



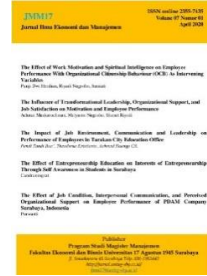
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## Analysis Of Investment Feasibility To Additional Mushroom Cultivation Hotties In Kayu Embun MSMES In Main Sumatra

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### ABSTRACT

Small and Medium Enterprise (SME) Kayu Embun located in North Sumatra Province is a business that focuses on agriculture of mushroom cultivation. Since starting the business, they have always been busy handling sales because the product's quality is known to be good, so high demand often occurs occasionally. Therefore, this SME plans to build a new cultivation hut to fulfill increasing customer demand. The purpose of this research is to determine the feasibility of investing in additional oyster mushroom huts in the SME Kayu Embun using the Net Present Value (NPV), Internal Rate of Return (IRR), and Payback Period (PP) methods. In NPV calculations, a value of IDR79,991,344 is obtained, where the acquisition value is more than 0. Calculations using the IRR method obtain a value of 292%, which is greater when compared to the value of the interest rate of 5.57% while using the PP method, we obtain a result of 0.35 years or 4.21 months which is < 4 years (the operational life of the mushroom hut) hence it can be concluded that the investment in adding oyster mushroom huts is feasible.

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### 1. Introduction

UMKM Kayu Embun is a business that focuses on the agricultural sector of mushroom cultivation located in North Sumatra Province. Since starting his business, this mushroom cultivation has always been busy with buyers because of the high quality of the product. Oyster mushrooms are cultivated in a building called a mushroom hut. There are 2 mushroom huts currently owned by UMKM Kayu Embun with a capacity of 2000 baglogs (mushroom seeds) per hut. From these two mushroom huts, the average daily income is 11 kg of oyster mushrooms. Based on the results of interviews with the owners of oyster mushroom MSMEs, demand for mushrooms in this area is very high. This is caused by a number of things, apart from the high daily demand in traditional markets, oyster mushrooms are also a food ingredient that must be available during certain events, such as funerals in the North Sumatra area. This mushroom ordering system is ordered 3 days or the day before the order will be taken by the consumer. The following is data on demand and mushroom harvest (income) for MSMEs per day in August 2022:

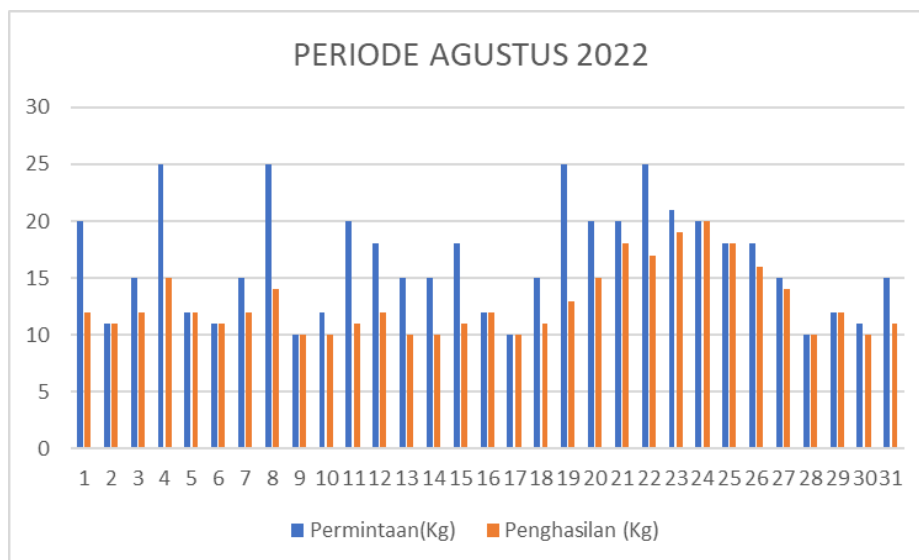


Figure 1. Demand and Income Data for August Period 2022

The graph above is data on demand and income for mushrooms from the two cottages currently owned by oyster mushroom MSMEs. From this graph it can be seen that all consumer demands cannot be met because the mushroom production produced is insufficient. Usually demand can reach 20-30 kg per day, so these MSMEs cannot fulfill all requests due to limited cottages. On the other hand, it is not possible to add baglogs of mushrooms which will cause storage to pile up. Storing oyster mushroom baglog stacked in stacks on a stacking rack without partitions can cause the baglog at the bottom of the stack to be susceptible to rot, this occurs due to the presence of water deposits due to spraying which cannot be absorbed properly [1]. The humidity factor in the room is also one of the reasons why the accumulation of baglog oyster mushrooms cannot be done too much, because it can trigger difficulties in maintaining room temperature which can trigger the potential for crop failure. Room humidity that is too high can also trigger the growth of contaminants which can ultimately damage the growing medium for oyster mushrooms.

In the end, mushroom cultivation MSMEs need to add more cottages so that more mushrooms are produced and all demands can be met. Therefore, these MSMEs need to determine the capital to be invested and the estimated return on capital after the investment is made by carrying out a feasibility test for adding mushroom huts. Will the addition of this mushroom hut provide benefits for these MSMEs or will it provide losses?

The problems that occur regarding the feasibility test for investment have similarities with research conducted by Eka Setiajtnika and Trida Gunadi where in this research a feasibility test was carried out by considering the financial aspects, this involved several indicators, namely Cash Flow, NPV, PP, and Provitability Index (PI). Apart from that, there is also research conducted by I Wayan Parwata which discusses the feasibility test of housing development investment to be carried out in the Tababan area of Bali which will then be reviewed from the financial aspect. This research will involve several research methods, namely the NPV, IRR, PI and PP methods. In research conducted by Rounaz Perdana Ariawarman which discusses the feasibility analysis of investment in the construction of a multi-purpose building in the city of Lamongan using the NPV and IRR methods. In research conducted by Syamsul Huda and Robi Andoyo regarding cultivation feasibility tests which will be carried out using the NPV, IRR, PP and PI methods. Meanwhile, research conducted by Karebet Gunawan regarding the feasibility of investment which will be viewed from a financial aspect uses several methods, namely, the NPV, IRR and PP methods.

Based on the literature review that has been carried out, we decided to conduct a feasibility test for investing in the addition of Mushroom Cottages in MSMEs Cultivating Kayu Embun Oyster

Mushrooms, which will be reviewed using the Net Present Value (NPV), Internal Rate of Return (IRR) and Payback Period methods. (PP).

## 2. Method

The Net Present Value (NPV) method is a method that calculates the difference between revenues and expenditures. Net Present Value (NPV) is also often used in capital budgeting by analyzing the profits from a business and investment plan. In the calculation process using NPV, if a positive NPV value is obtained ( $NPV > 0$ ), then it means that the income received is greater than the initial investment value, whereas if the NPV value is negative ( $NPV < 0$ ), then this indicates that the income is smaller rather than expenses, this shows that the business being carried out is experiencing a loss. The formula used to calculate Net Present Value (NPV) is as follows [2].

$$NPV = \sum_{t=1}^n \frac{Cf_t}{(1 + i)^t} - I$$

Information:

$Cf_t$  = Annual net cash flow in period t

I = Investment Value (Initial cash flow)

i = Past interest rate (COC)

n = Age of investment

The criteria for assessing investment feasibility using the NPV method are: if the NPV value is negative then the investment experiences a loss, if the NPV is zero then it means the investment only experiences a return on capital, and if the NPV is positive then the investment is worth making.

The Internal Rate of Return (IRR) method is a method used to calculate the interest rate which will represent the net present value. The Internal Rate of Return (IRR) method is a method used by companies to carry out analysis regarding the feasibility of investment plans. This method is also known as the method that displays the economic rate of return. If the IRR value is smaller than the Cost of Capital (CoC) value, then the investment is not feasible. The use of the IRR method also functions to conduct research related to calculating profits and losses that may occur in the company [3]. The advantage of using this method is that it does not take into account the time value of money. The following is the formula for IRR calculation:

$$I = \sum_{t=1}^n \frac{Cf_t}{(1 + IRR)^t}$$

$$IRR = P_1 - C_1 \left( \frac{P_2 - P_1}{C_2 - C_1} \right)$$

Information:

$P_1$  = First interest rate

$P_2$  = Second interest rate

$C_1$  = 1st NPV

$C_2$  = 2nd NPV

The criteria for assessing investment feasibility is if the IRR value obtained is greater than the ROR value [2].

The Payback Period (PP) method is a method used to calculate the period required to return investment capital. If the time needed to return capital is shorter, the investment is more feasible. [4]. The advantage of using the Payback Period (PP) method is that the method of use and calculation is relatively easier when compared to several other methods. The following is the formula for the calculation:

$$PP = n + \frac{a - b}{c - b} \times 1 \text{ tahun}$$

Information:

N=Last year in which the amount of cash was not able to cover the initial investment costs

a= Initial investment amount

b = Cumulative amount of cash flow in the nth year

c = cumulative amount of cash flows in year n+1

The assessment criteria is that if the payback period is shorter than the maximum payback period, then the investment plan is acceptable [5].

### 3. Results and Discussion

#### Investment Costs

Based on the data obtained, to build 1 mushroom hut made of bamboo with a capacity of 4000 baglogs it costs IDR 10,000,000.

#### Operational Costs

Table 1. Oyster Mushroom MSME Operational Costs

Description	Amount	Unit	Unit Price
Mushroom Seeds	4000	baglog	Rp3.000
Packaging Plastics	10	kg	Rp50.000
Maintenance and Electricity		months	Rp200.000

Table 2. Oyster Mushroom MSME Operational Costs

Deskripsi	Biaya per 6 bulan	Biaya per tahun
Mushroom Seeds	Rp12.000.000	Rp24.000.000
Packaging Plastics	Rp500.000	Rp1.000.000
Maintenance and Electricity	Rp1200.000	Rp2.400.000
Depreciation		Rp1.428.571
<b>Total</b>	<b>Rp13.700.000</b>	<b>Rp27.400.000</b>

The operational costs above are the costs that will be paid for cultivating mushrooms in a cottage with a capacity of 4000 baglogs. The grouping of costs per 6 months for mushroom seeds and plastic packaging is due to the fact that the baglog's lifespan is only 6 months, so the baglog is replaced every 6 months. Depreciation costs are the depreciation costs of the cottage building which are obtained by calculating using the straight line depreciation method, namely by dividing the investment cost of IDR 10,000,000 by the economic life of the mushroom cottage, which is 7 years.

#### Income

The income of oyster mushroom MSMEs is the result of calculating mushroom sales in cottages with a capacity of 4000 baglogs. This income is important to calculate to determine the cash flow of oyster mushroom MSMEs. Based on data, per baglog produces an average of 0.42 kg of mushrooms and not all baglogs are successful in growing mushrooms. The mushroom planting period is a month with the next 5 months being the harvest period. The total income in the second, third and fourth years is also calculated the same way with different harvests in each year. Kayu Embun UMKM has been operating for 4 years, here is the total income earned in the first year as presented in Table 3.

#### Net Present Value Calculation

In calculating Net Present Value (NPV), you must first find the cash flow obtained by subtracting income from expenses (total operational costs). The Discount Factor (DF) values take into account the interest rate (i) of 5.57% and the inflation percentage of 6%. The Present Value (PV) value is obtained by multiplying cash flow by DF which is then totaled to obtain the NPV value as in the Table 4.

Table 3. First year income

<b>Deskripsi</b>	<b>Jumlah</b>	<b>Satuan</b>
Yield per baglog	0,42	kg
Mushrooms grow for the first 5 months	3832	baglog
Mushrooms grew in the second 5 months	3845	baglog
Harvest results for the first 5 months	1609,44	kg
Harvest results for the second 5 months	1614,9	kg
Total harvest per year	3224,34	kg
Selling price of oyster mushrooms	Rp18.000	per kg
<b>Total income for 1st year</b>	<b>Rp58.038.120</b>	

Table 4. NPV calculation

<b>Tahun</b>	<b>Cashflow</b>	<b>DF</b>	<b>PV</b>
0	-Rp10.000.000	1,0000	-Rp10.000.000
1	Rp29.209.549	0,8949	Rp26.138.298
2	Rp29.595.109	0,8008	Rp23.698.719
3	Rp29.844.589	0,7166	Rp21.385.677
4	Rp29.270.029	0,6412	Rp18.768.649
	<b>NPV</b>		<b>Rp79.991.344</b>

An investment is declared feasible if the NPV value is  $> 0$ . Based on the calculation results above, the NPV obtained is IDR 79,991,344 so the addition of this mushroom hut is feasible.

#### Internal Rate of Return Calculation

The calculation of the Internal Rate of Return (IRR) is an indicative value that describes how much interest the investment can provide when compared with generally accepted bank interest rates (market interest rates). The interest rate in this research refers to the current Indonesian bank interest rate in 2023, which is 5.57%. The following is the IRR calculation:

Table 5. IRR Calculation

<b>Tahun</b>	<b>Cashflow</b>
0	-Rp 10.000.000
1	Rp29.209.549
2	Rp29.595.109
3	Rp29.844.589
4	Rp29.270.029
<b>IRR</b>	<b>292%</b>

Based on the results of calculations using the formula in Ms.Excel, an IRR value of 292% was obtained. This value is very large and irrational, which is one of the weaknesses of the IRR calculation so that in some cases it is likely that the calculation results will be negative or more than 100%. Apart from that, the income earned each year is too high compared to the expenses in that year so that in less than a year the return on investment has been achieved (the income has exceeded the costs invested). An investment is declared feasible if the IRR value is  $> i$ . Obtaining an IRR value of 292% shows that this value is greater than the interest rate ( $i$ ) of 5.57%, so it can be concluded that the investment in adding this mushroom hut is worth doing.

#### Payback Period Calculation

The Payback Period (PP) method is used to test the feasibility of an investment based on the time required to return the initial investment value for the investment. Investment is declared feasible if the

PP value < operational age. This method does not use interest formula calculations, but what is analyzed is how quickly the capital or investment that has been spent can be returned. The assessment criteria is that the shorter the return on investment, the better. The following is the PP calculation:

This section involves describing the results obtained from the research and drawing similarities and differences between the research and previous others from methods, data, and results. However, describe whether the problems have been researched successfully according to the objectives using the proposed methods. This should involve the description of the analysis conducted, cause and benchmark of success/failure, and the unfinished part of the research followed with the steps to be taken as follow up process.

Table 6. Payback Period Calculation

Tahun	Cash Flow	Cum. Cash Flows
0	-Rp10.000.000	-Rp10.000.000
1	Rp29.209.549	Rp19.209.549
2	Rp29.595.109	Rp48.804.657
3	Rp29.844.589	Rp78.649.246
4	Rp29.270.029	Rp107.919.274
<b>Payback Period (PP)</b>		<b>0.35</b>

Based on the table above, the payback period value is 0.35 years or 4.21 months. This shows that in the 4th month the business run by Oyster Mushroom MSMEs began to make a profit or the invested capital was returned (capital return). The PP value of 0.35 years is smaller than the operational life of the mushroom hut, which is 4 years. So, this investment is worth making.

#### 4. Conclusions

Based on data analysis and processing to test the feasibility of investing in additional mushroom huts in the Kayu Dew Oyster Mushroom Cultivation MSME, using the Net Present Value (NPV), Internal Rate of Return (IRR) and Payback Period (PP) methods, it is known that the investment is feasible to make. So, the investment in adding one mushroom cultivation cottage at Kayu Embun UMKM is feasible.

The results of the analysis of adding mushroom huts to the Kayu Dew Oyster Mushroom MSME using the method used are still incomplete due to the limited data obtained. In future research, it would be better if more detailed data were collected and other appropriate investment feasibility analysis methods could be tried for maximum results.

#### 5. References

- [1] I. & R. U. Winarni, "Pengaruh Formulasi Media Tanam dengan Bahan Dasar Serbuk Gergaji terhadap Produksi Jamur Tiram Putih (*Pleurotus Ostreatus*)," *Jurnal Matematika, Sains dan Teknologi*, vol. 3(2), pp. 20-27, 2002.
- [2] L. L, "Analisis Kelayakan Investasi Bisnis Jasa Pengiriman Barang Ditinjau dari Aspek keuangan (Studi Kasus pada CV Wahana)," *Jurnal Ekonomi*, vol. 17(3), pp. 421-433, 2015.
- [3] Sullivan, G. William., Wicks, Elin M., Koelling, C. Patrick., "Engineering Economy," Pearson Education Inc. New Jersey, USA., 2015.
- [4] Rachadian, F, R., Agassi, E, A., Wahyudi, S., "Analisis Kelayakan Investasi Penambahan Mesin Frais Baru Pada CV XYZ," *Jurnal Teknik Industri*, vol. 8(1), 2013.
- [5] A. B. Saniyah, "Analisis Kelayakan Investasi Pembelian Mesin Cetak Offset pada Percetakan N3 Grafika," Universitas Islam Majapahit, Mojokerto, 2019.
- [6] Hary., "Akuntansi Dasar 1 dan 2," Jakarta Grasindo, 2014.

- [7] J. X. L. Yasuha and M. Saifi, "Analisis Kelayakan Investasi Atas Rencana Penambahan Aktiva Tetap (Studi Kasus pada PT Pelabuhan Indonesia III (Persero) Cabang Tanjung Perak Terminal Nilam," *Jurnal Administrasi Bisnis S1 Universitas Brawijaya*, pp. 113-121, 2017.
- [8] J. Kasmir, *Studi Kelayakan Bisnis*, Jakarta: Prenadamedia Group, 2016.
- [9] OECD, "oecd.org," 31 Desember 2022. [Online]. Available: <https://www.oecd.org/ctp/glossaryoftaxterms.htm>.
- [10] N. K. Armaeni, I. W. Widanan and D. A. N. Sriastuti, "Analisis Risiko Pemodelan Cash Flow Proyek Investasi Real Estate di Kabupaten Badung dengan Program @Risk," *PADURAKSA*, pp. 46-62, 2017.
- [11] T. A. Wilujeng, S. Riyadi and M. S. Ridwan, "Analisis SWOT dan Aspek Keuangan Studi Kelayakan Investasi Pengembangan Rumah Sakit Umum Wonolangan Probolinggo," *Jurnal Ekonomi dan Bisnis*, p. 4, 2019.
- [12] Badan Pusat Statistik, "bps.go.id," 30 Desember 2022. [Online]. Available: <https://www.bps.go.id/pressrelease/2023/01/02/1949/inflasi-year-on-year--y-on-y--pada-desember-2022-sebesar-5-51-persen--inflasi-tertinggi-terjadi-di-kotabaru-sebesar-8-65-persen-.html#:~:text=Beranda%20%C2%BB%20Berita%20Resmi%20Statistik%20%C2%BB%20Infla>.
- [13] S. Sutojo, "Menyusun Strategi Harga," Damar Mulia Pustaka, 2001.
- [14] A. Subagyo, *Studi Kelayakan: Teori dan Aplikasi*, Jakarta: Elex Media Komputindo, 2007.
- [15] N. E. Sakinah, I. N. D. P. Putra and A. Rumintang, "Analisis Kelayakan Ekonomi pada Pembangunan Perkantoran Tower Poros Maritim Surabaya," *PADURAKSA*, pp. 224-231, 2021.
- [16] I. W. Parwata, "Kelayakan Investasi Pembangunan Perumahan di Tabanan Bali," *EXTRAPOLASI*, vol. 8, pp. 105-120, 2015.