Security Guard, and Student Council Chair. The establishment of a waste bank is in order to invite and foster social concern for the environment, especially in waste management and greening, as well as waste reduction at TPS/TPA and economic empowerment of school residents and the community by utilizing waste with the 3R program (Reduce, Reuse and Recycle) and the behavior of school residents so that changes create a green, harmonious and independent environment.

The Strada Waste Bank accepts plastic bottle waste, paper, bottle caps, and used cooking oil. Organic waste produced from food scraps and leaves at school is used as compost and non-organic is sold at stalls or partners. The process of processing organic waste with a simple composter method produces *liquid* and compost, while non-organic waste is sold at a partner, namely the Satu Hati Waste Bank in Cengkareng West Jakarta.

As for used cooking oil, it will be sold to the Polar Social House. In addition, some used cooking oil is recycled at schools. The resulting product is bar soap (solid). This soap product is temporarily used by school residents themselves. In addition, this product is also exhibited as an innovative work. By displaying the results of this work, it provides a valuable learning experience for students. In this exhibition of innovative works, the school also introduced the existence of a Waste Bank in schools.

In order to strengthen the sustainability and attractiveness of the school waste bank program, a number of innovations were developed and offered at SMK Strada II. The first innovation is the digitization of the recording and reporting system through the "EcoStrada" application, which allows students and managers to monitor waste savings, transactions, and waste management progress in real-time. This digitization not only improves data transparency and accuracy, but also facilitates integration with points-based incentive programs that can be redeemed for rewards or additional value on certain subjects. The second innovation is the development of recycling-based creative products,

such as making bags, pencil holders, and plant pots from plastic and glass waste, which are marketed through school bazaars and online platforms. These products not only provide economic added value, but also become a means of learning contextual entrepreneurship for students.

In addition, the waste bank program is integrated into the entrepreneurship curriculum, where students are trained to design marketing strategies, conduct market analysis, and manage the simple finances of the proceeds of the sale of recycled products. Another innovation offered is the active involvement of external partners, such as MSMEs and the Environment Agency, in routine training and the development of marketing networks for environmentally friendly products. The program also adopts the "*Green Ambassador*" system, which is the appointment of students as environmental ambassadors who are tasked with educating peers and the surrounding community about the importance of waste management. With these various innovations, the school waste bank is expected to not only become a forum for education and waste management, but also a social entrepreneurship laboratory that is able to produce a young generation who care about the environment and have a creative spirit.

All activities carried out in the management of the Strada II Waste Bank, starting from recording savings, processing organic and non-organic waste, production of soap from used cooking oil, development of creative recycled products, digitization of the system through the "EcoStrada" application, to the integration of programs in the entrepreneurship curriculum are part of the Key Activities in the Business Model Canvas. These activities are core activities that create value for students and schools, both in terms of education, the economy, and the environment.

4.3.2. Waste Management Flow

SMK Strada II also introduced the Innovative Waste Bank by making flyers or through SMK Strada II social media, such as Instagram, TikTok, YouTube, and Facebook. The Strada Waste Bank activity is pictured in Figure 1.

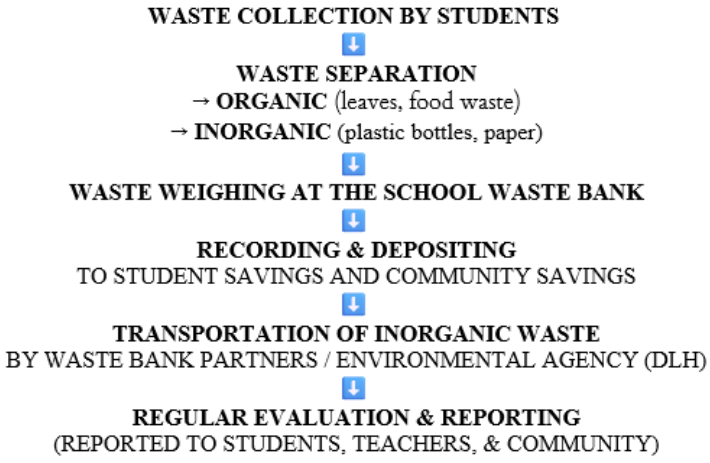

Figure 1. Strada Waste Bank Activity Flowchart

The Strada Waste Bank program is an environmental initiative that involves the active participation of students in waste management. The activity began with the collection of garbage by students, both from the school environment and their respective homes. The waste that has been collected is then sorted into two types, namely organic waste such as leaves and food scraps, and inorganic waste such as plastic bottles and paper. After the sorting process, the waste is weighed at the School Waste Bank to determine its weight and determine its economic value. The results of the scales are recorded and added to the savings of students and residents who participate. The inorganic waste that has been collected is then transported by the Waste Bank partner or the Environment Agency (DLH) for recycling or further processing. As part of transparency and evaluation, the school periodically reports the results of activities submitted to students, teachers, and residents. This activity not only encourages environmental awareness but also teaches the economic value of waste management and builds a culture of collective responsibility.

Activities in the Strada Waste Bank program from collection, sorting, weighing, recording savings, to reporting and collaborating with waste management partners show part of the Key Activities in the Business Model Canvas.

4.3.3. SMK Strada II Waste Bank Price Table

The waste price table prepared by SMK Strada II as part of the innovation of the Waste Bank program provides clarity and transparency on the economic value of each type of waste deposited. This innovation is part of the Value Proposition in the Business Model Canvas because it provides real benefits for students and school residents, namely in the form of appreciation for their contribution to waste management, increasing financial literacy, and motivation to continue to actively participate. Price clarity also fosters a sense of fairness, accountability, and entrepreneurial spirit which is an added value of this program.

Table 3. Prices of SMK Strada II Partner Waste Bank

No	Item Type	Purchase Price /kg	Selling Price /kg	Information
1	Plastic Bottles/A Bottles	IDR 6000	IDR 7000	White plastic beverage bottles and brand labels have been removed/excluded
2	Stripe The Mineral	IDR 4,500	IDR 5,500	Gallons of mineral water brand le minerale are only single-use.
3	Gallon Cap	IDR 7,000	IDR 8,000	All brands of mineral water gallons
4	Bottle caps	IDR 2,500	IDR 3,700	All plastic bottle caps
5	Toy	IDR 1,500	IDR 2,400	Unused plastic toys, used plastic bottles of shampoo, soap bottles, fragrances etc
6	Whiteness	IDR 1,000	IDR 2,100	Shredded white paper, envelopes, newspapers, magazines
7	Cardboard Box	IDR 1,000	IDR 2,150	Cardboard/cardboard made of paper and in dry condition and not mixed with other waste.
8	Magazine	IDR 500	IDR 1,200	Dry conditions and not mixed with other waste.
9	Book	IDR 500	IDR 1,100	Both white paper and stencil paper
10	Newspaper	IDR 500	IDR 1,200	Used newspapers are dry and not mixed with other waste
11	Tin	IDR 1,500	IDR 2,900	Made of aluminum material
12	Iron	IDR 3,000	IDR 4,000	Scrap metal, scrap metal, nails, other scrap metal tools
13	Wire	IDR 500	IDR 700	Wire cuts, copper, cable scraps
14	Glass bottles	IDR 100	IDR 250	Used glass bottles of drinks / food with intact and clean condition, both colored and clear.

5. Conclusions

In this study, it succeeded in developing an innovative model of the School Waste Bank was developed by combining the Business Model Canvas (BMC) approach with social entrepreneurship principles. The nine elements in BMC, the Value Propositions, Customer Segments, and Revenue Streams aspects, are an important part in creating a model that suits the school context. Why is that? Because this model not only focuses on waste management, but also develops educational, participatory, and socially impactful values.

In addition, the involvement of various parties (students, teachers, parents, and external partners) shows the importance of multi-stakeholder collaboration in the success of the Stada Waste Bank program. Meanwhile, the theoretical implications of this study contribute to the literature by bringing together BMC and social entrepreneurship in the context of education and the environment. This shows that innovative business approaches can be adapted for social and educational purposes without losing the essence of sustainability and its impact. The Strada Waste Bank model can be used by schools as an implementation guide to form sustainable and value-oriented waste bank units, while supporting the formation of environmental care characters and training students in real social entrepreneurship practices.

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