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BUSINESS FEASIBILITY ANALYSIS OF UPJA CAHAYA BINTANG (AGRICULTURAL MACHINERY SERVICE UNIT) IN MUARA ENIM, SOUTH SUMATERA

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Abstract

The Agricultural Equipment and Machinery Service (AEMS) Business or Usaha Pelayanan Jasa Alat dan Mesin Pertanian (UPJA) plays a crucial role in improving farming efficiency through mechanization, especially for farmers without access to agricultural machinery. This study analyzes the feasibility of Cahaya Bintang in Muara Enim Regency from financial, technical, and economic perspectives through a descriptive quantitative approach. The results indicate that with total operational costs of IDR 741,933,333 and total revenue of IDR 768,000,000, the business generates a profit of IDR 26,066,666 and an R/C Ratio of 1.04, which indicates financial feasibility. However, the low profit margin highlights the need for operational efficiency improvements, such as optimizing machinery utilization, reducing fuel costs, and diversifying services. Other recommended strategies include strengthening cooperation with farmer groups, enhancing machinery maintenance, and institutional support to improve competitiveness and business sustainability.

Keywords*: UPJA; Business Feasibility; Agricultural Mechanization; Operational Efficiency.*

INTRODUCTION

The agricultural sector is one of the main sectors in the Indonesian economy that plays an important role in providing food, creating jobs, and improving the welfare of the community, especially in the countryside. The development of agricultural technology, including the use of agricultural tools and machinery, has positively impacted agricultural efficiency and productivity. However, not all farmers have access or the ability to own independently, so the establishment of the UPJA is a solution for them (Royan et al., 2021).

UPJA has an important and strategic role in supporting the fulfillment of agricultural production. The use of agricultural equipment and machinery can accelerate and improve soil management and quality, facilitate the process of water supply, and increase the productivity of agricultural products. UPJA is an economic institution engaged in services to optimize the use of agricultural equipment and machinery within farmer groups and outside farmer groups. The purpose of the establishment UPJA is to increase the production of agricultural products, improve the economy of farmers, create jobs for the younger generation, accelerate land cultivation, and introduce agricultural mechanization to farmers (Arizka et al., 2021).

According to the guidlines of agricultural equipment and machinery service businesses (Direktorat Alat dan Mesin Pertanian, 2014), the main function of UPJA institutions is to carry out economic activities in the form of services for agricultural equipment and machinery in handling cultivation such as land preparation and tillage services, irrigation water supply, planting, maintenance, plant protection, harvesting, threshing, drying and rice milling services including encouraging product development to increase added value and expand market acces, and improving farmers' welfare. Muara Enim Regency has good agricultural potential. The existence of UPJA can certainly help the sustainability of agricultural activities in this district. UPJA Cahaya Bintang, operating in Muara Enim Regency, is one of the businesses engaged in the service of agricultural tools and machinery. UPJA supports farmers in the process of

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agricultural cultivation through the rental and use of agricultural tools and machinery effectively and efficiently. In its operations, UPJA Cahaya Bintang faces various challenges, such as operational costs, equipment maintenance, and fluctuating levels of service demand. Studies show that the sustainability of UPJA is strongly influenced by technical and managerial factors, including the availability of irrigation networks, cropping patterns, service quality, partnerships between UPJA and farmer groups, and the managerial ability of UPJA (Wardani & Erniati, 2019).

In Lampung, the development of agricultural machinery, including rice plantation supported by the government through the Agricultural Machinery Brigade (Brigade Alsintan). The Alsintan Brigade is an institution under the Lampung Provincial Agriculture Office responsible for providing services related to agricultural machinery, especially for land preparation for rice, corn, and soybean cultivation. These services are delivered through the rental of the necessary agricultural machinery and equipment. One of the machinery rental services offered by the Alsintan Brigade of Lampung Province is the rice plantation. This rental service is distributed through UPJA, which are managed by farmer group associations. In the agricultural machinery rental business, effective management must be accompanied by a techno-economic analysis to ensure that decisions made are not only technically but also financially viable (Asmara et al., 2024). Therefore, a feasibility analysis is important to assess whether UPJA is viable for further development of financial, technical, and economic aspects (Royan et al., 2021).

This study aims to analyze the business feasibility of UPJA Cahaya Bintang in Muara Enim, South Sumatra, to provide a clear understanding of its business prospects and to identify strategies that can be applied to improve the performance and sustainability of the enterprise. Research by Wardani & Erniati, (2019) stated that feasibility analysis is useful to support the development of UPJA. The results of this analysis can provide valuable recommendations for UPJA business managers, the government, and other related parties in supporting the development of agricultural tools and machinery services in the area.

RESEARCH METHODS

Research Type and Design

This research uses a descriptive quantitative method to analyze the feasibility of the UPJA Cahaya Bintang in Muara Enim, South Sumatra to calculate the financial aspects of UPJA, such as operating costs, income, profits, and R/C Ratio values. This approach has been used in various previous studies, such as research by Royan et al., (2021), which evaluates the financial feasibility of UPJA in Brebes Regency.

Location and Time of Research

This research was conducted at UPJA Cahaya Bintang, Muara Enim Regency, South Sumatra, which operates in the field of providing agricultural tools and machinery services. The selection of this location was carried out purposively (intentionally) based on the presence of UPJA, which can provide empirical data relevant to business feasibility analysis. Data collection was conducted in 2024, based on operational cost data and revenue obtained from the UPJA business manager.

Data and Data Sources

This research uses two types of data:

1. Primary Data: Data obtained directly from UPJA Cahaya Bintang through observations and interviews with managers focusing on operational costs, business income, and challenges in managing agricultural tools and machinery services.
2. Secondary Data: Data obtained from journals, research reports, and government publications related to agricultural mechanization and UPJA management, such as research by Karimah

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et al., (2020) on agricultural mechanization and Mayrowani & Pranadji, (2012) on UPJA institutional development patterns.

Data Collection Technique

Data collection techniques were conducted through the following methods:

1. Observation: Directly observe the operational activities of UPJA Cahaya Bintang to find out the use of agricultural tools and machinery and the obstacles faced.
2. Interview: Conducted with UPJA business managers to obtain information on operational costs, income, and business strategies implemented.
3. Documentation: Collecting secondary data from academic journals and official reports concerning UPJA business management and agricultural mechanization.

Data Analysis Technique

Data analysis was conducted using the business feasibility analysis method, which includes:

1. Calculation of Operating Costs: Analyzing fixed costs and variable costs based on data collected from UPJA. The alignment with the research of Royan et al., (2021), which emphasizes the importance of efficiency in managing fixed and variable costs to increase UPJA profitability.
2. Revenue and Profit Analysis: Calculating the total revenue and profit of the UPJA to evaluate its financial viability.
3. Calculation of R/C Ratio: The feasibility of the UPJA business is determined using the following formula:

   R/C Ratio= Total Revenue / Total Cost

   If the R/C Ratio value is greater than 1, the business is considered financially viable (Yulia, 2021).
4. Comparison with Previous Studies: The results of the analysis were compared with other studies, such as research by Wardani & Erniati (2019), which analyzes the factors influencing UPJA performance with the Structural Equation Modeling (SEM) approach.

RESULTS AND DISCUSSION

The Financial feasibility analysis of UPJA Cahaya Bintang showed that, total operating costs amounted to IDR 741,933,333 with total revenue of IDR 768,000,000. This resulted in a profit of IDR 26,066,666 and an R/C Ratio of 1.04 (Table 1). The R/C Ratio value greater than 1 indicates that the business is financially feasible, as the income earned exceeds the total operating costs.These results align with the research of Royan et al., (2021), which found that UPJA with effective financial management can achieve financial feasibility with an R/C Ratio above 1.15. This research is also aligned with the research of Ulfa (2021), several business units were declared financially feasible based on the analysis of Net Present Value (NPV), Internal Rate of Return (IRR), and Benefit-Cost Ratio (B/C Ratio). The rice plantation agricultural machinery service unit is feasible to be operated and should be encouraged, especially for planting areas larger than 30 hectares, as this will further increase profitability.

According to Research from Darma et al., (2024), the need for manual tractors in Bangbang village is 15 units, with a manual tractor work efficiency of 55.45% for land cultivation. Factors influencing the processing time of paddy fields using manual tractors equipped with plows include variations in plot size and the skill level of the tractor operator. Bangbang village, with an agricultural area of 132 hectares and a plowing duration of 30 days, requires 15 manual tractors. However, attention must be given to the management and allocation of manual tractors according to the needs of each sub-area's agricultural land. Another study by Legizasvera (2020) on combine harvester rental services in Kampar Regency showed that the

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business was not financially viable, with an R/C Ratio of 0.85 and a negative NPV. Compared to these results, UPJA Cahaya Bintang showed better performance in terms of financial viability.

Table 1. Financial Feasibility Analysis Results UPJA Cahaya Bintang

No.	Calculation Component	Value (Rp)
1.	Operational Costs	
	a. Fixed Cost (FC)	206,733,333
	b. Variable Cost (VC)	535,200,000
	Total Cost (TC)	741,933,333
2.	Total Revenue (TR)	768,000,000
3.	Profit (π)	26,066,667
4.	R/C Ratio	1.04

Source: Processed data (2024)

An analysis of the cost structure shows that the largest fixed costs come from the cost of maintenance agricultural tools and machinery and reserve costs, each amounting to IDR 76,800,000 (Table 2). Maintenance as a fixed cost reflects the essential need to ensure the operational continuity of the equipment and this cost must still be allocated regardless of whether the equipment is used at full capacity or not, thus having a significant impact on the total fixed costs of UPJA. Failure to manage this maintenance cost can result in greater losses, such as equipment downtime, decreased productivity, and more expensive major repairs. This indicate that equipment maintenance constitutes a significant portion of the fixed cost structure, a finding that is also supported by Wardani & Erniati, (2019), their research found that poorly managed agricultural tools and machinery maintenance can increase fixed costs and reduce UPJA business efficiency. The largest variable cost is the cost of fuel for agricultural tools and machinery, amounting to IDR 314,400,000, covering more than 50% of total variable costs (Table 3).

Table 2. Details of Fixed Costs UPJA Cahaya Bintang

No.	Fixed Cost	Cost (Rp)
1.	Depreciation Value	34,333,333.33
2.	Agricultural tools and machinery Maintenance Cost	76,800,000.00
3.	Grantee Profit Sharing	18,800,000.00
4.	Other fixed costs (reserve)	76,800,000.00
5.	**Fixed Total Cost**	**206,733,333.33**

Source: Processed data (2024)

Table 3. Variable Cost Details UPJA Cahaya Bintang

Variable Cost	Combain Rental	Combain Services	Tractor Services	Vertical Dryer	Total
Fuel Cost of Agricultural tools and machinery	-	200,000,000	100,000,000	14,400,000	314,400,000
Operator Costs	24,000,000	4,800,000	57,600,000	6,000,000	92,400,000
Service Fee	6,000,000	50,400,000	14,400,000	6,000,000	76,800,000
Helper Wages	-	9,600,000	-	-	9,600,000
Supervisor Wages	-	2,400,000	-	6,000,000	8,400,000
Employee Salary	6,000,000	7,200,000	14,400,000	6,000,000	33,600,000
				Variable Total Cost	**535,200,000**

Source: Processed data (2024)

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UPJA Cahaya Bintang has been proven to be financially viable, its small profit margin suggests that there are opportunities for improvement in both the cost and revenue structure. Several strategies can be implemented to improve business efficiency, including optimizing the utilization of agricultural tools and machinery by extending the working hours of the equipment to serve more farmers in one planting cycle. In addition, enhancing service quality through collaboration with farmer groups and other agricultural service providers can help build customer trust and loyalty.

Research by Mayrowani & Pranadji, (2012) highlights that the development of UPJA in Indonesia still faces various challenges, especially in the institutional aspect. They identified that UPJA institutions have not been specifically directed to produce agricultural products with high value and competitiveness. Additionally, UPJA is also often hindered by limited access to capital networks, insufficient managerial skills, and inadequate rural facilities and infrastructure. Routine equipment maintenance also requires attention to minimize the risk of severe damage that may need expensive repairs. Diversification of services, such as post-harvest equipment rental or harvest storage services, can also serve as an alternative to increase UPJA's source of income.

CONCLUSIONS AND SUGGESTIONS

UPJA Cahaya Bintang is considered financially feasible with an R/C Ratio of 1.04. However, the relatively small profit margin suggests the need for improved strategies in managing both costs and revenues. Compared to previous studies, these results show a fairly good performance, but still have the potential for further improvement. As a corrective measure, UPJA Cahaya Bintang is advised to enhance operational efficiency by improving fuel management, such as adopting energy-efficient technology or optimizing the scheduling system. In addition, diversifying services by adding post-harvest equipment rental services or agricultural consulting services can open up new revenue opportunities. Increased cooperation with farmer groups as well as government support in the form of technical training and equipment assistance, can also help improve the competitiveness of UPJA in the future.

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