

## BUSINESS MODEL CANVAS AND FINANCIAL FEASIBILITY ANALYSIS OF PUPUKIN!: A MULTIFUNCTIONAL SLOW-RELEASE ORGANIC FERTILIZER FOR URBAN FARMING

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### Abstract

Urban agriculture has been increasingly developed in response to the growing conversion of agricultural land into non-agricultural areas in urban regions. However, urban agriculture activities still face several challenges, particularly practical, efficient, and environmentally friendly fertilization practices. Pupukin! is an innovative, multifunctional slow-release organic fertilizer developed by utilizing organic waste materials such as banana corms, shrimp shells, and neem leaves as the main raw materials. This study aims to analyze the business model and financial feasibility of Pupukin! fertilizer business in supporting urban agriculture activities. The study employed a quantitative approach using the Business Model Canvas (BMC) to describe the business structure, as well as financial feasibility analysis, including production cost calculation, profit analysis, Revenue Cost Ratio (R/C Ratio), Payback Period (PP), and Return on Investment (ROI). The results indicate that the Pupukin! business model offers a key value proposition in multifunctional organic fertilizer that is practical, environmentally friendly, and efficient to use, making it suitable for urban agriculture practitioners. Financial analysis shows that the Pupukin! business is economically feasible, indicated by an R/C Ratio of 1.48. Furthermore, the business demonstrates a favorable investment return with an ROI of 48% and a relatively short Payback Period. These findings suggest that the Pupukin! fertilizer business has strong potential to be further developed as a sustainable agricultural innovation that supports the advancement of urban agriculture.

**Keywords:** Agribusiness; Business Model Canvas; Business Feasibility, Pupukin.

### INTRODUCTION

Urban agriculture has increasingly developed in response to the growing conversion of agricultural land to non-agricultural uses driven by urbanization and industrialization. In Indonesia, agricultural land conversion is estimated at 60,000–80,000 hectares per year, potentially reducing national food production capacity (IPB University, 2025). This condition has encouraged the emergence of various urban agriculture initiatives as an alternative for utilizing limited space in urban areas while also supporting household food security. Urban agriculture not only plays a role in providing food sources but also offers ecological benefits by improving environmental quality and promoting more productive utilization of organic waste.

However, urban agriculture activities still face several challenges in cultivation practices, particularly in fertilization. Fertilization is a crucial factor affecting plant growth and productivity, but not all urban farmers have sufficient time and knowledge to apply fertilizers appropriately. In 2024, market survey results of Pupukin! indicate that approximately 80% of 69 urban agriculture practitioners in Indonesia experience difficulties in fertilizing their crops, mainly due to time constraints and limited information regarding appropriate fertilizer types and dosages. This condition highlights the need for innovative fertilizers that are practical, efficient, and easy to apply in urban settings.

Pupukin offers a potential fertilizer with slow-release technology to optimize plant growth. Slow-release fertilizers gradually release nutrients over a certain period, thereby enhancing nutrient use efficiency and reducing the frequency of fertilizer application (Trenkel, 2021). With a more controlled nutrient release mechanism, this type of fertilizer is considered more effective in supporting plant growth while minimizing nutrient loss due to leaching or volatilization. Pupukin! is an innovative organic fertilizer developed as a multifunctional slow-

release product based on the utilization of organic waste materials, including banana corms, shrimp shells, and neem leaves (*Azadirachta indica*). The use of organic waste as fertilizer raw materials aims not only to improve soil fertility but also to add value to agricultural and fishery waste that has not been optimally utilized. This product is designed as a 3-in-1 multifunctional organic fertilizer that functions as a biofertilizer, biostimulant, and natural biopesticide, thereby supporting plant growth while helping to control plant pests and diseases.

Banana corms are utilized as a biofertilizer material due to their content of essential nutrients such as nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), and magnesium (Mg), as well as beneficial microorganisms that contribute to organic matter decomposition and soil fertility improvement. Several microbes found in banana corms include *Aeromonas* sp., *Bacillus* sp., and *Aspergillus niger*, which play roles in nitrogen fixation, nutrient solubilization, and suppression of plant pathogens (Arief, 2023). The potential of banana corm waste is substantial, considering that banana production in West Java reached approximately 1.6 million tons per year in 2021, generating up to 4.9 million tons of banana corm waste in 2023 (Statistics Indonesia, 2021; Taib et al., 2021).

In addition, shrimp shell waste also has significant potential as a raw material for organic fertilizer. Shrimp shell waste typically accounts for 35–50% of total shrimp production, meaning that from the 178,199 tons of shrimp produced in West Java in 2021, approximately 53,460 tons of waste can be generated (Maelaningsih et al., 2023; Statistics Indonesia, 2021a)). Shrimp shell waste contains chitosan, which functions as a biostimulant by promoting plant growth through plant hormones such as auxins, cytokinins, and gibberellins (Rachman et al., 2024). Meanwhile, neem leaves (*Azadirachta indica*) are utilized as a natural biopesticide due to their active compounds, including azadirachtin, salanin, meliantriol, and nimbin, which are effective in controlling various plant pests (Hasibuan et al., 2021).

The integration of these organic materials results in an innovative fertilizer that not only supplies nutrients to plants but also enhances plant growth and provides protection against pests and diseases. This innovation is expected to offer a practical solution for urban agriculture practitioners in conducting more efficient and environmentally friendly fertilization. Furthermore, the use of organic waste as fertilizer raw materials aligns with the principles of sustainable agriculture and supports efforts to reduce waste while optimizing resource utilization. Based on this background, this study aims to analyze the development of Pupukin! organic fertilizer innovation in supporting urban agriculture activities, and to evaluate the potential use of organic waste as raw materials for multifunctional, environmentally friendly, and sustainable fertilizers.

## RESEARCH METHODS

### Research Type and Design

This study employed a quantitative approach with a case study design, using Pupukin! as the unit of analysis. The research design aimed to examine the business model and financial feasibility of the enterprise within the context of agribusiness development. The population in this study included 69 urban agriculture practitioners and potential consumers of organic fertilizer products. Sampling was conducted using a purposive sampling technique. The variables observed in this study included business model components, production costs, revenue, profit, and financial feasibility indicators.

### Location and Time of Research

The study was conducted at two main locations: 1) The Pupukin! production site in Jatianangor, Sumedang Regency, and 2) The Soil Chemistry and Plant Nutrition Laboratory, Faculty of Agriculture, Universitas Padjadjaran. The research took place April to August 2024.

### Data Analysis Technique

Data analysis in this study was carried out using both descriptive and quantitative approaches. Descriptive analysis was used to explain the business model of Pupukin! based on the Business Model Canvas (BMC), which includes nine components: value proposition, customer segments, channels, customer relationships, revenue streams, key resources, key activities, key partnerships, and cost structure.

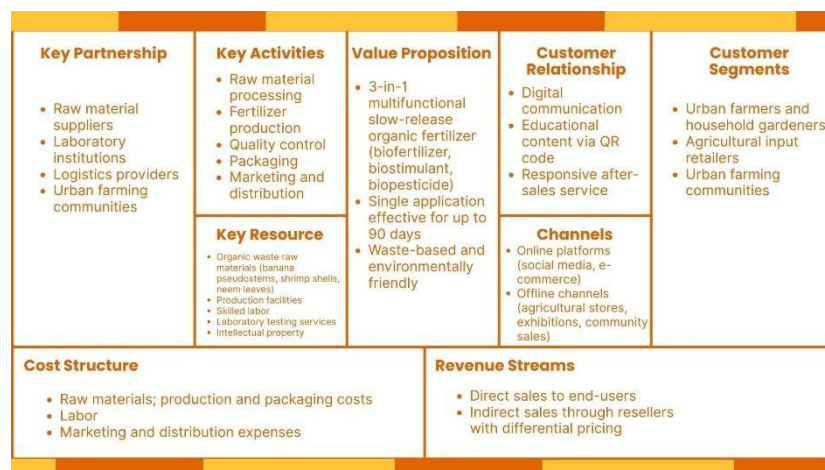
Quantitative analysis was applied to evaluate the financial feasibility of the business. The analysis included the calculation of production costs, total revenue, and profit. Furthermore, several financial indicators were used, including Revenue Cost Ratio (R/C Ratio), Payback Period (PP), and Return on Investment (ROI).

These analytical methods were used to assess the economic viability and agribusiness potential of Pupukin!, as well as to determine whether the business is feasible and sustainable for further development.

## RESULTS AND DISCUSSION

### Business Model Canvas

The results of this study indicate the development of the Pupukin! business model aligns with the research objective to analyze the agribusiness potential of waste-based organic fertilizer in supporting urban agriculture. The Business Model Canvas (BMC) analysis shows that the main value proposition lies in offering a multifunctional slow-release organic fertilizer that is practical, efficient, and environmentally friendly. This finding explains why the product is relevant to urban agriculture practitioners, who often face limitations in time and technical knowledge. From a theoretical perspective, a strong value proposition is a key element in agribusiness competitiveness, particularly in input markets where product differentiation determines consumer preference (Nazil et al., 2017). The results of this study are consistent with previous research from Saptaria et al., (2022), indicating that the application of BMC in organic fertilizer businesses can improve market reach and business sustainability. However, this study provides a different contribution by integrating multifunctional product innovation with urban agriculture needs, which has not been widely discussed in previous studies.



**Figure 1.** Business Model Canvas Analysis  
(Source: Primary Data Analysis, 2024)

### Market Analysis and Agribusiness Opportunities

The findings reveal that there is a significant gap between market needs and the availability of appropriate fertilizer products. Approximately 80% of 69 urban agriculture practitioners experience difficulties in fertilization, mainly related to efficiency and knowledge.

This result directly supports the research objective of identifying opportunities for developing innovative agricultural inputs. This condition can be explained by the increasing demand for sustainable agricultural products, driven by changes in consumer preferences toward environmentally friendly and high-quality inputs. This study confirms that urban agriculture creates new agribusiness opportunities, especially for products that combine practicality and sustainability. This research emphasizes the importance of aligning product innovation with market demand.

### Production Cost and Profit Analysis

The results show the production cost of Pupukin! is relatively efficient due to the use of organic waste as raw materials. The calculated profit margin indicates that the business is economically viable. This finding answers the research objective related to financial feasibility and demonstrates that waste-based production can reduce costs while maintaining product value. Cost efficiency is a critical factor in agribusiness sustainability. The use of low-cost raw materials contributes to higher profitability and competitiveness. This result is consistent with previous studies by Mutiarasari & Nirwanto (2022), who state that organic fertilizer businesses utilizing waste materials can significantly reduce production costs and increase economic value. Compared to other studies, this research highlights a unique aspect: the integration of multifunctional product features that provide added value beyond cost efficiency.

### Cost and Production Price Analysis

A production cost analysis was conducted to determine the total costs incurred in the production process of Pupukin! fertilizer. Production costs consist of fixed and variable costs incurred during production over five months, with a total output of 478 units.

**Table 1.** Data Cost and Production Price

Product Type	Cost of Products	Selling Price	Margin
Pupukin! ( <i>end-user</i> )	Rp20.200,00	Rp29.900,00	Rp9.700,00
Pupukin! ( <i>reseller &amp; consignment</i> )	Rp20.200,00	Rp25.000,00	Rp4.800,00

(Source: Primary Data Analysis, 2024)

### Feasibility Analysis

A feasibility analysis was conducted to determine whether the Pupukin! fertilizer business, which has been in operation for five months, is economically viable. This analysis was performed using several indicators, including operating profit and Revenue-to-Cost Ratio (R/C Ratio).

**Table 2.** Data Feasibility Analysis

Components	Value
Total Cost	Rp10.100.000,00
Total Revenue	Rp14.950.000,00
Profit	Rp4.850.000,00
R/C Ratio	1,48

(Source: Primary Data Analysis, 2024)

The analysis results show that the R/C ratio is greater than one ( $R/C > 1$ ). This value indicates that the Pupukin! fertilizer business is economically viable because business revenue exceeds production costs. This finding aligns with previous research stating that organic fertilizer

businesses based on waste have good economic potential if managed efficiently and have the right marketing strategy (Zikria & Nasrullah, 2024).

### Business Investment Analysis

In addition to the business feasibility analysis, this study also analyzes investment feasibility using the Payback Period (PP) and Return on Investment (ROI) indicators. This analysis is used to determine the rate of return on investment in Pupukin! fertilizer business.

**Table 3.** Data Business Investment

Components	Value
Total Investasi	Rp10.100.000,00
Payback Period	1,81
Return On Investment	48%

(Source: Primary Data Analysis, 2024)

The analysis results show that the Pupukin! fertilizer business has a relatively short payback period and a positive ROI. An ROI of 48% indicates the return on investment for the Pupukin! business is high, suggesting that the business has good prospects for expansion to a larger scale of production. Additionally, the use of organic waste as the primary raw material offers an added benefit by reducing production costs while supporting the concept of a circular economy in the agricultural sector.

### CONCLUSIONS AND SUGGESTIONS

Pupukin! Organic Fertilizer Business has a business model with significant potential for development to support urban farming activities. An analysis using the Business Model Canvas indicates that the core value offered by Pupukin! is a multifunctional, waste-based organic fertilizer that is practical, environmentally friendly, and efficient to use. The primary market segments for this product are urban farmers, plant enthusiasts, and ornamental plant communities who require fertilizers that are easy to use and sustainable.

Financial analysis results indicate that the Pupukin! business is economically viable. A Revenue-to-Cost Ratio (R/C Ratio) of 1.48 indicates that every one rupiah of production cost generates 1.48 rupiah in revenue. Investment analysis also shows that this business offers a satisfactory return on investment, with a Return on Investment (ROI) of 48% and a relatively short payback period.

Based on these results, the Pupukin! organic fertilizer business has good potential for further development as a product innovation that supports urban agriculture while more optimally utilizing organic waste. Therefore, business development can be pursued through increased production capacity, strengthened digital marketing strategies, and expanded product distribution networks. Additionally, further research can be conducted to analyze the effectiveness of Pupukin! fertilizer on plant growth across various urban farming crops and to assess the potential for business development on a broader industrial scale.

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