

Sustainable strategies for civet coffee production: A SWOT-AHP analysis

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Abstract

Civet (Luwak) coffee, renowned as an exclusive coffee product, has garnered significant attention within the agricultural industry. Nevertheless, the growth of this industry is not immune to environmental and social challenges that must be addressed to ensure sustainable production. This research aims to identify sustainable strategies applicable to civet coffee production through SWOT-AHP analysis. In this study, data collection was carried out by questionnaires and Focus Group Discussions (FGD) to obtain comprehensive insights and understanding of recognized SWOT elements. Subsequently, SWOT analysis based on AHP was systematically conducted using paired comparisons of these SWOT elements, enabling a quantitative assessment of their priorities. Based on the data obtained from A'WOT (Analysis of Weaknesses, Opportunities, and Threats) applied to civet coffee and integrated into SWOT mapping and strategy matrices, the analysis revealed that the highest scores for strengths, weaknesses, opportunities, and threats were high price level (52%), production limitations (69%), increased conservation awareness (72%), and ethical production issues (72%). The Civet coffee company can ensure long-term sustainability by maintaining the originality of Luwak coffee, prioritizing civet conservation, upholding ethical production standards, obtaining sustainability certifications, implementing transparency, strengthening its CSR program, and remaining vigilant about industry regulations. These strategic steps will not only address ethical concerns and competition but also enhance the company's reputation and build consumer trust, establishing a solid foundation for sustained success.

Keywords: Civet coffee; SWOT-AHP; Strategy; Sustainable; Ethical production issues

1. Introduction

Civet coffee, also known as Luwak coffee, has earned a distinguished reputation as one of the world's most exclusive and sought-after coffee products [1]. Besides that, it is also known as one of the world's most expensive coffees [2]. Its unique production process, involving civet's ingestion and subsequent excretion of coffee cherries, imparts a distinctive flavor profile that commands premium prices in global markets. Civet coffee is derived from two distinct production processes: natural civet coffee, also known as wild civet coffee, and cultivated civet coffee, often produced in cages. Originally, civet coffee was collected naturally by gathering civet feces from coffee plantations near forests. However, as production quantities were limited, farmers shifted towards cultivating civets in cages to increase output [2][3].

However, the allure of this exquisite beverage is not immune to the environmental and social challenges that pervade the agricultural industry. Civet, often marketed as a rare coffee variety, is produced through a process that unfortunately does not thoroughly prioritize or uphold high standards of animal welfare for the animals involved [4][5][6]. In light of these challenges, this research endeavors to uncover and propose sustainable strategies for civet coffee production through the innovative application of a SWOT-AHP analysis.

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To develop a strategy effectively, it is crucial to conduct a SWOT analysis [7], which assesses both external opportunities and threats and internal strengths and weaknesses. One method to enhance this analysis is utilizing the Analytic Hierarchy Process (AHP), a multi-criteria decision-making approach [8]. Strategic management comprises three essential steps: formulation, implementation, and strategy evaluation. In this study, a quantitative AHP-based SWOT analysis has been proposed. It systematically evaluates the priorities among SWOT components through pairwise comparisons. The eigenvalue method is employed within AHP to calculate priorities and ascertain the relative significance of each SWOT factor. Overall, the SWOT-AHP technique is valuable for analyzing strategic decisions, aiding organizations in making well-informed choices based on a comprehensive evaluation of their internal and external factors.

Like many other agricultural sectors, the civet coffee industry not only focuses on maintaining the quality of civet coffee but also faces pressing concerns related to ecological sustainability, ethical production practices, and social responsibility. This study seeks to delve into these complexities and provide a comprehensive framework for addressing the sustainability of the coffee industry.

2. Material and methods

Data collection was meticulously conducted through questionnaires and Focus Group Discussions (FGD) to achieve this. These methods were instrumental in gathering profound insights and understanding the intricacies of the recognized SWOT elements associated with civet coffee production. The SWOT-AHP analysis, a robust quantitative approach, was subsequently applied to assess the priorities of these identified SWOT elements systematically. By accurately evaluating the strengths, weaknesses, opportunities, and threats, this analysis allows for the development of sustainable strategies that can bolster the civet coffee industry's resilience and vitality.

3. Results and discussion

Based on these considerations, the author seeks to delineate the internal and external factors that enable the identification of various strategic options that can be pursued in this industry. Civet coffee possesses strengths and weaknesses (internal factors) and opportunities and threats (external factors) that must to be considered.

Regarding strengths, civet coffee has several advantages that can serve as a strategic foundation. Firstly, its high price point (S1) reflects exclusivity and offers the potential for substantial revenue for producers. Secondly, its exclusive image (S2) appeals to consumers seeking a unique experience. Its unique flavor (S3), derived from the unique production process involving civets, also sets it apart in the coffee world. Furthermore, the potential for sustainable marketing (S4) lies in the global community of civet coffee enthusiasts, opening up opportunities for global marketing.

On the other hand, weaknesses in the civet coffee business should be considered. Firstly, the high price point (W1) makes it unaffordable for many consumers. Secondly, production limitations (W2) arise due to the complex production process and the limited population of civets involved. Lastly, ethical production controversies (W3) surround the process, raising questions about the ethics and welfare of animals.

Regarding opportunities, the continuously growing premium coffee market (O1) can become a part of this trend. Product diversification (O2), such as developing derivative products or single-serve civet coffee sachets, presents an opportunity. Furthermore, increased conservation awareness (O3) and support for ethics and animal welfare in the coffee industry can open doors to improving the civet Coffee production process.

Meanwhile, threats include competition from other premium coffee types (T1), locally and internationally, which may reduce Civet Coffee's market share. Ethical production issues (T2) can create negative consumer perceptions, diminishing their interest in purchasing civet coffee products. Changes in regulations (T3) related to ethical production or sustainability could also impact the civet coffee industry.

Based on the SWOT analysis conducted through FGD on civet coffee, it was found that both internal and external factors for civet coffee are identified, as shown in Table 1. The results of the SWOT factor comparison can be seen in Table 2. The analysis of the comparison of SWOT factor importance levels was conducted by inputting criteria and alternatives into the paired comparison matrix. This analysis found that the threat factors have the highest ratio at 41%, followed by opportunity factors at 28%, strength factors at 19%, and weakness factors at 12%. The paired comparison of SWOT also yielded a CR value of 0.1. A CR value of ≤ 0.1 indicates that the expert decisions have good consistency, making them acceptable and suitable for decision-making processes.

Civet coffee possesses several key strengths, including its high price level, exclusive image, unique flavor, and potential for sustainable marketing. Civet coffee consumed by wild civets or intentionally raised civets in enclosures, as seen in Lampung and other regions, has seen significant development [9]. With its high price, which reflects the scarcity of coffee beans and the effort required to produce them, civet coffee attracts consumers seeking a unique coffee experience. Its unique flavor, resulting from the civet's digestive process, sets it apart from most other coffees. With the potential for sustainable marketing, civet coffee has opportunities for continued growth and global marketing, maintaining its status as one of the exclusive and unique coffees [10]. Based on the joint assessment of experts listed in Table 3, the results indicate that the high price level is the strength with the highest weight at 52%, followed by the exclusive image at 34%, unique flavor at 10%, and potential for sustainable marketing at 5%. The obtained CR value is $0.09 \leq 0.1$, indicating that the expert decisions have an acceptable and consistent level for decision-making.

The high price makes it one of the most expensive coffees available today. A cup of civet coffee ranges from \$35 to \$80, and one pound of coffee beans can cost between \$100 and \$600. However, civet coffee is hard to come by, as only 500-700 kg is produced annually [2]. This scarcity is one of the weaknesses in civet coffee production. Nevertheless, with its high price compared to other coffees, it tends to be purchased by the middle to upper class [11]. However, this is not necessarily a complete weakness for civet coffee. Another aspect to consider is the ethics of production. For those who wish to raise civets or produce civet coffee, they need to prepare enclosures that meet the minimum dimensions set out in Law No. 37 Minister of Agriculture Regulation of the Republic of Indonesia, 2015, which is at least 18 square meters (2 meters x 3 meters x 3 meters) for a single civet. These enclosures must be cleaned and sterilized daily. The enclosures should also be enriched with branches and platforms for climbing activities, with a fully enclosed nest box at a height of 2 meters above the ground, as well as other vegetation to reduce stereotypical behaviors in civets and allow them to exhibit nocturnal activities as observed in wild civets. The enclosures should not have wire or wooden slats for the floor. Nest boxes should be lined with soft, absorbent bedding materials that can be easily disposed of daily to maintain hygiene. Recommended materials include straw, bamboo, or banana leaves. If civets live in outdoor enclosures, these should have pitched thatch or tiled roofs to channel rainwater into drainpipes and guttering [12]. Based on the weakness assessment presented in Table 4, the paired comparison matrix was used to determine the weight of weaknesses. The results show that the most significant weakness affecting civet coffee is production limitations, with a weight percentage of 69%, followed by ethical production controversies at 19% and high price levels at 12%. The obtained CR value is $0.04 \leq 0.1$, indicating that the expert decisions have an acceptable and consistent level for decision-making.

Recently, more people have been concerned about ethics and animal welfare in the coffee industry. Awareness and attention to the civet or musang's well-being in its production are crucial. The husbandry, shelter, and enrichment in animal markets, pet trade, and civet coffee plantations require urgent review, standardization, improvement, and enforcement of regulations. If not addressed promptly, this trade should be halted. The current welfare standards for exotic animal husbandry in Indonesia promote poor shelter, inadequate diets for animals, and poor hygiene, and harm the behavioral repertoire of species, which can lead to cage-related psychosis and premature death [5][13][14][15][16]. With strong support for more ethical production practices, there is an opportunity for civet coffee producers to improve their production processes and ensure the welfare of civets. Table 5 shows the paired comparison matrix to determine the highest probability weight. The results indicate that the most significant opportunity affecting civet coffee is the increased conservation awareness, with a weight percentage of 72%, followed by the premium coffee market growth at 19% and product diversification at 8%. The obtained CR value is $0.05 \leq 0.1$, indicating that the expert decisions have an acceptable and consistent level for decision-making.

In terms of threats identified, they include competition, negative perceptions, and regulatory changes. The paired comparison matrix was used to determine the weight of the highest threats, as seen in Table 6. The results indicate that the most significant threat affecting civet coffee is negative perceptions, with a weight percentage of 72%, followed by regulatory changes at 19% and competition at 8%. These negative perceptions are related to the information that has spread that civet coffee, originating from civets confined in small cages, portrays civet coffee production as controversial regarding the treatment of animals, as revealed in BBC investigative reports in Sumatra [17]. Additionally, as reported in CNBC Indonesia, despite being a protected species under the Convention on International Trade in Endangered Species of Wild Fauna and Flora, Asian palm civets are often captured at around six months old, confined in filthy cages covered with feces, waste, and rotting coffee cherries. They are rarely fed anything other than coffee cherries [18].

This is done to produce civet coffee. This beverage is sold worldwide for more than Rp 1 million per cup. The AHP for threats yields a CR value of $0.05 \leq 0.1$, indicating that the expert decisions have an acceptable and consistent level for decision-making.

Paired comparisons for all SWOT factors are displayed in Table 7 and Figure 1. Based on the SWOT analysis, the percentages for each SWOT factor are strength (19%), weakness (12%), opportunity (28%), and threat (41%). Priority

scores for all SWOT factors show that the highest score in each row for strength is the high price level (52%), for weakness is production limitations (69%), for opportunity, is increased conservation awareness (72%), and for threat is ethical production issues (72%).

To identify four conceptually different strategic groups for creating alternative strategies, a detailed analysis of Strengths-Opportunities (SO), Weaknesses-Opportunities (WO), Strengths-Threats (ST), and Weaknesses-Threats (WT) is presented in Table 8. Comparisons Matrix of Threats Group

Table 1 SWOT Matrix of Civet Coffee

Strength (S)	Weakness (W)
(S1) High Price (S2) Exclusive Image (S3) Unique Flavor (S4) Sustainable Marketing Potential	(W1). High Price (W2). Production Limitations (W3). Production Ethics Controversy
Opportunity (O)	Threat (T)
(O1). Premium Coffee Market (O2). Product Diversification (O3). Conservation Awareness	(T1). Competition (T2). Production Ethics Issues (T3). Regulatory Changes

Table 2 Pairwise Comparisons of SWOT Factors

SWOT Groups	S	W	O	T	Priority
<i>Strength (S)</i>	1.00	3.00	0.50	0.33	0.19
<i>Weakness (W)</i>	0.33	1.00	0.33	0.50	0.12
<i>Opportunity (O)</i>	2.00	3.00	1.00	0.50	0.28
<i>Threat (T)</i>	3.00	2.00	2.00	1.00	0.41
CR = 0.1					

Table 3 Comparisons Matrix of Strengths Group

SWOT Groups	S1	S2	S3	S4	Priority
(S1) High Price	1.00	3.00	5.00	7.00	0.52
(S2) Exclusive Image	0.33	1.00	7.00	7.00	0.34
(S3) Unique Flavor	0.20	0.14	1.00	3.00	0.10
(S4) Sustainable Marketing Potential	0.14	0.14	0.20	1.00	0.05
CR = 0.09					

Table 4 Comparisons Matrix of Weaknesses Group

SWOT Groups	W1	W2	W3	Priority
(W1). High Price	1.00	0.20	0.50	0.12
(W2). Production Limitations	3.00	1.00	7.00	0.69
(W3). Production Ethics Controversy	2.00	0.14	1.00	0.19
CR = 0.04				

Table 5 Comparisons Matrix of Opportunities Group

SWOT Groups	O1	O2	O3	Priority
(O1). Premium Coffee Market	1.00	3.00	0.20	0.19
(O2). Product Diversification	0.33	1.00	0.14	0.08
(O3). Conservation Awareness	5.00	7.00	1.00	0.72
CR = 0.05				

Table 6 Comparisons Matrix of Threats Group

SWOT Groups	T1	T2	T3	Priority
(T1). Competition	1.00	0.14	0.33	0.08
(T2). Production Ethics Issues	7.00	1.00	5.00	0.72
(T3). Regulatory Changes	3.00	0.20	1.00	0.19
CR = 0.05				

Table 7 Overall Priority for The SWOT Groups and Factors

SWOT Groups	Group Priority	SWOT Factor	Priority Within Group	Overall Priority Factor
<i>Strength (S)</i>	0.19	(S1) High Price	0.52	0.099
		(S2) Exclusive Image	0.34	0.065
		(S3) Unique Flavor	0.10	0.019
		(S4) Sustainable Marketing Potential	0.05	0.010
<i>Weakness (W)</i>	0.12	(W1). High Price	0.12	0.014
		(W2). Production Limitations	0.69	0.083
		(W3). Production Ethics Controversy	0.19	0.023
<i>Opportunity (O)</i>	0.28	(O1). Premium Coffee Market	0.19	0.053
		(O2). Product Diversification	0.08	0.022
		(O3). Conservation Awareness	0.72	0.202
<i>Threat (T)</i>	0.41	(T1). Competition	0.08	0.033
		(T2). Production Ethics Issues	0.72	0.295
		(T3). Regulatory Changes	0.19	0.078

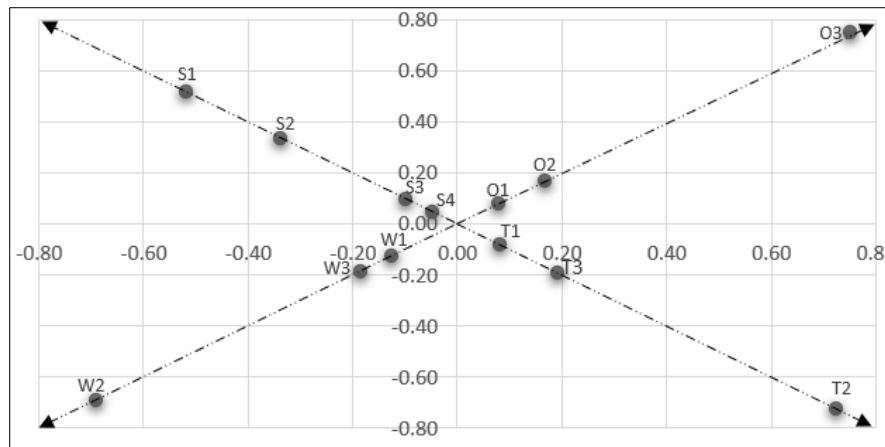


Figure 1 The plotting of the relative importance of Civet Coffee

Table 8 SWOT Strategy Matrix

Internal dan External Factors	<p><i>Strength (S)</i> (S1) High Price (S2) Exclusive Image (S3) Unique Flavor (S4) Sustainable Marketing Potential</p>	<p><i>Weakness (W)</i> W1). High Price (W2). Production Limitations (W3). Production Ethics Controversy</p>
<p><i>Opportunity (O)</i> (O1). Premium coffee Market (O2). Product Diversification (O3). Conservation Awareness</p>	<p><i>Strengths Opportunities (SO)</i> Sustaining originality and enhancing the exclusive image through positive consumer reviews (S1, S2, S3, S4, O1, O3). Introducing minimalist civet coffee sachets (S1, S4, O1, O2).</p>	<p><i>Weakness Opportunities (WO)</i> Conducting research and innovation to enhance the efficiency of civet coffee production processes without compromising quality (W1, W2, W3, O1, O2, O3).</p>
<p><i>Threat (T)</i> (T1). Competition (T2). Production Ethics Issues (T3). Regulatory Changes</p>	<p><i>Strengths Threats (ST)</i> Increasing the population and ensuring the well-being of civets through conservation and civet breeding programs (S4, T1, T2, T3). Actively engaging in discussions with regulatory authorities and industry associations to influence the sustainability of civet coffee production (S1, S2, S3, S4, T1, T2, T3).</p>	<p><i>Weakness Threats (WT)</i> Seeking certification for the sustainability and ethical production of civet coffee and implementing Corporate Social Responsibility (CSR) programs (W1, W2, W3, T1, T2, T3). Committing to production transparency and providing clear information about the civet coffee production process (W3, T2, T3).</p>

In strengths opportunities, to maintain the originality of Civet coffee and improve its exclusive image, it is essential to encourage positive consumer reviews. This can be achieved by consistently delivering high-quality products and exceptional customer experiences. Positive reviews reinforce the perception of exclusivity and highlight the unique flavor of civet coffee related to its distinctive production process involving civets. Leveraging these strengths, along with the opportunities presented by the growing premium coffee market and increasing conservation awareness, can help enhance the brand's image. Additionally, addressing the weakness of affordability can be achieved by introducing minimalist civet coffee sachets. These sachets offer a more accessible and convenient option for consumers who may find the traditional civet coffee pricing prohibitive. Providing this alternative way while maintaining the brand's exclusivity, Civet Coffee can tap into new consumer segments and capture a larger market share, especially in regions where sachet coffee products are popular. In summary, by capitalizing on its strengths and opportunities, Civet Coffee can reinforce its exclusive image and expand its market reach through positive consumer reviews and minimalist coffee sachets. This strategic approach aligns with the unique characteristics and challenges of the civet coffee industry.

To address the weaknesses in civet coffee production, which include high production costs, production limitations, and ethical controversies, it is essential to embark on research and innovation. This strategic initiative aligns with the opportunities presented by the growing premium coffee market, the potential for product diversification, and the increasing emphasis on conservation and ethical production. Efforts should be focused on finding ways to streamline production processes, reduce costs, and increase the output of high-quality civet coffee. Research can lead to the development of innovative techniques that optimize the care and management of civets, thereby addressing the limitations in production and potentially alleviating ethical concerns. Additionally, exploring new technologies and methodologies can help maintain or enhance civet coffee's unique flavor and quality. By investing in research and innovation, Civet Coffee can overcome its internal weaknesses and capitalize on external opportunities. This approach is crucial for the long-term sustainability and growth of the civet coffee business while ensuring its commitment to quality and ethical production remains intact, such as the availability of civet animals, the availability of coffee cherries, the food and nutritional intake for the animals; the availability of healthy enclosures for civets.

In strengths threats to address the strengths and threats associated with civet coffee production, active involvement in discussions with relevant authorities and industry associations is paramount. This engagement aligns with the strengths of exclusivity, unique flavor, and potential for sustainable marketing while also addressing the threats of competition from other premium coffee types, ethical production issues, and regulatory changes. By participating in these discussions, Civet Coffee can advocate for regulations and practices that support the sustainability and ethical production of civet coffee. This may include advocating for guidelines that ensure the well-being of civets and promote ethical treatment throughout the production process. It can also involve working with industry associations to establish standards and certifications that validate civet coffee producers' ethical and sustainable practices. Such efforts can reinforce the exclusivity and positive image of civet coffee in the eyes of consumers while mitigating threats associated with ethical concerns and regulatory changes. Furthermore, to address the strengths and threats tied to the civet coffee industry, a proactive approach involves bolstering civet populations and ensuring their welfare. This strategy aligns with the strength of potential sustainable marketing and counters threats related to competition from other premium coffee types, ethical production issues, and regulatory changes. Implementing conservation programs and civet breeding initiatives can help bolster the civet population, ensuring a stable coffee bean supply. Additionally, these efforts underscore a commitment to ethical production and animal welfare, which can alleviate consumer concerns and influence regulatory decisions. In summary, engaging in discussions with relevant authorities and industry associations to promote sustainability and advocating for ethical practices in civet Coffee production can help capitalize on strengths and mitigate threats. Simultaneously, focusing on the well-being and conservation of civets addresses both strengths and threats, contributing to the long-term success of the civet coffee industry.

In Weakness Threats, it is crucial to pursue certification that attests to civet coffee production's sustainability and ethical practices to address the weaknesses related to production costs, production limitations, and ethical controversies. This strategic move also helps mitigate threats from competition with other premium coffee types and ethical production concerns. Certification is a tangible demonstration of the commitment to ethical and sustainable production practices, addressing the concerns associated with the production process. Moreover, implementing CSR programs can further underscore this commitment, benefiting society and the environment. CSR initiatives can encompass community engagement, environmental conservation, and support for ethical farming practices, all of which contribute to Civet Coffee's overall image and sustainability. Furthermore, a solid commitment to transparency is essential to tackle weaknesses related to ethical concerns and threats associated with negative consumer perceptions and regulatory changes. Civet coffee producers should provide comprehensive information about their production methods, emphasizing ethical treatment of civets and adherence to sustainable practices. By being transparent about the production process, civet coffee can dispel doubts regarding ethical concerns and potentially alleviate negative consumer perceptions. This transparency also positions the industry favorably in the event of regulatory changes related to ethical production or sustainability, as it demonstrates a proactive commitment to responsible practices. In summary, seeking certification for sustainability and ethical production and implementing CSR programs address internal weaknesses and external threats. Simultaneously, committing to transparency in the production process helps overcome ethical concerns and prepares the civet coffee industry for potential regulatory changes. These actions collectively contribute to civet coffee's long-term viability and positive reputation.

4. Conclusion

The highest scores were assigned to strengths (52%) represented by the high price level, weaknesses (69%) indicated by production limitations, opportunities (72%) signifying increased conservation awareness, and threats (72%) relating to ethical production issues. The Civet coffee company must consider several strategic options to ensure long-term sustainability. Firstly, the company should prioritize civet conservation and adhere to high ethical production standards. This approach will help address ethical production and competition concerns while fostering a positive

consumer reputation. Unethical production practices in civet coffee often stem from exploiting civets to maximize profits without regard for their psychological well-being. Obtaining sustainability certifications is crucial to building consumer trust. Additionally, the company should implement transparent practices throughout its production process and keep the quality's originality and bolstering its corporate social responsibility (CSR) program. These measures will effectively address ethical production concerns and enhance the company's reputation in the eyes of consumers. Lastly, the company must remain vigilant regarding potential changes in industry regulations. Monitoring regulatory shifts and preparing for adaptation, if necessary, is a prudent step to mitigate potential issues that could disrupt business operations. The Civet coffee company can establish a solid foundation for long-term sustainability by taking these strategic steps.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare that there is no conflict of interest.

References

- [1] Kementerian Perdagangan, 'Pesona Kopi Luwak', *War. Ekspor Ed. Juli 2013*, 2013, [Online]. Available: Ditjen PEN/MJL/004/7/2013 Juli.
- [2] I. B. Smith, *Kopi Luwak Coffee: World's Most Expensive Coffee Beans from Civet Poop Or an Urban Myth?: Facts and Information on History, where it is Grown, Habitat of Civet-Its Daily Care, Breeding, Premium Coffee Imitation, Cost, Places to Buy, Coffee Making Process*. IBS Publishing Limited.
- [3] I. . Panggabean, *Buku pintar kopi*. AgroMedia, 2011.
- [4] A. TOPSFIELD, J. & ROSA, 'Famous faeces: the story behind the civet-poo coffee craze', 2016.
- [5] G. Carder, H. Proctor, J. Schmidt-Burbach, and N. D'Cruze, 'The animal welfare implications of civet coffee tourism in Bali', *Anim. Welf.*, vol. 25, no. 2, pp. 199–205, 2016, doi: 10.7120/09627286.25.2.199.
- [6] C. W. Cahill, *Feral natures and excremental commodities: purity, scale, and the more-than-human in Indonesia*. University of California, Irvine., 2017.
- [7] H. H. Chang and W. C. Huang, 'Application of a quantification SWOT analytical method', *Math. Comput. Model.*, vol. 43, no. 1–2, pp. 158–169, 2006, doi: 10.1016/j.mcm.2005.08.016.
- [8] T. L. Saaty, *The Analytic Hierarchy Process*. McGraw–Hill, New York., 1980.
- [9] C. Wulandari and W. Caroko, 'COMMUNITY FOREST ENTERPRISE PRODUCTS and its correlation to COMMUNITY BASED FOREST MANAGEMENT in INDONESIA', 2013.
- [10] Warta Ekspor, 'Specialty Kopi Indonesia', no. Ditjen PEN/MJL/13/II/2018, 2018, [Online]. Available: http://djpen.kemendag.go.id/app_frontend/admin/docs/publication/9321548126511.pdf.
- [11] T. Wicaksono, 'Production Process and Consumer Perception of Luwak Coffee (Case at PTPN XII Kalisat , Bondowoso and Care Rollas Surabaya , East Java)', vol. 16, no. 2, pp. 27–31, 2022, doi: 10.35335/ccria.
- [12] K. Pertanian, 'Peraturan Menteri Pertanian Republik Indonesia Nomor 37/Permentan/Kb. 120/6/2015 Tentang Cara Produksi Kopi Luwak Melalui Pemeliharaan Luwak Yang Memenuhi Prinsip Kesejahteraan Hewan.', 2015.
- [13] C. R. Shepherd, 'Civets in trade in Medan, North Sumatra, Indonesia (1997 – 2001) with notes on legal protection', *Small Carniv. Conserv.*, vol. 38, no. February, pp. 34–36, 2008.
- [14] C. R. Shepherd, 'Illegal primate trade in Indonesia exemplified by surveys carried out over a decade in North Sumatra', *Endanger. Species Res.*, vol. 11, no. 3, pp. 201–205, 2010, doi: 10.3354/esr00276.
- [15] C. R. Shepherd, 'Observations of small carnivores in Jakarta wildlife markets , Indonesia , with notes on trade in Javan Ferret Badger *Melogale orientalis* and on the increasing demand for Common Palm Civet *Paradoxurus hermaphroditus* for civet coffee production Abstract', *Small Carniv. Conserv.*, vol. 47, no. December, pp. 38–41, 2012.

- [16] K. A. I. Nijman, V., Spaan, D., Rode-Margono, E. J., Roberts, P. D., Wirdateti, N. K., & Nekaris, 'Trade in common palm civet *Paradoxurus hermaphroditus* in Javan and Balinese markets, Indonesia. *Small Carnivore Conservation.*', vol. 51, pp. 11–17, 2014.
- [17] BBC Indonesia, 'Kopi luwak sebagai kekejaman hewan', 2013, [Online]. Available: https://www.bbc.com/indonesia/majalah/2013/09/130915_majalahlain_kopi.
- [18] CNBC Indonesia, 'Penampakan Musang Luwak RI yang Tersiksa Demi Kopi Rp 1 Juta.', 2020, [Online]. Available: <https://www.cnbcindonesia.com/news/20200909110316-4-185472/penampakan-musang-luwak-ri-yang-tersiksa-demi-kopi-rp-1-juta>.