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Strategy Development of Red Ginger-Cinnamon Coffee of Tanah Wulan Village, Indonesia

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Abstract

Coffee is one of the Indonesia's leading plantation commodities. No<mark>wadays there is much interest t</mark>o <mark>use the m</mark>ixture of spices and herbs to add the characteristics of the taste and effects or efficacy of the brewed coffee. Spice coffee is a roasted coffee product that is added to a mixture of <mark>spices an</mark>d brewed using hot water. One of the producer of spices coffee in Bondowoso district, Indonesia is a woman farmer group of Tanahwulan village. The product is manufactured by using various mixture of spices such as red ginger and cinnamon. This study aims to assess the financial feasibility of the red ginger and cinnamon coffee business and its development strategy so that these products are highly competitive as a quality Indonesian agro-industrial product. This research was a quantitative descriptive study using primary and secondary data. Primary data obtained by observations and questionnaires. Meanwhile, secondary data were obtained from various literatures. The data analysis methods used were financial feasibility analysis and SWOT analysis. The business financial analysis results explained that the business of Red Ginger-Cinnamon Coffee of Tanah wulan village was feasible to be executed. Based on the sensitivity analysis, the business could still exist if the second scenario applied with scenario of 5% increase in raw materials and 3% decrease in selling prices. Based on SWOT Analysis, the business is in the most profitable situation. Therefore, it is necessary to apply the aggressive strategy by taking advantage of existing opportunities and internal strengths of the organization.

Introduction

Coffee is one of the Indonesia's leading plantation commodities (Abdul, 2016; Arifin, 2013; Fitriani et al., 2021; Hodijah & Delis, 2018). Indonesia ranks fourth among the world's major coffee exporters where Indonesian Robusta coffee has become the most produced commodity compared to Arabica coffee (Rosiana et al., 2018). Coffee by the people of Indonesia is enjoyed by roasting, grinding and then brewing. There are several habits of Indonesian people who add granulated sugar, palm sugar or various flavors and additives to coffee (Gumulya & Helmi, 2017; Oktafarel et al., 2021). In addition to being consumed in the original form, nowadays there is much interest in both industry and research to use the mixture of spices and herbs to add the characteristics of the taste and effects or efficacy of the brewed coffee due to the presence of antioxidants as active compounds in spices and herbs that strongly contributing for health (Durak et al., 2017; Febrianto et al., 2015; Lestari et al., 2018).

Spices have their distinctive organoleptic properties (taste, aroma, color, and spiciness). In addition, spices provide health benefits for consumers because they have antioxidant,

antimicrobial, antidiabetic, antimutagenic, anti-inflammatory, and immunomodulatory effects. Spices are also a rich source of protein, lipids, vitamins and minerals. Roasted coffee beans consist of polysaccharides (38–42%), lipids (11-17%), protein (7.5–10%), aliphatic acid (1.6%), chlorogenic acid (2.5–3.8). %), caffeine (1.3–2.4 %), trigonelline (0.7–1%), minerals (4.5–4.7%), volatile compounds (0.1%) and melanoidins (23–25%). In addition to providing health benefits (for example, vasoconstrictor, neuroprotective and neurostimulator, antioxidant, anti-inflammatory, and anticarcinogenic), the content of caffeine, trigonelline, chlorogenic acid, and volatile compounds is related to the quality of coffee (Castillejos-Mijangos et al., 2022).

Spice coffee is a roasted coffee product that is added to a mixture of spices and brewed using hot water. One of the producer of spices coffee in Bondowoso district, Indonesia is a woman farmer group of Tanahwulan village. The product is manufactured by using various mixture of spices such as red ginger and cinnamon. Small red ginger (Z. officinale var. rubrum) has a higher essential oil than other types of ginger so it has a more pungent smell and taste. Red ginger and its active compounds are effective against various diseases in humans (Supu et al., 2019). Red ginger contains chemical compounds (gingerol, shogaol and zingerone) which have pharmacological effects such as antioxidant, anti-inflammatory, analgesic and anticarcinogenic (Febriani et al., 2018). Cinnamon is mainly used in the aroma and essence industry because of its fragrance. The most important constituent of cinnamon are cinnamaldehyde and transcinnamaldehyde (Cin), which present in the essential oil, thereby contributing to the aroma and various biological activities observed with cinnamon. Cinnamon bark contains procyanidins and catechins. Procyanidins extracted from cinnamon also show the antioxidant activity (Rao & Gan, 2014). Cinnamon has anti-inflammatory, antimicrobial, antioxidant, antitumor, cardiovascular, cholesterollowering, and immunomodulatory effects (Gruenwald et al., 2010). This business has good prospects for development but has not been studied in depth regarding its financial feasibility and development strategy. This study aims to assess the financial feasibility of the red ginger and cinnamon coffee business and its development strategy so that these products are highly competitive as a quality Indonesian agro-industrial product.

Methods

This research was a quantitative descriptive study using primary and secondary data. Primary data obtained by observations and questionnaires. Meanwhile, secondary data were obtained from various literatures. The data analysis methods used were financial feasibility analysis and SWOT analysis (Strengths, Weaknesses, Opportunities and Threats).

Research Stages

Determination of Financial Feasibility Analysis

Study of a business financial feasibility is an activity carried out in order to measure the extent of the benefits that can be obtained by conducting a business activity or a study to assess the feasibility of a business. The stages of a feasibility study involved of: 1) data and information collection, 2) data and information processing, 3) data analysis, 4) decision making, 5) recommendations. The feasibility analysis uses several methods as indicators of financial feasibility, such as Payback Period (PP), Net Present Value (NPV), Internal Rate Ratio (IRR), Benefit Cost Ratio (B/C Ratio) and Break Event Point (BEP). These methods has become a standard method for investment financial feasibility studies in various objects of study. These results will determine the strategies recommended for the product promotion (D.N. et al., 2021; Hendra et al., 2021; Sudiartini et al., 2020). The mathematical equations for each method of

financial feacibility analysis are outlined as follows (Fatmawati & Albaar, 2020; Hidayat et al., 2018; Lisnawati et al., 2021; Maia de Jesus et al., 2017).

Net Present Value (NPV)

NPV =
$$\sum_{t=0}^{n} \frac{R_t}{(1+i)^t} = \sum_{t=0}^{n} \frac{B_t - C_t}{(1+i)^t}$$

Notes:

Rt = Net cash flow at period-t

Bt = Benefit at year-t Ct = Cost at year-t I = Discount rate

t = The time of the cashflow or business period (at year-t)

n = The duration of project

Assessment of business investment is divided into three categories, namely: (i) NPV > 0, meaning that the business investment is feasible to run; (ii) NPV < 0, meaning that business investment does not make profits; (iii) NPV = 0, meaning that business investment is at a breakeven point.

Internal Rate of Return (IRR)

IRR =
$$i_1 + \frac{NPV}{(NPV_1 - NPV_2)}(i_2 - i_1)$$

Notes:

 $NPV_1 =$ Possitive NPV value equal to zero with capital interest of i_1 percent

NPV2 = Negative NPV value equal to zero with capital interest of i₂ percent

 $i_1 = \frac{\text{Discount rate}}{\text{Discount rate}}$ resulting in possitive NPV

i₂ = Discount rate resulting in negative NPV

The business indicator is said to be feasible if the IRR> MARR (Marginal Average Revenue Return) value. The MARR formulation is as follows

$$MARR = (1+i)(1+f) - 1$$

Notes:

i = investment interest rate

f = highest inflation

Net Benefit Cost Ratio (NBCR)

Net B/C =
$$\frac{\sum_{t=1}^{n} \frac{B_t - C_t}{(1+i)^t}}{\sum_{t=1}^{n} \frac{C_t - B_t}{(1+i)^t}}$$

Notes:

 B_t = Benefit at year-t

 C_t = Cost at year-t i = Discount rate

t = Time of a business period (year-t)

n = Duration of project

Investment criteria are assessed in two categories, namely (i) the value of Net B/C> 1, meaning that the investment is feasible to be implemented; and (ii) the value of Net B/C < 1, meaning that the investment is not feasible to be implemented.

Break-Even Point (BEP)

BEP is a point of the amount of production or sales that must be done so that costs incurred can be covered again or the value where the profit received is zero.

$$BEP Unit = \frac{FC}{P - VC}$$

Note:

VC = Variable cost

FC = Fixed Cost

P = Unit selling price

Payback Period

Payback period (PP) is the investment appraisal of a project based on the payment of investment costs based on the net benefits of the project.

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

PP = Payback Period

n = the last year where the amount of cash flow is still not biased to cover the initial investment

a = the amount of the initial investment

b = cumulative amount of cash flow in nth year

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

Payback Period Assessment Criteria: (a) If the Payback Period is shorter than the economic life of the business, then the business is declared feasible, (b) If the Payback Period is longer than the economic life of the business, then the project is declared ineligible.

The calculation of each formula (NPV, IRR, B/C Ratio, PP and BEP) will be used to assess the investment in each year therefore it can assist to answer the problem of research, and at last to draw the conclusions of study (Huda & Hakim, 2019). After conducting the calculation of each method, the sensitivity analysis will be carried out for further study investigation. Sensitivity analysis can show the sensitivity of business decisions if changes are made to the values of several variables that affect the businesss (D.N. et al., 2021). The sensitivity analysis was conducted to find out the performance of red ginger cinnamon coffee product as the result of the alteration of productivity and price. Simulation on the sensitivity analysis was 20% increase in raw material, 25% increase in raw materials and 3% decrease in selling prices, 10% increase in raw materials and 3% decrease in selling prices. This simulation will be executed to find out the performance of red ginger cinnamon coffee product investment to the benefits change.

Determination of SWOT Analysis

SWOT analysis is a tool used to systematically identify various factors to formulate strategies for an organization. This analysis is based on logic to maximize strengths and opportunities and minimize weaknesses and threats coped by the organization by taking into account the internal and external environment of an organization. The internal environment covers the

organization's strengths and weaknesses in the functional areas of the business, including aspects of management, marketing, finance/accounting, production operations, R&D and management information systems. Regarding the external environment, strategic planning monitors sectors originating from the external environment to determine opportunities and threats to the organization. Then formed an IFE (Internal Factor Evaluation) matrix and an EFE (External Factor Evaluation) matrix consisting of columns, weights, ratings, and the total value which is the result of multiplying the weights and ratings. The weight and rating column is filled in according to the value which is the result of grouping internal and external factors based on their level of importance. Furthermore, the IFE matrix is used to determine the strengths and weaknesses of the organization, while the EFE matrix is used to identify the external factors of the organization (Unpapar, 2021).

The Internal-External Matrix is a part of the General Electric model (GE-Model). The parameters used include the parameters of the organization's internal strength and external influences faced by the organization. The purpose of using this model is to obtain a more detailed corporate-level business strategy. The internal matrix is carried out by analysis and evaluation to find out the strengths and weaknesses of existing resources within the organization which leads to knowing the organization's performance. While the external matrix is carried out by analysis and evaluation to find out the opportunities that can be exploited and the threats that must be overcome to the operational, national and global environmental conditions which are predicted as initial ideas that have direct and/or indirect relationships with the main tasks of non-profit organizations (Sudiarto et al., 2021).

Results and Discussion

This financial feasibility analysis was conducted to find out whether this agro-industry business has an advantage with the investment made. The financial analysis of the red ginger and cinnamon coffee agroindustry business is carried out with several assumptions, including (1) the estimated business period is 5 years according to the estimated economic value of the tool; (2) depreciation is calculated using the straight-line method; (3) the interest rate used was 14% according to the estimated credit interest rate, (4) sensitivity calculation to determine the performance of this business if there are variables that may affect the sustainability of business.

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Table I	ACCCC1TV	tor mac	hines and	production	eallinment
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Description	Investment	Economical	Depreciation	Maintenance
11	value	value	(per year)	(10%)
1/ 4		(per year)	- N N	///
Coffee roasting pans	500000	5	90000	0
Coffee bean grinders	1000000	5	180000	100000
Spatula	120000	5	21600	0
Digital scale	340000	5	61200	0
Containers	240000	2	108000	0
Spoons	80000	2	36000	0
Sealers	125000	2	56250	0
Measure glasses	50000	2	22500	0
Glasses	300000	2		0
Knifes	25000	2		0
Stove	300000	2	135000	30000
Ground coffee sieves	50000	2	22500	0
TOTAL	3130000	-	733050	130000

Table 2. Operational Cost

No	Description	Cost (IDR/Year)
I.	Variable Cost	
1	Raw Materials	349443600
2	Support Materials	34500000
Total Variable Cost		383943600
II.	Fixed Cost	
1	Salary of workers	41400000
2	Depreciation	3665250
3	Maintenance	650000
Total Fixed Cost		45715250
Total Operational Cost		429658850

Source: Primary Data, 2022

Table 3. Selling Price of Red-Ginger and Cinnamon Coffee

No.	Description	Amount (IDR)
1.	Cost of Goods Sold	27822
2.	Profit (25%)	6955
Tota		34777
Selli	ng Price	35000

Source: Primary Data, 2022

The costs in the red ginger and cinnamon coffee agroindustry products consist of investment costs, operational costs. The investment costs consist of equipment and machinery used to support the red ginger and cinnamon coffee agroindustry. Details of investment costs can be seen in Table 1.1. Operational costs are costs whose amount is determined by the number of products produced. Operational costs consist of fixed costs, variable costs. The fixed costs of the red ginger and cinnamon coffee agroindustry consist of labor costs, machine depreciation costs and machine maintenance (Hidayat et al., 2018). Variable costs include costs of raw materials and costs of supporting materials. Total operational costs can be seen in Table 1.2.

The women farmer group in Tanahwulan Village can produce 50 units of red ginger and cinnamon coffee in a day (with a net weight of 150 grams per package). The cost of production is Rp. 27,822 with a selling price of Rp. 35,000 per package or in other words, the profit margin is 25% (Table 1.3). The conclusion of financial analysis of red ginger and cinnamon coffee was shown on Table 1.4. In the BEP calculation, the value for the BEP unit is 6368.8 which means that the product will be said to break even if the production reaches 6368.8 packages. While the value for the BEP (in Rupiah) was IDR. 177,192,754, meaning that the product will break even if it reaches those value.

The PBP value was 0.24 years or 2.88 months, which means that the payback period for this business is smaller than the investment period of 5 years. Seeing the results of the criteria above, this business investment is feasible to run. The calculation of NPV with a discount rate of 14% indicates that the NPV value is positive (>0), namely Rp. 180,769,662, which means that investments made up to the next 5 years have a current value benefit of Rp. 180,769,662. The IRR calculation results in an IRR value of 1412%, the value is greater than the MARR value of 227%. The IRR value of 1412% indicates that this business can return the capital if the loan interest rate reaches 1412% per year. The value of the B/C ratio of 1.12 means that every expenditure of IDR 1 will get a benefit of IDR of 0,12.

Table 4. Conclusion of Financial Analysis

No.	Parameter	Value
1	BEP	59858
2	PBP (year)	0.24
3	NPV	180769662.4
4	IRR	1412%
5	B/C ratio	1.12

Source: Primary Data, 2022

Table 5. Sensitivity Analysis

	Investment Criteria				
Parameter	NPV	IRR	Net B/C	Payback Period	BEP
25% Increase in Raw	-1560179.004	-5%	0.99	-0.304	66811.301
Material			4 3		
5% increase in raw materials and 3% decrease in selling prices	16053004.07	378%	1.01	0.661	75752.901
10% increase in raw materials and 3% decrease in selling prices	-786627.506	-37%	0.99	28.459	86229.405

Source: Primary Data, 2022

Table 1.6 Analysis of Internal and External Strategy Factors

Internal Strategy Factors	K \		
Strength (S)		Weakness (W)	
Production above standard	S_1	New products that are not well known to)
Good and attractive product packaging	S_2	the public	\mathbf{W}_1
Distinctive product taste	S_3	Limited use of production equipment	
Capital	S_4	capacity	W_2
Marketing	S_5	Limited availability of raw materials in	
		Certain season	W_3
		Coffee quality as random quality	
		coffee	W_4
Internal Strategy Factors	<i>i''i</i>	B V	
Opportunities (O)		Threat (T)	
The Presence of Nature Suitable for		Market competition	T_1
Coffee Development	O_1	Coffee Price Fluctuations	T_2
Support of Government	O_2	The scarce availability of spices during	the
Support of Community	O_3	COVID-19 pandemic	T_3
Means of Transportation Availability	O_4		
Development of IT and Communication	n O ₅		

Source: Primary Data, 2022

The sensitivity analysis, in its most general sense, is the study of how the 'output' of the 'system' is related to, and affected by, its 'inputs' (Razavi et al., 2021). Sensitivity is a business characteristic that is determined by measuring the effect of changes in certain factors on

changes in financial results. Influence is measured using the flexibility of the dependent variable in relation to the selected factors. One of the most important types of sensitivity analysis is that related to profit, which examines the degree of impact of factors such as: volume, sales price, variable costs and fixed costs on the level of operating profitability (Ciechan-Kujawa et al., 2018). The result of sensitivity analysis of this research was shown on Table 1.5. Based on those results, the most appropriate scenario was obtained on second scenario. The second scenario indicated the feasibility of business to be implemented when raw material price increased by 5% and selling price decreased by 3%. On the contrary, the first and third scenarios were not proper to be implemented to the business since those scenario were not fulfilling the investation criteria in the business feasibility analysis. The first scenario showed the negative value of NPV (-1560179.004), negative value of IRR (-5%), Net B/C below the value of one (0.99), and negative value of PP (-0.304). Meanwhile, the third scenario showed the negative value of NPV (-786627.506), negative value of IRR (-37%), Net B/C below the value of one (0.99), and longer PP (28.459).

The Internal and External Strategy Factors that affect this business were described on Table 1.6. Based on those results, the Strength of this business include of production above standard, good and attractive product packaging, distinctive product taste, capital and marketing. The weakness of this business include of new products that are not well known to the public, limited use of production equipment capacity, limited availability of raw materials in certain season and coffee quality as random quality coffee. The Opportunities of this business include of the presence of nature suitable for coffee development, support of government, support of community, means of transportation availability and development of IT and communication. The Threats of this business include of market competition, coffee price fluctuations, the scarce availability of spices during the COVID-19 pandemic

After identifying the internal and external strategy factors, then it should be followed by formed an IFE (Internal Factor Evaluation) matrix and an EFE (External Factor Evaluation) matrix consisting of columns, weights, ratings, and the total value. These values were obtained multiplying the weights and ratings. The final score of IFAS and EFAS were described on Table 1.7. The next step was to create a worksheet by drawing a cross that forms four quadrants, one each for strengths, weaknesses, opportunities and threats. The final score of IFAS and EFAS were then plotted on the diagram of SWOT Matrix of IFAS and EFAS (Figure 1).

Table 7. Final Score of IFAS and EFAS

IFAS	V L	EFAS		
Category	Score	Category	Score	
Strengths (S)	2,38	Opportunities (O)	2,25	
Weaknesses (W)	0,91	Threaths (T)	0,86	

Source: Primary Data, 2022

Based on figure 1, the position of IFAS (1,47) and EFAS (1,39) was located in Quadrant 1. Quadrant 1: In quadrant 1 situation, the business is in the most profitable situation. Position in quadrant 1 means that the organization has opportunities and strengths. The strategy that must be taken in this condition is to support an aggressive growth policy or growth oriented strategy by taking advantage of existing opportunities and internal strengths of the organization (Dwi Sulistiani, 2014).

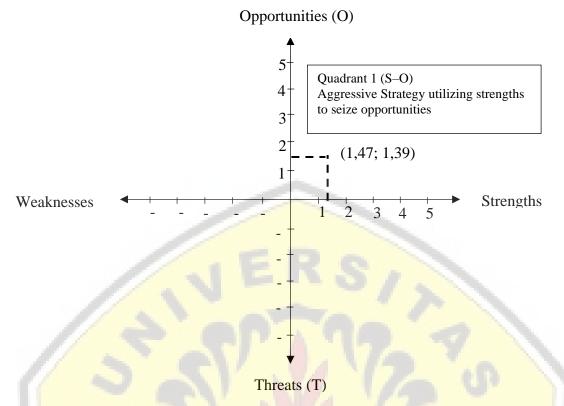


Figure 1. Red Ginger and Cinnamon Coffee Position Based on SWOT Matrix of IFAS and EFAS (Source: Primary Data, 2022)

Table 8. Strategic Plan Based on SWOT Analysis Results

External Factors	Opportunities	WY		7.71		
Internal Foots	Presence of Nature Suitable for Coffee Development	Support of Government	Support of Community	Means of transportation availability	The development of information and communication technology	
Internal Factors	1	2	3	5	6	
Strengths	Strategies of S-O (Strength-Opportunity)					
Production above						
standard	1. Increase the quantity of production with the support of abundant raw materials, government and group support.					
Good and attractive	2. Maintain pro			- 1 11	11.	
					poolzaging decigns to	
product packaging	3. Always innovate technical and product packaging designs to					
Distinctive product	attract consumers' attention					
taste	4. Always conduct market research so that the business has a good					
Capital	position among consumers					
Marketing		ion techi			ent of information and expand the reach of	

Source: Primary Data, 2022

Practical Implication of Study

This study will provide an information regarding the possibility of a business of red ginger-cinnamon coffee to gain fruitfulness during certain operation. Feasibility analysis application is crucial, mainly to avoid any failure when a business project is executed. Based on this study, the business of red ginger-cinnamon coffee is feasible to be implemented because it is fulfilling parameters used in measuring feasibility analysis. After it is known that the business is feasible to be executed, it is also important to analyse the strategy should be implemented in order to sustain the business. The SWOT analysis will help to observe the current position of bussiness (based on internal and external strategy factors) and taking the best strategy to sustain the business based on the existing condition.

Conclusion

The business financial analysis results explained that the business of Red Ginger-Cinnamon Coffee of Tanah wulan village was feasible to be executed. However, based on the sensitivity analysis among three scenarios, the business could not be existing if the first and third scenario were implemented. The second scenario which were 5% increase in raw materials and 3% decrease in selling prices still support the business to be executed. In order to support the business development of Red Ginger-Cinnamon Coffee of Tanah wulan village, based on SWOT Analysis, the business is in the most profitable situation. Therefore, it is necessary to apply the aggressive strategy or SO strategy by taking advantage of existing opportunities and internal strengths of the organization. Lastly, it is hoped that this product could exist in the global competition.

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