

Revolutionizing Food Waste Reduction: Indonesia's Gen Z Entrepreneurs' Innovative Business Ideas

Dr. NiLuh Widyaningsih¹, Tresya Febrinasari Naue²,
Dr. Elizabeth Furio Perez^{1*},
Esabella Marchelene Lovita Sudjono¹

¹ Department of Master in BioManagement, Indonesia
International Institute for Life Sciences, School of Business.

² Department of International Business Management,
Indonesia International Institute for Life Sciences, School of Business.

*Corresponding author: elizabeth.perez@i3l.ac.id

Abstract

The aim of the study was to describe Indonesia Gen Z's (people born in the late 1990s to the early 2010s) intention towards waste business management. This study was an extension of the previous research model by Huang et al. (2022), which examined the influencing factors of behavioral intention leading to sorting and recycling behaviors among youth. In order to provide empirical evidence from a developing country, the study used measurement instruments from Huang et al. (2022) and looked specifically at Indonesia, as the original research was conducted in developed countries (China and Finland). The research study was based on a qualitative approach, with active students from Indonesia International Institute for Life Sciences (i3L) as participants. The i3L has two main schools from life sciences and business school, which provided a good combination of students from a life sciences background and those studying business management, to create the Business Model Canvas (BMC) to reduce food waste.

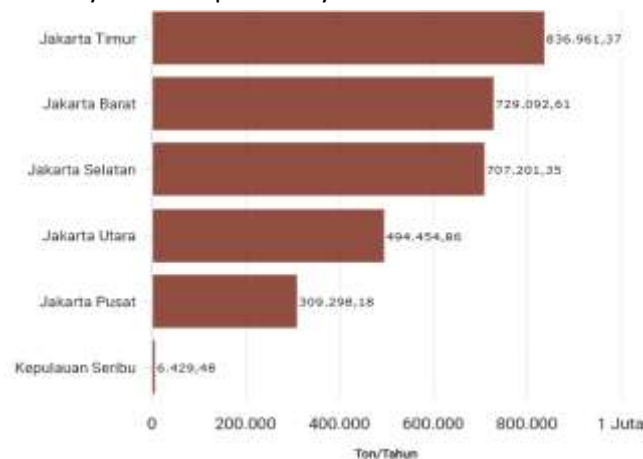
Keywords: Gen Z, business innovation, food waste, business model canvas, behavioral intention.

1.0 Introduction

Waste is a common problem that is prevalent in daily activities such as production and consumption (Karthikeyan et al., 2021). When not managed properly, waste can pose challenges to the environment and society. In Indonesia,

waste has become a major concern with its composition coming from food waste (42.3%), wood/leaf (17.4%), paper/board (12.5%), plastic (16%), and other materials (11.8%) (Ministry of Environment of Republic of Indonesia, 2022). The source of this waste originates from various sectors such as households (48.9%), offices (6.1%), traditional markets (15.5%), trade centers (8.1%), public facilities (8.9%), and other sources (12.5%). Among the various materials composing the waste, food waste has the highest percentage, and the primary source of waste is from households. Notably, Indonesia is listed as the second-largest producer of food loss and waste in the world, producing an estimated 300 kg per person annually (Ministry of National Development Planning or Bappenas, 2021).

Food waste is a common problem that emerges from food consumption, which is a fundamental human need. Household income plays a crucial role in determining the purchasing power and degree of spending for goods and services, with an increase in income generally resulting in an increase in spending (Widyaningsih et al., 2015). In examining consumption patterns, the household, which is the smallest social unit, can be used as an indicator. While food waste occurs at every stage of the food supply chain, households have been identified as the primary sources of this waste (Schanes et al., 2018). In East Jakarta, a significant amount of unmanaged food waste can be found in traditional markets and residential areas, with the highest amount of waste observed in East Jakarta compared to other regions within Jakarta (Katadata, 2022). Therefore, this study focuses specifically on food waste in East Jakarta.



Graph 1. Waste Volume in Jakarta 2021 (Katadata, 2022)

Waste can be broadly categorized into organic, inorganic, and hazardous waste. Organic waste refers to waste of biological origin that was once alive or a part of a living organism, such as food scraps, banana peels, and bread crusts (Karthikeyan et al., 2021). In contrast, inorganic waste is any waste that is not of biological origin, such as waste from industrial activities or non-natural processes. Hazardous waste, also known as toxic waste, poses a significant threat to the environment and society due to its potential to release dangerous substances, such as toxic chemicals and poisons (Technical Guidance WM2, 2021). As a result, hazardous waste is handled by the government to ensure proper disposal and reduce its negative impact on society.

To effectively deal with waste, it is important to identify the different types of waste and develop strategies for managing them sustainably. Organic waste can be composted to produce fertilizer that can be used to improve soil health, while inorganic waste can be recycled or repurposed to minimize its environmental impact (Graedel et al., 2011). Hazardous waste, on the other hand, requires specialized handling and disposal to prevent environmental damage and minimize health risks to individuals and communities (Technical Guidance WM2, 2021). By appropriately managing waste, we can reduce the negative impact on the environment and promote sustainable development.

According to Table 1, the total amount of waste generated in Jakarta has decreased over the years. From 2019 to 2021, the total amount of food waste has decreased from 7,702.07 tons to 7,233.82 tons, indicating a positive trend towards reducing food waste in the city. However, there has been a 15% increase in the total organic waste generated from 2019 to 2020, which was followed by a 4.7% reduction in the following year. In contrast, the total amount of inorganic and hazardous waste has shown consistent declines of 20% and 6.1%, respectively. This change could be attributed to the global pandemic of Covid-19, which led to an increase in household food consumption and a shift towards healthier food choices.

Despite the overall reduction in waste, it is important to address the issue of organic waste and explore strategies for sustainable management. As organic waste comprises the majority of waste generated in Jakarta, there is a need to explore innovative solutions such as composting and

recycling to minimize its negative impact on the environment (Sukandar et al., 2021). Furthermore, the government can engage citizens in campaigns and initiatives to reduce food waste generated at the household level, such as meal planning and composting. These efforts can contribute towards a cleaner and more sustainable environment in Jakarta.

Table 1. Waste Volume per Day Based on the Waste Type in Jakarta Province (Ton)

Waste Type	2019	2020	2021
1. Organic	3,519.14	4,078.28	3,888.19
2. Inorganic	4,139.86	3,466.79	3,305.20
3. Hazardous	43.07	42.41	40.44
Total	7,702.07	7,587.49	7,233.82

Source: Statistical Office (2022)

In their study, Pacino et al. (2021) underlined the importance of increasing student knowledge of food waste as a means of promoting changes in behavior that support environmental sustainability. Students represent the next generation and are, therefore, a critical target for any initiatives aimed at reducing waste and protecting our resources. The study also noted that when alternative preventive options are not feasible, encouraging public institutions to pay more attention to separate waste collection could help ensure that food waste is diverted towards material or energy recovery.

Against this background, this research paper seeks to identify innovative business ideas for reducing food waste, particularly organic waste, among Indonesia's Generation Z. Gen Zers, born between 1997 and 2012, are characterized by unlimited consumption and a growing concern for environmental sustainability (McKinsey & Company, 2018). The research will target active students in the Indonesia International Institute for Life Sciences (i3L) in East Jakarta, as this university has a waste management policy in place and offers relevant majors in business, food, and technology. The focus on active students at i3L is significant since this demographic is an important driver of change and a potential source of innovative solutions to environmental problems.

The selection of Generation Z for this research is well-founded. Studies have shown that compared to older

generations, Gen Zers demonstrate a greater inclination towards sustainable consumption patterns and an increased interest in supporting environmentally friendly business practices (Laverty et al., 2019, Kim & Choi, 2021). Therefore, focusing on this demographic could yield valuable insights into how innovative business strategies can effectively reduce food waste.

Furthermore, targeting active students at i3L is a sound approach since this university promotes sustainability through its waste management policy. Research has shown that universities can play a crucial role in transforming students' behavior and attitudes towards sustainable practices (Alam et al., 2018). By conducting this research in a university environment, we may be more likely to identify feasible and effective solutions that are suitable for implementation at both individual and institutional levels.

The focus on Generation Zers at i3L represents a valuable opportunity for the design and implementation of innovative business strategies to tackle the issue of food waste not just in Indonesia but also in other countries. As a demographic, Gen Zers are not only more conscious of sustainable consumption and show an increased preference for ethical and eco-friendly products but also have shown a greater inclination towards entrepreneurship (KPMG, 2020).

Furthermore, the research conducted at i3L could provide information and guidance to businesses and institutions on how to create and implement effective policies and practices for waste reduction. In fact, research shows that the development and implementation of strategies for waste reduction are crucial in addressing the issues of environmental degradation and resource depletion (Bonoli et al., 2018).

The focus on Gen Zers and i3L in reducing organic waste is seen as an innovative and practical approach to promoting environmental sustainability. The results of this research serve as a valuable resource for businesses, institutions, and policymakers seeking to address the issues of resource depletion and environmental degradation.

2.0 Literature Review

Business Innovation Idea

According to Pandiarajan (2022), business process innovation entails the introduction of a new or improved

business process that substantially differs from the firm's previous procedures. This covers all facets of business operations, including the creation of goods or services, logistics and supply chain management, advertising and sales, information and communication systems, and management and administration. On the other hand, innovation is the process of renewing and updating a domain, product, or service by implementing new processes, methods, or successful ideas to generate new value (Sawyer, 2012). This requires a creative thinking mindset that allows for taking risks rather than implementing ordinary projects.

Furthermore, creativity flourishes from open-mindedness, which promotes non-traditional thinking and creates room for learning from failures. The divergence of creative thinking can generate new processes and products and facilitate business growth, underscoring the strong connection between growth mindset, creativity, and innovation (Zhou and Rouse, 2021). Specifically, this research aims to investigate the business innovation concept of Gen Z to reduce food waste, as illustrated in the model below. The study will involve questioning i3L students to gather their thoughts, opinions, and ideas on reducing food waste.

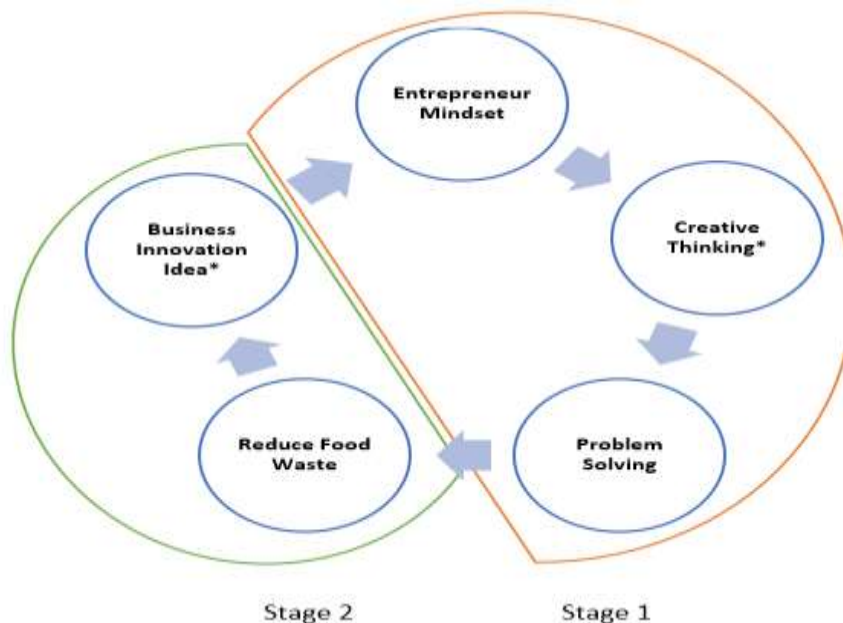


Diagram 1. Research Framework Business Innovation Idea to Reduce Food Waste

As indicated in Diagram 1, this research project consists of two stages. Stage 1 involves cultivating an entrepreneur

mindset that promotes creative thinking to solve problems and drive innovation. Generally, simple phases are used to accomplish this task, including problem formulation, alternative solution identification, solution selection, and impact analysis (ASQ, 2022). Brainstorming is useful for discovering new problem-solving approaches through innovation or modification of existing methods. Successful implementation of innovative ideas can offer various benefits such as improving financial profits, social responsibility, and reducing environmental degradation. These benefits can serve as motivators for individuals to strive for better results and strive to increase their quality of life. The primary data for the study will be gathered from active i3L students using open-structured questionnaires to describe the creative thinking used to reduce food waste. Stage 2, as illustrated in Diagram 1, builds on Stage 1 by classifying alternative solutions for reducing food waste into four groups. Through an in-depth interview with selected students, the goal is to refine the proposed ideas or solutions to be more specific, measurable, achievable, relevant, and time-bound, following the SMART framework (Samhsa, 2017). This includes specific areas of improvement, measurable indicators of progress, achievable actions, realistic results, and target timelines. According to various sources, food waste can occur before reaching the consumer (food loss) or after consumption (food waste) (Harvard T.H. Chan, n.d.; Fusion, n.d.). The Food and Agriculture Organization of the United Nations (FAO, 2011) offers a framework for understanding food loss, food waste, and food wastage, which can be caused by inefficiencies in food supply chains, natural disasters, and other factors. Implementing effective food waste management is crucial for sustainability and can offer cost savings on labor and energy, decreased methane emissions, and community benefits (Harvard T.H. Chan, n.d.). Research by Loke and Leung (2015) revealed that a considerable amount of food produced for human consumption is never used or is squandered by end users, thereby contributing to environmental and socio-economic issues. To address this problem, the promotion of Rescue-Based Food, which uses food that would typically go to waste, can provide a straightforward method for consumers to incorporate their prosocial preferences into their purchases (de Visser-Amundson et al., 2021). Concerning the Indonesian context, according to the

Ministry of National Development Planning (Bappenas, n.d.), the country generated 23-48 million tons of food waste between 2000-2019, or 115-184 kilograms per capita per year. This resulted in economic losses of Rp. 213-551 trillion annually, equivalent to 4-5% of the country's Gross Domestic Product (GDP) per year. Additionally, food waste contributed to 7.28% of the average Indonesia Greenhouse Gases. Hence, examining innovative business ideas for reducing food waste among Indonesia's Gen Z is crucial (Bappenas, n.d.).

Future Trend Solution

Achieving a sustainable food future necessitates addressing food waste through future solutions, as cited by Thought for Food (n.d.). Sustainable Development Goal 12, which emphasizes responsible consumption and production, includes two indicators for measuring global food loss and food waste reduction. Additionally, this research aligns with the strategic planning of i3L (Rencana Strategis or Renstra) for the research cluster number three, namely Innovation and Development Research (sub-cluster Business Innovation).

Numerous methods have been proposed by non-governmental organizations, government organizations, and other stakeholders to address food waste across the entire food chain, from product and packaging design to end-user or consumer food consumption. According to Deloitte's article, Future of Food (2022), potential food waste management strategies include product portfolio optimization to minimize handling and processing steps; supply chain design and capabilities that begin with raw material sourcing and supplier selection for minimal waste; digital capabilities like machine learning algorithms that can detect food quality degradation and waste; responsible consumption solutions such as collection and sharing of leftovers by consumers; dynamic pricing and promotion management; recycling and upcycling to re-purpose food byproducts and waste into feedstock for biochemical products; and other opportunities like donations to food banks.

Impact of Sensory Design on Reducing Food Waste

The hospitality industry has become one of the largest contributors to food waste in recent years. Addressing the issue of food waste is essential, not only to achieve

sustainable development goals but also to reduce the associated financial, environmental, and social costs. This study, conducted by M.A. Kolenic and M. Bren in *Acta horticulture*, examines the impact of sensory design and marketing communication on reducing food waste in the hospitality industry.

The study reveals that the senses, sight, taste, smell, touch, and sound play a significant role in a customer's experience and influence their food choices (Yansen, E. et. al, 2023). Sensory design, therefore, can be used as a tool to reduce food waste by enhancing customers' food experience. For example, well-designed menus with clear and concise descriptions can help customers make informed choices, leading to less food waste. Similarly, displaying fresh ingredients, cooking food on open flames or using live food stations can enhance the customer's experience, making them feel more connected to the food being served. Furthermore, paying attention to plating and garnishes can also make food more visually appealing, making customers more likely to consume all the food on their plates (Kolenic, MA & Bren, M. 2020).

3.0 Research Methodology

To gather business ideas from Gen Z on how to reduce food waste, a qualitative approach was used to survey active students at i3L. i3L comprises two major schools: the School of Life Sciences (SLS) and the School of Business (iSB). Out of a total of 405 students from both schools, the survey received responses from 23 Bio Entrepreneurship students, 10 International Business Management students, 147 Food Technology students, 85 Food Science and Nutrition students, and 140 Biotechnology students. The questionnaires were distributed through the students' organizations on campus and rigorous filtering was conducted to ensure that only responses from active students were accepted.

For the second stage of data collection, 20 active students will be segmented into four groups based on their responses from the previous stage. These groups represent major clusters of ideas for reducing food waste, as seen in Diagram 4. Data collection will take place in two phases, with the first phase scheduled for December 2022 to January 2023, while the second phase will occur in March to April 2023.

Below is the main cluster idea to reduce food waste:

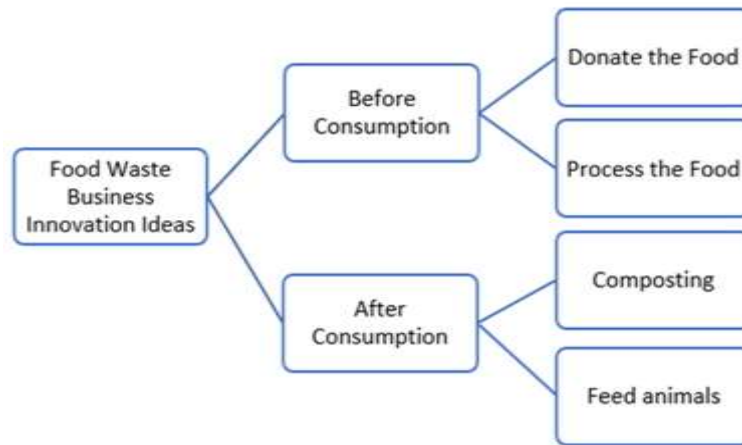


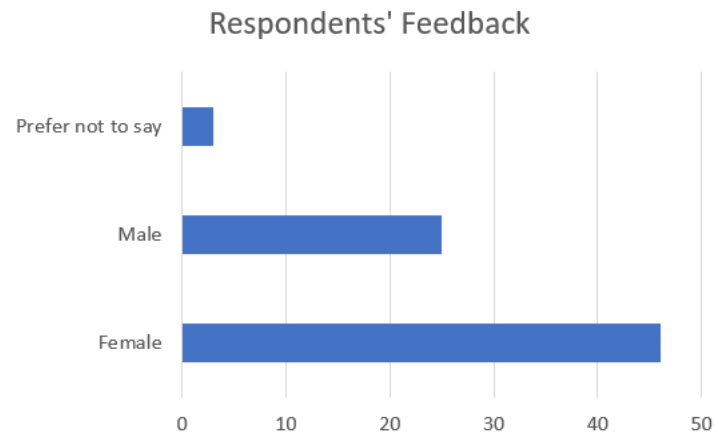
Diagram 2. Main Cluster to Reduce Food Waste

Business innovation ideas can be divided into:

- a. Before consumption. It means that before we consume our food, we can donate the abandoned food to people who need it and/or we can reprocess that food.
- b. After consumption. It means that we can compost the food waste in our house using a composter or we can go to the waste bank specific for treating the food waste, and we can feed the animals.

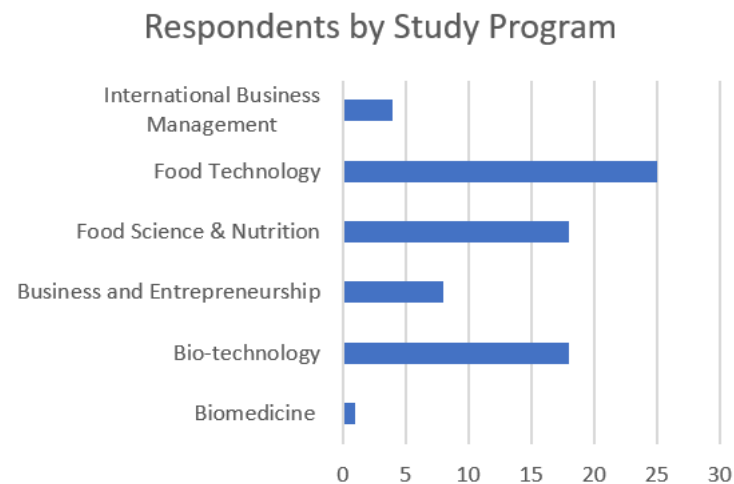
4.0 Analysis and Findings

Based on the feedback received via email (Google Form) from respondents, there are various challenges encountered. For instance, the term "creating BMC" was unfamiliar to students with a background in SLS, and the timing of distributing the questionnaire was suboptimal due to the proximity of final exams and end-of-year holidays. Additionally, some students faced difficulties due to their international internships. A total of 74 respondents provided feedback with certain characteristics, which are described as follows:



Graph 2. Respondents' Feedback Based on Gender

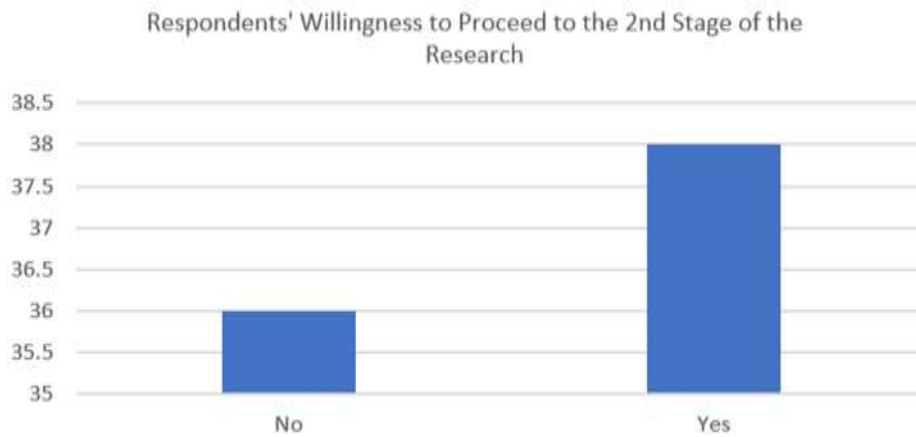
There are 46 females; 25 males, and 3 respondents who prefer not to mention their gender identity. For their background knowledge, we can see on the graph below:



Graph 3. Respondents by Study Program

In Graph 3, it is observed that FT has the highest number of participants with 25 students, followed by FSN and BT with 18 students each. BE has 8 students, IBM 4, and BM only has 1 student. After the first stage filter, 38 respondents are willing to proceed with the second stage of creating a Business Model Canvas (BMC).

Based on the data interpretation, it can be concluded that the majority of the participants are from the FT program. Additionally, it is evident that most students are willing to continue to the second stage and to create a BMC. However, the number of participants from other programs is also notable, implying that the survey reached a varied audience.



Graph 4. Respondents' Willingness to Proceed to the 2nd Stage of the Research

Some participants who were selected to proceed with the second stage of creating the BMC shared their thoughts on the profitability of turning food waste into a business opportunity. One participant named RF believes in creating a complete cycle system that converts waste materials into resources to produce future food. Another participant named TA suggests that food waste can be repurposed for plants or sold at a lower price to individuals interested in growing plants or feeding animals.

During the second stage, participants were given two weeks to develop their business ideas based on their knowledge, expertise, and off-campus internship experience. Two BMC results were obtained from the in-depth interviews with the respondents.

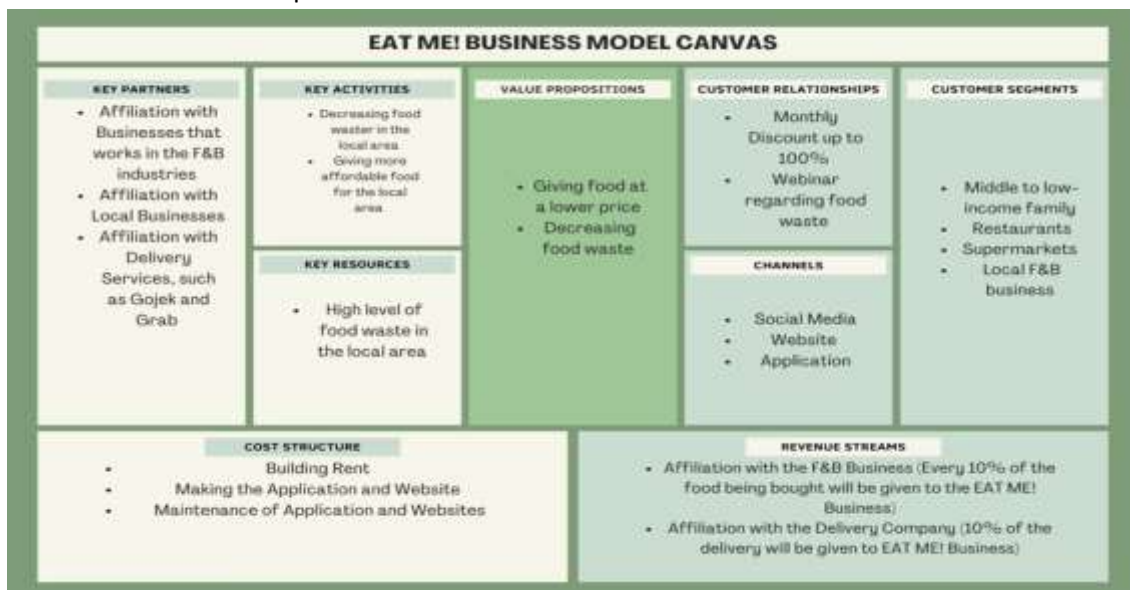


Diagram 3. Eat Me! Business Model Canvas (Alias: TA)

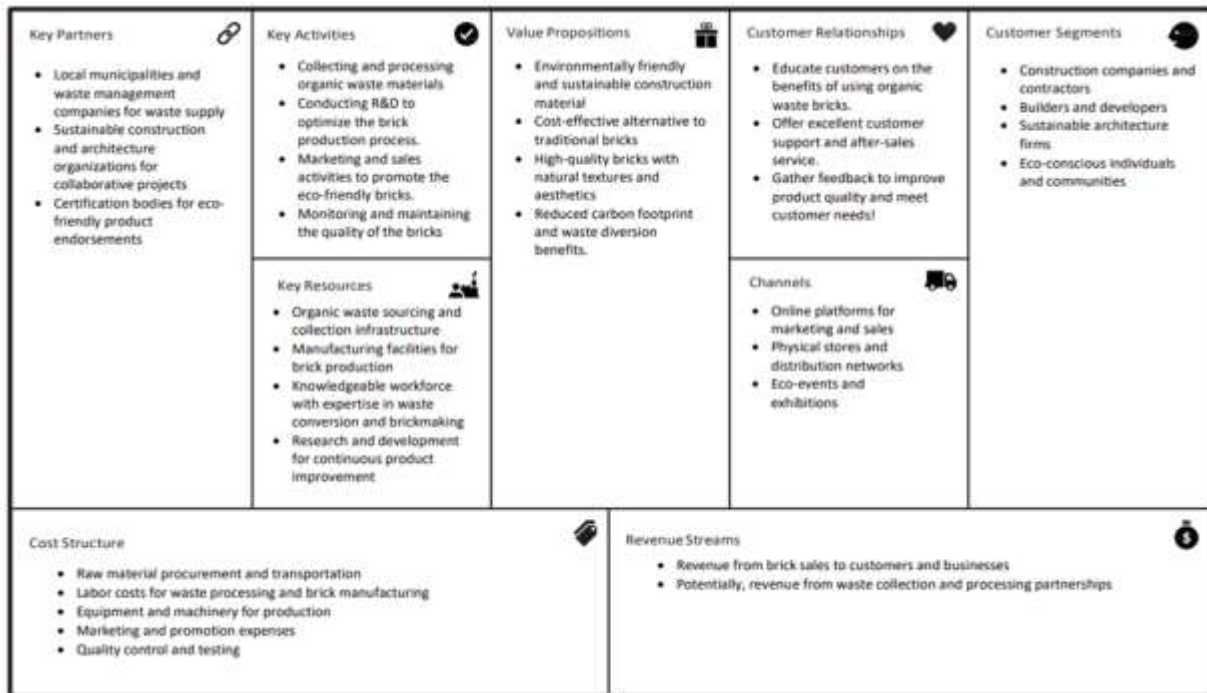


Diagram 4. Bio Composite Brick from Organic Waste (Alias: AA)

The finding that another respondent in the BMC study had a similar comment to the building app for reducing food waste is interesting and significant. It suggests that there may be a growing awareness and concern around reducing food waste, and that building an app to tackle this issue is a promising area of focus.

The respondent's similarity to the building app for reducing food waste could mean that there is potential for collaboration or partnerships between individuals and organizations who share a common interest in reducing food waste. Additionally, this finding could also imply that the development of a building app for reducing food waste could be a feasible and viable solution that would be well-received by users.

Further research could explore the different aspects of the building app for reducing food waste and the possible barriers to its implementation. It would be fascinating to see how the app could be developed to address the various concerns around food waste, and how it could be integrated into people's daily lives to create a sustainable and effective solution for reducing food waste.

5.0 Conclusions and Recommendations

The research project successfully identified the knowledge and understanding of Gen Z participants on food waste. They demonstrated an ability to manage food waste before and after consumption and integrate technology into their business ideas. They also acknowledged the value of sorting and collecting food waste.

The research aimed to identify viable business solutions for reducing food waste while leveraging available resources and individual team member abilities. Based on the outcome, the project will move forward with a pilot project based on the business plans developed during the research. Additionally, involving other stakeholders in i3L's larger program can enhance the project's scope and potential impact.

The research project highlighted the impact of Gen Z's innovative solutions towards reducing food waste and promoting environmental sustainability. With the implementation of the pilot project, Gen Z's innovative ideas have the potential to make a significant contribution towards sustainability and reduce the environmental impact of food waste.

The pilot project emerging from the research project has the potential to reduce food wastage in the community and promote sustainability. Collaborating with other stakeholders will strengthen the project's scope and lay the foundation for sustainability-related policy measures. The project's success has the potential to inspire future generations to take an active interest in promoting innovative and sustainable solutions for environmental sustainability.

This research project holds immense potential for addressing critical food waste issues in society. It is a testament to Gen Z's ability to make a significant and positive impact on society through innovative solutions that employ technology and sustainability practices.

The following **Conclusions and Recommendations** were derived from the results of this study.

5.1 Conclusions

The research project conducted on Gen Z participants was successful in identifying their knowledge and understanding of food waste. The participants were found to have a basic understanding of managing food waste before and after consumption. They were also able to integrate technology into their business ideas and

acknowledged the importance of sorting and collecting food waste. These findings can be useful in developing strategies for promoting environmentally sustainable practices, with the participation of Gen Z.

The research project's impact on reducing food waste and promoting environmental sustainability was significant. It demonstrated the potential for Gen Z's innovative solutions, which integrate technology and sustainability practices, to reduce food waste while supporting the environment. These insights can pave the way for developing sustainable solutions for food wastage, with the active participation of young people. As Gen Z continues to emerge as a demographic with a keen focus on environmental sustainability, the potential of their innovative ideas in this area appears tremendous. This research project can thus have far-reaching implications for the future of sustainable food practices and youth participation in this domain.

5.2 Recommendations

A pilot project will be implemented based on the business plans developed during the research project. This pilot project aims to reduce food wastage in the community and promote sustainability by implementing the insights and strategies identified during the research. The success of the pilot project can have significant implications for sustainable food practices and inspire more young people to take an active interest in promoting innovative solutions for environmental sustainability.

To enhance the project's scope and potential impact, other stakeholders must be involved in i3L's larger program. Collaborating with these stakeholders can strengthen the project's foundation and lead to the development of sustainability-related policy measures. This collaboration can also contribute to ensuring the project's sustainability and its long-term impact on reducing food waste. By involving a range of stakeholders, the project can benefit from diverse ideas, multiple resources, and broader support, which can help generate solutions to promote food sustainability and environmental conservation.

About the Authors

NiLuh Widyaningsih, is the Head of Master Bio Management at Indonesia International Institute for Life

Sciences and has a Doctoral degree in Environmental Economics and teaches business economics. She is an expert in waste management systems and contributes to i3L's sustainable solutions development. Widyaningsih is committed to educating her students to become future innovative professionals who promote environmental conservation.

Elizabeth Furio Perez is currently the Dean of Indonesia International Institute for Life Science (i3L) School of Business and holds a Doctorate in Business Administration. She has taught business subjects in various universities spanning across the Philippines, Vietnam, Myanmar, and UAE. Perez's current research delves into women entrepreneurship, stress management, consumer behavior, and marketing.

Tresya Febrinasari Naue, holds a degree in Master in Accounting from Monash University and is currently a faculty member of School of Business at Indonesia International Institute for Life Sciences.

Esabella Marchelene Lovita Sudjono holds a Master in BioManagement and is currently working as Head of Innovation and Entrepreneurship Department of Indonesia International Institute for Life Sciences.

References:

1. ASQ. (2022). WHAT IS PROBLEM SOLVING? ASQ. Retrieved December 23, 2022, from <https://asq.org/quality-resources/problem-solving>
2. Bappenas (n.d.). SUSTAINABLE FOOD WASTE MANAGEMENT CONTRIBUTES TO LOW CARBON DEVELOPMENT IN INDONESIA. Indonesia Green Growth Program. Retrieved December 23, 2022, from <http://greengrowth.bappenas.go.id/en/sustainable-food-waste-management-contributes-to-low-carbon-development-in-indonesia/>
3. BPS (2021). Volume Sampah yang Terangkut per Hari Menurut Jenis Sampah di Provinsi DKI Jakarta (Ton), 2019-2021. Badan Pusat Statistik. Retrieved December 23, 2022, from <https://jakarta.bps.go.id/indicator/152/916/1/volume-sampah-yang-terangkut-per-hari-menurut-jenis-sampah-di-provinsi-dki-jakarta.html>
4. BPS (2022, December 23). Istilah. Badan Pusat Statistik. Retrieved December 23, 2022, from https://www.bps.go.id/istilah/index.html?Istilah%5Bberawalan%5D=R&Istilah_page=4#:~:text=

Rumah%20tangga%20biasa%20adalah%20seseorang,makan%20bersama%20dari%20satu%20dapur

5. Deloitte. (2022). The Future of Food. Challenges & opportunities Perspectives from consumers and food companies. Retrieved from [future_of_food_2022_v2_consumer_deloitte_be_report_en.pdf](#)
6. de Visser-Amundson, A., Peloza, J., & Kleijnen, M. (2021). How association with physical waste attenuates consumer preferences for rescue-based food. *Journal of Marketing Research*, 58(5), 870–887. <https://doi.org/10.1177/00222437211031243>
7. Environment Agency, v1.2.GB Technical Guidance WM3: Waste Classification - Guidance on the classification and assessment of waste (2021). Bristol.
8. FAO. (2011). (rep.). Food losses and waste in the context of sustainable food systems (pp. 1–29). Rome, Italy: FAO.
9. Fushions (n.d.). FOOD WASTE DEFINITION. EU Fushions. Retrieved December 23, 2022, from <https://www.eu-fusions.org/index.php/about-food-waste/280-food-waste-definition>
10. Harvard T.H. Chan (n.d.). The Nutrition Source. Harvard School of Public Health. Retrieved December 23, 2022, from <https://www.hsph.harvard.edu/nutritionsource/>
11. Katadata (2022, May 20). Timbulan Sampah Tahunan Jakarta Timur Terbanyak di DKI Jakarta. Databoks. Retrieved December 23, 2022, from <https://databoks.katadata.co.id/datapublish/2022/05/20/timbulan-sampah-tahunan-jakarta-timur-terbanyak-di-dki-jakarta>
12. Kolenic, MA & Bren, M. (2020) "The Impact of Senses and Marketing Communication on Food Waste in the Hospitality Industry"
13. Loke, M. K., & Leung, P. S. (2015). Quantifying Food Waste in Hawaii's Food Supply Chain. *Waste Management & Research: The Journal for a Sustainable Circular Economy*, 33(12), 1076–1083. <https://doi.org/10.1177/0734242x15607427>
14. McKinsey & Company (2018, November 12). 'True Gen': Generation Z and its implications for companies. Retrieved December 23, 2022, from <https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/true-gen-generation-z-and-its-implications-for-companies>
15. Ministry of Environment of the Republic of Indonesia (2022, December 23). GRAFIK KOMPOSISI SAMPAH. Sistem Informasi Pengelolaan Sampah Nasional (SIPSN) – Kementerian Lingkungan Hidup dan Kehutanan. Retrieved December 23, 2022, from <https://sipsn.menlhk.go.id/sipsn/>
16. Ministry of National Development Planning/BAPPENAS (2021). Study Report: Food Loss and Waste in Indonesia; Supporting the implementation of circular economy and low carbon development. Indonesia Business Council for Sustainable

- Development. grasp2030.ibcsd.or.id/2022/07/07/bappenas-study-report-food-loss-and-waste-in-indonesia-supporting-the-implementation-of-circular-economy-and-low-carbon-development/
17. Pandiarajan, V. (2022). *Business innovation: A case study approach*. Routledge, Taylor & Francis Group.
18. Pereira, Daniel (2021, March 9). *Business Model Canvas: The Definitive Guide and Examples*. CONCEPTS Business Model Canvas: The Definitive Guide and Examples. Retrieved December 23, 2022, from <https://businessmodelanalyst.com/business-model-canvas/>
19. SAMSHA, (2017) *Setting Goals and Developing Specific, Measurable, Achievable, Relevant, and Time-bound Objectives*. Substance Abuse and Mental Health Services Administration. Retrieved December 23, 2022, from <https://www.samhsa.gov/sites/default/files/nc-smart-goals-fact-sheet.pdf>
20. Sawyer, R. K. (2012). *Explaining creativity: The science of human innovation*. Oxford University Press.
21. Schanes, K., Dobernig, K., & Gözet, B. (2018). Food waste matters - a systematic review of household food waste practices and their policy implications. *Journal of Cleaner Production*, 182, 978–991. <https://doi.org/10.1016/j.jclepro.2018.02.030>
22. The Thought For Food (n.d.). *Meet Invisible Foods: A European Startup Making Surplus in the Food Supply Chain a Thing of the Past*. Thought For Food. Retrieved December 23, 2022, from https://thoughtforfood.org/content-hub/meet-invisible-foods-a-european-startup-making-surplus-in-the-food-supply-chain-a-thing-of-the-past/?gclid=CjwKCAiAnZCdBhBmEiwA8nDQxRkPGHrb9CSHtIJ9UqZN5dq92_FnjNvxon40DzH3FalljERm822XXxoCmR0QAvD_BwE
23. Widyaningsih, N. L., Tjiptoherijanto, P., Widanarko, S., & Seda, F. S. S. E. (2015). Linkage model between sustainable consumption and household waste management. *Procedia Environmental Sciences*, 28, 195–203. <https://doi.org/10.1016/j.proenv.2015.07.026>
24. Yansen E, Perez, EF, Pradipta, A, Anvolia, K. (2023) *The Impact of Packaging Design on Sensory Attribute*, *Journal of Namibian Studies*, 35, s1
25. Zhou, J., & Rouse, E. D. (2021). *Handbook of Research on creativity and innovation*. Edward Elgar Publishing Limited.