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The Financial Feasibility Analysis Of Organic Waste Processing Business At The Central Market (Case Study: Kemang Market (Tu) Bogor City)

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Abstract

Waste management poses a significant challenge in addressing the waste problem. PT BTS introduces SWASPRO (Smart Waste Processing) program, offering innovative solutions to waste management aimed at reducing the amount of waste sent to landfills. This study aims to determine whether SWASPRO is an optimal alternative for waste management, assess its financial feasibility, and evaluate the sustainability status and policy directions of waste management. Data in this study will be analyzed using the Google Worksheet Financial Feasibility Analysis and Sustainability Analysis with the help of EXsimpro software through the Multiaspect Sustainability Analysis (MSA) technique. The results show that SWASPRO is a viable program to implement.

Keywords: financial feasibility study, sustainability analysis, organic waste processing, smart waste processing

1. INTRODUCTION

Waste is one of the most complex problems faced because the amount is directly proportional to the amount of population growth which is increasing every year, this causes problems related to environmental hygiene (Gunamantha & Sarto, 2012; Zhang et al., 2022). Waste also causes a pungent odor that disturbs comfort and even increases the spread of disease (Chandra, 2024; Kibria et al., 2023). Waste is an unending problem. As long as

humans live, humans will produce waste through daily activities, from household activities to industrial activities that produce organic and inorganic waste, coupled with an increase in population which also results in an increase in the amount of waste (Ellyzabeth Sukmawati et al., 2022; Kibria et al., 2023; Siddiqua et al., 2022). Basically, waste and its problems will continue to exist because of human activities, so that every year it can be ascertained that the volume of waste will continue to grow along with the increasing consumerism patterns of society (Chandra, 2024). Waste is an unending problem. As long as humans live, humans will produce waste through daily activities, from household activities to industrial activities that produce organic and inorganic waste, coupled with an increase in population which also results in an increase in the amount of waste. Basically, waste and its problems will continue to exist because of human activities, so that every year it is certain that the volume of waste will continue to grow along with the increasing consumerism patterns of society (Chandra, 2024).

Waste is generally divided into two types, namely organic waste and inorganic waste (Fadhullah et al., 2022; Schanes et al., 2018). Organic waste is made from natural materials and can decompose, such as leaves, food scraps, leftover fruits and so on. Meanwhile, inorganic waste is made from a mixture of chemicals and does not decompose such as plastic, aluminum, iron, metal and so on. Household waste and other human activities that generate waste or garbage will have an impact on the decline in environmental quality because if the waste is not handled properly, it will make the environment polluted (Chang & Li, 2019; Fang et al., 2023).

The large population and diversity of activities, especially in big cities, have led to problems in urban infrastructure services, one of which is the problem of waste in Bogor City. Bogor City located in West Java, with an area of 11,850 ha, which is 0.27% of the area of West Java. The total population in Bogor City is 1,137,859 people (DPPKB Bogor City) so that it has the potential to produce high waste generation. In Bogor City, precisely in the Tanah Sereal Sub-district area, there is the largest wholesale market in Bogor City which has a high waste potential, and could be said that the Tanah Sereal Region has an urgent waste management problem or needs to be addressed immediately.

The current landfill in the Bogor region is called the Galuga landfill in Cibungbulan. Until now, waste has only been collected for disposal in this landfill, and then dumped or burned. Seeing the various problems regarding waste, it is very necessary for us to process and utilize waste to become more useful (Hidayanti, 2022).

Seeing this problem, solutions and innovations are needed to overcome these problems, namely with the emergence of vendors engaged in waste processing, namely PT Bumi Tanpa Sampah (PT BTS) with their program called SWASPRO (*Smart Waste Processing*). SWASPRO

is a waste processing system program by placing a series of waste processing machines in a location that produces a lot of waste and has limited space. The SWASPRO Zero Waste Program system will process waste to Zero Waste, so that no more waste will be transported to the TPA (Final Disposal Site). The SWASPRO Program plan will first be implemented in Tanah Sereal sub-district of Bogor, spesifically at Kemang Market (TU) in Bogor City, which is the largest wholesale market in Bogor City. With an area of ± 3.2 ha. The reason the researchers chose the market in this study is because within its scope, waste management is certainly easier and more effective. Kemang Market (TU) has a total of 21 shophouses, 100 stalls and 1508 stalls.

Therefore, more details about the production results of organic waste processing are as follows Chandra (2024), starting from organic waste generated from Kemang Market (TU) will be ground into organic slurry and separated by water content and sold to BSF Maggot farmers. Organic waste from Kemang Market (TU) will be collected at one point. Organic waste that has been sorted will be milled with a Crusher Machine to become organic slurry. The organic pulp that has come out of the Crusher Machine will be separated from the water content using a Screw Conveyor machine. This method in the long run will reduce the burden on the Galuga landfill, so that in the end Bogor City does not depend on the final processing site and achieves independence in waste management. If optimized properly, the SWASPRO program can contribute economic benefits and waste reduction

Linear economy is a system of economic activity that is implemented with a 'take-make-use-dispose' cycle, where resources are extracted from the earth (take), then processed to become a product (make), then the product is consumed (use) and immediately disposed of when the product no longer has a use value (waste) (Ritchie, K.J. dan Freed, 2021). While the concept of circular economy recognizes the 'take-make-use- return' cycle (Ritchie, K.J. dan Freed, 2021), where resources are taken responsibly (take), then processed into a product (make), then the product is used by continuing to maintain its value (use) and at the end of its life the product is returned to be processed into a new product (return) (Shirvanimoghaddam et al., 2020). In the circular economy there is an approach known as the 5R principle, which consists of five elements namely: Reduce, Reuse, Recycle, Refurbish, and Renew. In waste processing business activities, of course, the process must look at the feasibility of the business and the sustainability of the business. Business feasibility analysis is carried out in order to find out how much profit, break-even point (BEP), and also return on investment from a business, so that business feasibility analysis can be said to be useful for business actors and prospective business actors.

Quantitative analysis or financial feasibility analysis in business feasibility is used to analyze financial aspects, especially for analyzing the feasibility of its investment with a

projection of the next five years (Istiyani & Lisaputra, 2022). In addition, each feasibility criterion can be used to determine the sequence of various business alternatives of the same investment (Samsurijal Hasan, Elpisah, Joko Sabthohadi, Zarkasi, 2020). Some of these criteria include net Present Value (NPV)is Net Present Value or the present value of net benefits is the difference between total benefits and total costs at present value (PV). Internal Rate of Return (IRR) A number which the discount rate (DR) that results in NPV equal to zero. The amount generated from this calculation is in percentage (%). A business is said to be viable if its IRR is greater than its opportunity cost of capital (DR). Net Benefit Cost Ratio (Net B/C): Ratio of positive net benefits to negative net benefits. A business or investment activity can be said to be feasible if the Net B / C is greater than one and is said to be unfeasible if the Net B / C is smaller than one.

Based on the problems described above, the objective of this paper is to provide an overview of the smart waste process, to do analytical financial feasibility of organic waste processing business at Kemang Market (TU) Bogor City, and provide the assessment of sustainability status and policy direction in organic waste processing at Kemang Market (TU) Bogor City.

2. RESEARCH METHOD

This research will be conducted at Kemang Market (TU) which is located at Jalan Raya Sholeh Iskandar RT.02/RW.01, Cibadak, Kec. Tanah Sereal, Bogor City, West Java 16166. This research was conducted under the vendor PT BTS from May to August 2024. The selection of the research location was carried out purposively with the consideration that PT BTS is a business entity in the form of a company that carries out market waste processing production activities and able to empower the community. Then, the reason why Kemang Market (TU) chose as the object of research is not only because of the SWASPRO program, but also because Kemang Market (TU) has collaborated with IPB's LP2B (Sustainable Food Agricultural Land) foundation and Kemang Market (TU) is the largest organic waste producing market in Bogor City (Interview with Manager), making it interesting to research and relevant to this research.

The type of data used in this research is primary data which is the main reference for the author in this study, the primary data used is the results of interviews and FGDs (Focus Group Discussions). The primary data was obtained through direct observation of the activities carried out by PT BTS as a whole and in-depth interviews with eight respondents who are authorities at PT BTS. Secondary data in this study is in the form of information regarding the potential for waste management development. In addition, other secondary data will be obtained from book references, journals and research, internet sites and related

agencies such as the Central Bureau of Statistics, the Bogor City Environment Office, and the National Waste Management Information System.

The technique of taking respondents in this study was carried out by purposive sampling because the respondents were key informants or experts who best knew the information needed in this study. Respondents can be selected based on their respective capacities / expertise both within the company and outside the company. To find out that the SWASPRO program is able to become an alternative for waste management, a qualitative descriptive analysis was conducted. The analysis method used to analyze the financial feasibility of the waste management business uses feasibility analysis. The method used to formulate a sustainable waste management business is implemented in Exsimpro software through the Multiaspect Sustainability Analysis (MSA) technique (Chugunov & Makohon, 2019; Firmansyah, 2022).

Financial feasibility analysis aims to see the extent to which the results of investment activities of a planned project can provide benefits. In achieving project objectives, it is necessary to estimate the benefits and estimate the costs used to describe the financial position in the future. Determining the present value of benefits and costs that will occur in the future is done through a weighting called a discount factor. This research uses a comparison of present value and future value, or what is called the time value of money. According to Nurmalina (2014) the calculation of conversion on the components of the value of costs and benefits is formulated in the following way:

1. Discounting

$$\text{NPV} = \sum_{t=1}^{n} \frac{B_t - C_t}{(1+i)^t} \quad \ldots\ldots\ldots\ldots\ldots (1)$$

Discounting is a calculation method that converts a value in the present when a certain value in the future is known. Mathematically, the calculation of discounting is formulated as

$$Present\ Value\ (P) = F\ \frac{1}{(1+i)^n}$$

follows:

Description:

F : Future Value (rupiah)

i : Discount rate (%)

n : Time period (years)

2. Compounding Factor

Compounding is a calculation method that converts a future value when the current value is known for a certain period of time. Mathematically, the compounding calculation is formulated as follows:

Description:

$$Future\ Value\ (F) = P(1+i)^n$$

P : Present Value

i : Discount rate (%)

n : Time period (years)

The feasibility analysis of the benefits and costs in the organic waste processing process is carried out financially by assessing the feasibility criteria consisting of Net Present Value (NPV), Net Benefit Cost Ratio (Net B/c), and Internal Rate Return (IRR) without examining in depth the non-financial aspects (technical aspects, social aspects, managerial aspects, and commercial aspects). According to Gittinger (1982), the feasibility criteria are formulated as follows:

3. Net Present Value (NPV)

Net Present Value or net profit is obtained by subtracting gross revenue from total costs so that PV benefit minus PV cost, which means the estimation of future benefits and costs relative to the present. This is calculated by multiplying the benefit and cost components by a discount factor. The following is the NPV formula used in this study:

Description:

Bt: Revenue earned by the project in year t (rupiah)

Ct: Costs incurred by the project in year t (rupiah)

n : Economic life of the project

i : Discount rate (%)

t : Project investment year (t = 0, 1, 2, ..., n)

The results of the NPV calculation are then assessed according to the following criteria:

1. NPV < 0, indicates that the project is not financially feasible because the benefits obtained are less than the investment costs that have been incurred.
2. NPV> 0, indicating that the project is feasible to implement because the benefits obtained are greater than the investment costs that have been incurred.
4. NPV = 0, indicating that the project is feasible to implement but has difficulties because the benefits obtained will only be enough to replace or cover the investment costs.

5. Net Benefit Cost Ratio (Net B/C)

The Net B/C concept is a comparison between positive net benefits that have been discounted (positive NPV) and negative net benefits that have been discounted (negative NPV). The Net B/C value can be obtained using the following formula:

Description:

Bt: Revenue earned by the project in year t (rupiah)

$$Net\ \frac{B}{C} = \frac{\sum_{t=1}^{n} \frac{Bt-Ct}{(1+i)^t} > 0}{\sum_{t=1}^{n} \frac{Bt-Ct}{(1+i)^t} < 0} \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Ct: Costs incurred by the project in year t (rupiah)

n : Economic life of the project

i : Discount rate (%)

t : Project investment year (t = 0, 1, 2, ..., n)

A project can be said to be feasible if Net B / C> 1 and is said to be unfeasible if Net B / C < 1. A project with Net B / C = 1 means that cash inflow is equal to cash outflow or in present value it is called a break-even point (BEP), that is, total cost is equal to total revenue.

6. Internal Rate of Return (IRR)

The internal rate of return is explained as the maximum interest rate that a project can pay as a measure of return on resources used. IRR indicates the average annual internal rate of return of the company carrying out the investment and is expressed in percent. IRR is the interest rate at which the NPV value equals zero. The IRR value is obtained by the following formula:

Description:

Bt: Revenue earned by the project in year t (rupiah)

$$\text{IRR} = \sum_{t=1}^{n} \frac{B_t - C_t}{(1+i)^t} = 0 \quad \ldots\ldots\ldots\ldots\ldots (3)$$

Ct: Costs incurred by the project in year t (rupiah)

n : Economic life of the project

i : Discount rate (%)

t : Project investment year (t = 0, 1, 2, ..., n)

This study used qualitative principles to study training as a catalyst to KM and tax administration efficiency. Qualitative approach is suitable when a research provides answers to “how” and “why” research questions (Yin, 2009). Therefore, a qualitative approach is suitable as this provides an answer to how formal and informal training improve KM and tax administration efficiency. Federal Inland Revenue Service (FIRS) Abuja in Nigeria

was used as a single case study. A single case study is suitable when it represents a "critical case" to test the circumstances under study (Gerring, 2007; Mansor, 2011). Hence, FIRS Abuja can represent a "critical case" in testing how training improves KM and tax administration efficiency because KM implementation in tax administration is limited. On the other hand, tax revenue generation in FIRS is low (OECD, 2019) as an indicator of administration inefficiency; hence, justify its selection as a single case study to represent tax administration.

In qualitative research, ethical consideration is critical; hence, this study follows ethical consideration and applied to the chairman FIRS to collect data, and was approved. A copy of the interview protocol was attached to the application. After approval, the head of planning, research and statistics selected tax officers from different departments, groups and cadres to participate in the interview based on knowledge and experience in training and KM in tax administration. Twenty (20) tax officers who are involved in training and the KM process were interviewed face-to-face in their offices in FIRS.

The participants were drawn from training, domestic taxes, modernization, corporate development, enforcement and compliance groups. Sample size for this study is 20 tax officers who were interviewed face-to-face in FIRS. Saturation level of sample size for this study is based on Bernard (2013) who said between 10 and 20 participants is a saturation level for a case study interview. Semi-structured, and open-ended interview questions were employed to collect data face-to-face. The data collection process lasted for six months. Interview protocols were made available to the participants prior to the interview session to enable them understand the objectives of the study. Before the interview session, the aims of the study were explained to the participants and were assured of confidentiality of their information. The interview session took place in offices of the participants which lasted between 30 to 40 minutes depending on the responses. Sub-themes for formal and informal training emerged in the process of face-to-face interview which include induction, inspector of taxes for formal, and "train the trainer", technical session for informal training. According to Creswell (2007), qualitative research process is emergent as new themes and processes can emerge. Qualitative research involves understanding an issue or problem from a participant's perspective to provide answers to research questions, and objectives (Creswell, 2007).

A Smart voice recorder was employed to record the interview. The recorded interview was complemented with notes that were taken by the researcher with a pen. Data validity and reliability were important; therefore, interview data were presented to the participants to confirm whether the transcribed interview data were the same with their statements, and participants agreed to conformity of transcribed data with their statements. In addition,

documentary study of FIRS annual schedule of training was used to validate interview data. Thus, this study employed data triangulation for analysis. In continuation, data were analyzed with NVivo version 10 qualitative software. Thematically, data were analyzed via the process of interview transcription, coding of data, selection of themes, and identification of connection between themes. Data were categorized into two main themes as formal and informal training based on responses and objectives of the study. Formal and informal training as main themes were categorized into induction and inspector taxes for formal, and "train the trainer" and technical session for informal training as sub-themes. Result of data collection is presented in the next section.

3. RESULT

At the start of SWASPRO implementation, expressed as year 0, PT BTS requires initial investment costs for the procurement needs of other cost components, the allocation of which is detailed in Table 1.

Table 1 Initial Investment Cost Components

Number	Cost Component	Amount (Rp)
1	Land Lease for Processing	Rp20.000.000
2	Building Lease for Production Workshop	Rp70.000.000
3	Procurement of Machinery and Equipment	Rp213.243.330
4	Technology and Software Development	Rp71.081.110
5	Research and Development	Rp35.540.555
6	Permits and Legal Compliance	Rp71.081.110
7	Initial Marketing	Rp35.000.000
8	Contingency Fund	Rp142.162.220
	Total	Rp 658.108.325

Initial Investment Costs refer to initial requirement or expenses to start and run operations. In addition to these components, there are also operational support components that are also needed in the implementation of the SWASPRO program, which include Waste Processing Building Rent, and Machinery and Equipment. Beyond the mentioned components, ancillary land and building costs are necessary for the execution of the

SWASPRO program. The values corresponding to these costs, categorized as 'Other Supporting Costs', are itemized in Table 2.

Tabel 2 Other Supporting Cost Components

Number	Cost Component	Amount (Rp)
1	Electrical Installation	30.000.000
2	Waste Processing Area Set Up	15.000.000
3	Workshop Renovation	30.000.000
4	Working Capital	20.000.000
5	Maggot Cultivation Cost	30.000.000
	Total	**125.000.000**

Therefore, based on the details of these supporting cost components, the implementation of SWASPRO in year 0 requires a capital funding of Rp 783,108,325. The entire funding source will come from company equity. Consequently, in subsequent periods, PT. BTS management needs to secure at least the same amount of capital/financing to cover the expenses in that year. In addition to the initial investment costs detailed in Tables 1 and 2, there are also other operational support costs and costs for processing waste into processed products. These operational support costs will be allocated to daily operational needs, such as maintenance of machinery and production equipment, electrical installation, labor wages, and others, starting from the first year of SWASPRO implementation, the details of which are presented in Table 3.

Table 3 Fixed cost components of operational support

Nomor	**Komponen Biaya**	**Nilai (Rp)**
1	Building Cost	
	Electrical Installation	30.000.000
	Waste Processing Area Set Up	15.000.000
	Workshop Renovation	30.000.000
2	Working Capital Cost	

	Working Capital	20.000.000
	Maggot Cultivation Cost	30.000.000
3	Other Operating Cost	
	Labor Cost	300.000.000
	Electricity Cost	72.000.000
	Operational Vehicles	90.000.000
	Work Equipment	36.000.000
	Maintenance	18.000.000
	Utility Expense	180.000.000
	Staff Salaries	30.000.000
	Depreciation	11.111.100
	Total	**862.111.100**

Building and Building Costs, Working Capital Costs, and Other Operating Costs and Expenses are grouped as Fixed Costs. These Fixed Costs begin to be incurred from the first year of the program, or referred to as year 1, and are repetitive from year to year as long as SWASPRO runs and becomes a basic need that needs to be paid. The total Fixed Costs required in the implementation of SWASPRO in year 1 is Rp 1.520.219.425. In addition, PT BTS is obligated to share profits with external parties that provide waste collection resources amounting to Rp30,000,000 per month. Furthermore, it is assumed that there will be an increase in Fixed Costs of 2.5% each year. The increase is aligned with the projected annual inflation rate, which generally leads to a gradual increase in the price of goods and services. This cost increase is necessary to maintain the quality and sustainability of the SWASPRO program. Variable Costs in SWASPRO are referred to as Processing Costs, which are further detailed in Table 4.

Table 4 Waste Processing Costs

Type of Waste	Results /Year	Unit	Cost (Rp/ Unit)	Cost.Year(Rp/Year)
POC	180.000	L	15.000	2.700.000.000
Magot feed	1.560	tons	300.000	-

Organic Waste	1.560	tons	-	-
Total				**2.700.000.000**

Variable Costs are equally repetitive to be incurred each year, but the value depends on PT BTS's cumulative results from each year. Similar to Fixed Costs, Variable Costs are also assumed to increase by 2.5% each year. The estimated increase is calculated in anticipation of raw material inflation or other increased needs.

Every business has a revenue target, and to achieve it, companies need to define and estimate three factors, namely production or processing capacity, market demand, and product prices. A competitive product price will attract consumers. However, prices that are too low can reduce profitability, while prices that are too high can reduce demand. The prices of POC, live magot, dead magot, and organic waste have been set by PT BTS and adjusted according to market demand. The price of these products starts from POC at Rp20,000/L, live magot at Rp5,600/kg or Rp5,600,000/ton, dead magot at Rp4,000/kg or Rp4,000,000/ton, and organic waste at Rp300/kg or Rp300,000/ton. If this price is multiplied by the processing capacity of each waste, the revenue earned is shown in Table 5.

Table 5 Revenue from waste processing

Type of Waste	Results. Year	Unit	Price (Rp/ Unit)	Revenue (Rp/Year)
POC	180.000	L	20.000	3.600.000.000
Live Magot	306	Tons	5.600.000	1.713.062.400
Dead Magot	6,1	Tons	4.000.000	24.384.000
Organic Waste	1.560	Tons	100.000	468.000.000
Total				**5.805.446.400**

All prices and values considered as income are assumed to increase by 2.5% per year to align with the expenditure values detailed earlier.

The initial balance owned by the company when starting a business is Rp -783.108.325, and the final balance obtained by the company after running the SWASPRO program for ten years is R 77.734.238.428. The estimated cash flow of the SWASPRO program

over a ten-year period provides valuable insights into the trend of increasing present value during the program's operation. Present value (PV) is defined as the current or present-day value of a sum of money that is to be received or paid in the future. PV is calculated by considering future benefits discounted by a discount factor or discount rate. The results of the PV analysis for the SWASPRO program over ten years of operation are presented in Figure 1.

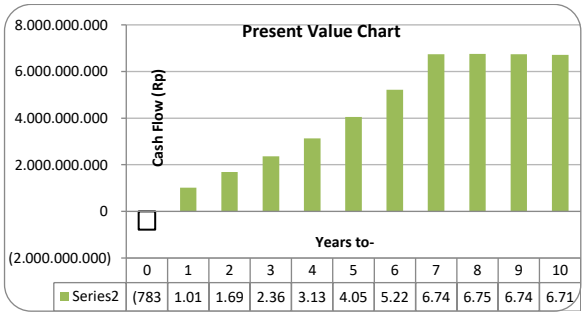

Figure 1. PV trend of SWASPRO for ten years

In year 0, the PV is negative as there is no inflow of funds to the company in that year, but only an outflow, resulting in a negative cash balance. The PV begins to turn positive and increases from year 1 to year 10. This increase is influenced by the number of years of SWASPRO implementation and the discount rate, which reflects the expected rate of return on investment. Based on the feasibility analysis of SWASPRO, all parameters and variables involved in the calculation of feasibility indicators have been identified in detail, starting from the processing results which are assumed to continue to increase as result of the increase in waste volume and product prices, thus reducing market uncertainty. If the level of uncertainty in the market decreases, then the company may use a lower discount rate in evaluating investment projects. As a result, more projects will be considered financially feasible.

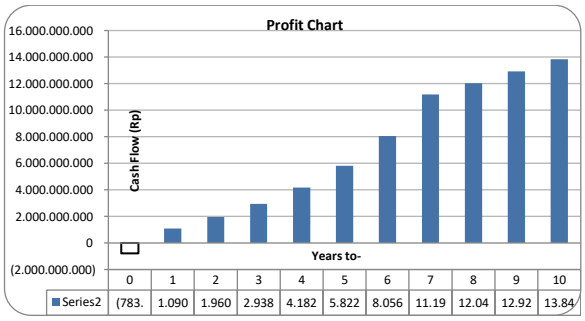

Figure 2. Profit tren of SWASPRO for ten years

The analysis of profit as showed in Fig.2, were calculated by subtracting costs from benefits, indicates a year-on-year increase. Although SWASPRO incurred losses in the initial year of operation (year 0), the profit calculation analysis shows that the first year of operation (year 1) was already able to generate profits from the sale of several types of waste. As previously discussed, this increase may be attributed to several factors, including an increase in regulated product prices and an increase in processing capacity.

Furthermore, the calculation of the financial feasibility of the business for ten years was carried out using the NPV, IRR, Net B/C, and PP indicators. The results of the SWASPRO business feasibility analysis are presented in Table 6.

Table 6 Results of SWASPRO business feasibility analysis

No.	Assessment Indicator	Analysis Result	Ket.
1	NPV	Rp 40.614.826.125	Worth
2	IRR	200,3%	Worth
3	B/C Ratio	2,20	Worth
4	PP	1 year 1 month	Worth
5	Average Profit	Rp 6.661.628.424	

The results of the business feasibility analysis show that the SWASPRO program is feasible. The NPV value obtained is Rp 40.614.826.125, which means that the SWASPRO program will provide a profit of this amount over the ten-year program life according to the current value of money. The IRR percentage obtained was 200,3%, exceeding the prevailing interest rate. Haj MH (2022) states that IRR is the *discount* rate (DR) that results in NPV equal to zero and the amount generated in the calculation is in units of percentage (%). The large percentage *return* is due to the high value of revenue.

4. DISCUSSION

4.1 Verview of Kemang Main Market (TU)

Kemang Main Market (TU) is located at Jalan Raya Sholeh Iskandar RT.02/RW.01, Cibadak, Kec. Tanah Sereal, Bogor City, West Java 16166 with an area of ± 3.2 ha. This market was built by PT Teknik Umum in cooperation with PT Fradanita Sakti in 1996. currently Pasar Induk Kemang (TU) is managed by Bogor City Government. The City Government took over this market from PT Galvindo Ampuh in 2021, because the agreement between the Bogor City Government and PT Galvindo Ampuh had expired in 2007, so that the

management returned to the hands of the Bogor City Government with the takeover process and the mechanism for collecting retribution by the Bogor City Government based on statutory provisions.

The development of Kemang Main Market (TU) has been in accordance with the plan where there are 21 units of shophouses, 100 units of kiosks and 1508 units of los/lapak. Traders in Kemang Market (TU) mostly consist of vegetable and fruit traders, making it the largest producer of organic waste. This market operates from 13.00 WIB until the morning with crowds at 16.00 WIB - 23.00 WIB.

Regarding the processing of waste obtained from the object of research, the stages passed start from the organic waste slurry from the Gibrik Machine will be processed again with a Screw Conveyor Machine to separate the water content from the organic slurry. The water separated from the organic slurry (called leachate water) will be carried out a fermentation process with a certain time which will produce Liquid Organic Fertilizer (POC) products. The organic slurry that has minimal water content will be processed again using Maggot BSF which will reduce the odor and produce Fresh Maggot BSF products, Liquid Organic Fertilizer and Solid Organic Fertilizer. Organic slurry that has minimal water content will be processed again using a Carbonizer Machine which will turn it into activated carbon. Activated carbon products will be treated by including microorganisms so that the activated carbon becomes a Super Activated Carbon product.

4.2 SWASPRO Financial Feasibility Analysis

According to Haj MH (2022), feasibility analysis is a mathematical analysis method used to determine the status or feasibility criteria of a business unit based on the value of the results of the analysis indicators. Feasibility analysis plays a role in determining the profitability of a business and as a means of predicting the production scheme of a business unit over the next few periods.

In a business, project or investment, costs are grouped based on their respective allocations so that they can be monitored, evaluated, and used as decision-making material. In the SWASPRO business feasibility analysis, the costs stated are costs that directly affect waste processing operations, including costs related to land and/or buildings, marketing costs, processing costs, transportation costs, and other costs that can be quantified.

According to Nugraha A P (2019), the amount of waste generation in an area can increase, which begins with the increase in population in an area, thus requiring effective management. The amount of waste from Kemang Market (TU) in Bogor City is estimated to increase by 50% every year. Thus, the allocation for processed magot feed and organic waste, is estimated to have a constant increase of 50% more than the previous year's amount, while

the allocation for POC products, will increase by an absolute constant of 2,000 L each month per year. The processing process incurs costs identified as Variable Costs, which according to Asti (2016) are costs that are determined by the number of units of product produced, and are generally expressed in units of product volume or activities such as tons or hours.

Pahrijal (2023) states that waste management (recycling) is a cost-effective activity, if costs and prices are properly calculated. In addition, waste management also has opportunities in the form of increased consumer awareness of *sustainable* and recycled products. Thus, waste management is indeed a business that can provide high returns if managed properly. The B/C ratio value obtained is 2,20, which means that every Rp1 spent will provide a profit of Rp2,20. In addition, the calculation of PP also provides information on the time required to return the business capital is only about 1 year and 1 month, with an average profit from ten years of operation of Rp 6.661.628.424. Referring to Haj MH (2022), based on the business feasibility criteria obtained, the SWASPRO program is considered feasible, indicated by the NPV value greater than zero, positive IRR value, positive Net B/C value, and short payback duration. However, it should be noted that the entire analysis is based on the viability of the business. Therefore, to realize the calculated feasibility, the management needs to monitor the waste processing activities from upstream to downstream in order to comply with the applicable procedures.

5. CONCLUSİON

The results of the feasibility study indicate that the SWASPRO program is viable for implementation. With a net present value (NPV) of Rp 40,614,826,125, the SWASPRO program is projected to generate a profit of that much throughout its ten-year lifespan based on the present monetary worth. An internal rate of return (IRR) of 200.3% and a book-to-cash (B/C) ratio of 2.20 indicate that every Rp1 spent will yield a profit of Rp2.20. Furthermore, the computation of the PP also yields data on the time required to recoup the business capital, which is approximately 1 year and 1 month. The average profit derived from ten years of operation is Rp 6,661,628,424. Therefore, the SWASPRO program is deemed viable for implementation, as evidenced by the attainment of a positive NPV value, a positive IRR value, a positive Net B/C value, and a short return on investment duration. An examination of the relationship between variables using Multiaspect Sustainability Analysis (MSA) reveals the elements that impact the sustainability of organic waste processing enterprises in Kemang Main Market (TU) in Bogor City. The economic side comprises three factors: price stability issues, government aid, and investment expenses. The social dimensions consist of two components: formal education and market management engagement. One primary determinant of the environmental element is the utilization of

renewable energy. The Multiaspect Sustainability Analysis (MSA) of organic waste processing enterprises in Kemang Main Market (TU) in Bogor City indicates that the businesses are sustainable. The economic aspect score is 78.13%, the social aspect is 84.38%, and the environmental aspect is 75%. A result of 79.17% places the analysis conducted by multiaspect organic waste processing enterprises in the very sustainable category. All analysis is grounded on the concept of business continuity. Hence, in order to achieve the calculated feasibility, management must oversee waste processing operations from the beginning to the end in order to adhere to relevant criteria.

From a more comprehensive perspective, the increase in profit in the organic waste management program is the result of various strategic initiatives. Firstly, the use of the latest technology in processing machines, such as crushers and screw conveyors, has improved the processing process. Secondly, market expansion, marked by a high demand for organic products such as POC or maggots, has also contributed to the profitability of the SWASPRO program. Thirdly, in terms of the organic products offered, these products are widely used by the public. Liquid organic fertilizer (POC) is essential in both small-scale and large-scale agriculture, maggots have various functions that make them highly beneficial, especially in livestock, agriculture, and organic waste management, and organic waste itself is widely used by people who understand the circular economy. These factors have been the driving force behind the increased profitability of the SWASPRO program. Therefore, the organic waste management program not only contributes positively to the environment but also serves as a sustainable source of income for the company.

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