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CONTRIBUTION OF CITES APPENDIX II SNAKE EXPORTS TO INDONESIA'S NON-TAX REVENUE

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ABSTRACT

The trade of snakes listed in CITES Appendix II plays a pivotal role in conservation and contributes to Indonesia's economy through non-tax state revenue. This study examines the volume and trends of Appendix II snake exports from 2020 to 2024, their contribution to non-tax state revenue, and how wildlife trade is monitored as part of conservation efforts. This study uses a mixed-methods approach, merging quantitative analysis of secondary data from the CITES trade database with qualitative interviews conducted at the Ministry of Forestry. Specifically, in-depth interviews were held with two key informants, both serving as Forest Ecosystem Management Officers (*Pengendali Ekosistem Hutan*/PEH) at the Directorate of Species and Genetic Conservation. The results indicate that the snake skin category has the largest total volume, amounting to 1,378,878 pieces, and generates the highest non-tax state revenue, reaching IDR 2,794,006,380.00. Meanwhile, live snakes, leather products, meat, gallbladders, and garments show declining export trends. Conversely, the export trend for skin pieces is increasing. Rather than a broad shift toward fully processed downstream products, this trend indicates a specific shift toward intermediate commodities, as the export of finished leather products has concurrently declined. Currently, trade management is conducted through a quota system and physical verification to ensure legality. This shift and the development of captive breeding demonstrate adaptation to conservation, sustainability, and international market preferences.

INTRODUCTION

The rise in global wildlife trade requires governments to balance the utilization of natural resources with conservation efforts. Governments have to prioritize the enforcement of strict national and international laws to safeguard primate populations, as this is a fundamental prerequisite for maintaining the health of ecosystems that benefit both wildlife and human communities globally (Estrada et al., 2024). As a country that has ratified the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Indonesia is obligated to ensure that wildlife trade is conducted legally, in a controlled manner, and sustainably to preserve biodiversity (Naiborhu, 2021). Globally, the substantial scale of this trade involves millions of specimens annually, creating a critical link between international market demand and the necessity for effective regulatory frameworks to prevent over-exploitation. The effectiveness of these frameworks is highly contingent upon the alignment between national legislation and international standards, as inconsistencies can undermine global conservation strategies. Furthermore, scholars emphasize that without rigorous mechanisms for verifying legal acquisition, legal trade channels risk being exploited to launder illegally obtained specimens. Consequently, continuous adaptation of regulatory mechanisms is essential to address contemporary challenges, including the rise of online wildlife trade, to ensure that trade remains within sustainable limits (Chotimah, 2024). Furthermore, national enforcement and formal trade frameworks are strongly complemented by locally embedded governance and autonomous conservation practices, which provide vital informal protection for ecosystems and vulnerable species throughout diverse Indonesian landscapes (Bong et al., 2026).

The trade of snakes and their byproducts represents one of the most heavily traded commodities in the global market, with numerous species listed under CITES Appendix II (Valofi & Satria, 2025). Indonesia has consistently recorded significant export volumes of leather products and skins between 2020 and 2024. Beyond its role as a significant economic activity, which generated an estimated non-tax state revenue of IDR 2,794,006,380 during this period, this trade also presents serious ecological concerns. According to Hughes (2021), a primary challenge in this sector is that legal trade status is frequently conflated with biological sustainability, despite a persistent lack of robust data regarding wild populations and actual offtake levels. Consequently, establishing a comprehensive understanding of export trends is essential. This is critical to reconcile the escalating international market demand with the biological limits of the species and the state's fiscal objectives, thereby preventing the depletion of wild populations that could ultimately jeopardize the livelihoods of local communities (Hughes et al., 2023). Therefore, policymakers must integrate robust population monitoring into regulatory frameworks to guarantee long-term resource security. Furthermore, such formal state-led regulations need to account for or align with local autonomous conservation practices and informal governance, which significantly shape actual resource use and species protection on the ground (Bong et al., 2026).

To operationalize this balance between conservation and economic objectives, the government has institutionalized revenue collection through specific administrative frameworks. Legal wildlife trade contributes directly to the state treasury through export permit fees, regulated under Minister of Environment and Forestry Regulation No. 86 of 2016 on benchmark prices for wild flora and fauna, and Government Regulation No. 36 of 2024 on the types and rates of Non-Tax State Revenue (*Penerimaan Negara Bukan Pajak*/PNBP) applicable to the Ministry of Environment and Forestry. This mechanism demonstrates how structured wildlife utilization can create a measurable economic contribution while maintaining legal oversight. This systematic approach to revenue mobilization is consistent with recent findings, which indicate that government effectiveness serves as a primary determinant of non-tax revenue performance by enhancing institutional capacity to manage administrative fees and public assets efficiently (Sinaga et al., 2026). Furthermore, shifting from estimation-based to volume-based collection

mechanisms, as evidenced in the fisheries sector, can enhance the accuracy of revenue mobilization by aligning financial levies with actual commercial activity, thereby bridging the gap between regulatory control and economic incentives (Arkan & Rosdiana, 2025). Through analyzing the revenue generated from these exports, the government can effectively bridge the gap between regulatory control and the economic incentives provided by the trade, ensuring that the financial contributions reflect the actual volume of commercial activity in the field (Yahya, 2025). Ultimately, this structural transition suggests that successful non-tax revenue reform is not only about increasing rates, but about building an administrative framework that integrates precise data validation with consistent regulatory enforcement.

However, while the regulatory framework for revenue collection has been established in principle, its empirical application specifically relating to Appendix II snake exports remains under-researched. Despite the economic and conservation significance, research on the volume and trends of Appendix II snake exports and their direct impact on state finances remains limited. Previous studies, such as those by Anggriawan (2024) and Martono et al. (2026), have primarily focused on regulatory compliance and administrative licensing frameworks without integrating empirical data on trade volume or corresponding state revenue, leaving a critical gap in understanding the economic conservation. These limitations prompted this study to analyze CITES international trade data from 2020 to 2024. This study aims to describe the volume and trends of Appendix II snake exports from Indonesia, determine their specific contribution to non-tax state revenue, and examine their relationship with trade oversight and conservation efforts.

METHOD

Time and Location

This study was conducted in February 2026. Primary data collection via semi-structured interviews was carried out at the Directorate of Species and Genetic Biodiversity Conservation, Ministry of Forestry, located in Jakarta, Indonesia. The scope of secondary data analysis covers the official CITES trade records from 2020 to 2024. This study received institutional approval, and all participants provided informed consent prior to the interviews. Furthermore, the confidentiality and anonymity of all interviewees were strictly maintained in accordance with ethical research standards.

Materials and Tools

The tools utilized in this study included a laptop, Microsoft Excel for data tabulation, Microsoft Word for manuscript drafting, and a semi-structured interview guide. Primary data were gathered through the interviews with the Ministry of Forestry. Meanwhile, secondary data were compiled from the CITES Trade Database for the 2020-2024 period, supplemented by relevant legal documents, including the Minister of Environment and Forestry Regulation No. 86 of 2016 on benchmark prices for wild flora and fauna, Minister of Environment and Forestry Regulation No. 18 of 2024 on the utilization of wild flora and fauna species for captive breeding, keeping for hobby, trade, and exhibition, and Government Regulation No. 36 of 2024 on the types and rates of PNBP applicable to the Ministry of Forestry.

This study adopted a purposive sampling strategy to identify key informants who possess direct authority and comprehensive knowledge regarding export permit issuance and non-tax state revenue management. We conducted in-depth, semi-structured interviews with two primary officials who serve as the designated experts and lead administrators for these regulatory processes within the Directorate. Given their central role in the decision-making process, these informants were chosen for their unparalleled access to the required data and policy implementation insights, ensuring high-quality, authentic information relevant to the research objectives.

Method and Data Analysis

Annual Export Volume Analysis

Data were aggregated annually by category to determine volumes. The calculation followed a standard formula adapted from BPS (2026). Total annual volume (Vt) was calculated by summing snake quantities (qi).

$$Vt = \sum_{i=1}^{n} qi$$

Description:

Vt : Total annual export volume of CITES Appendix II snakes
qi : Quantity of snake exports for species i
n : Total number of snake species included in the calculation
i : Index representing each individual snake species (i = 1, 2, ..., n)

Export Trend Analysis

A linear time series analysis was used to determine mid-term export trends and directions. This approach utilized a simple linear regression model to map data fluctuations. To ensure methodological validity, the analysis followed the standard statistical and linear regression framework outlined by Sugiyono (2013).

$$Y' = a + bX \quad \text{..... (1)}$$

$$a = \frac{(\Sigma Y)(\Sigma X^2) - (\Sigma X)(\Sigma XY)}{n\,\Sigma X^2 - (\Sigma X^2)} \quad \text{..... (2)}$$

$$b = \frac{n\,\Sigma XY - (\Sigma X)(\Sigma Y)}{n\,\Sigma X^2 - (\Sigma X^2)} \quad \text{..... (3)}$$

Description:

Y' : Export volume
X : Time factor (years)
a : Constant
b : Trend coefficient
R^2 : Coefficient of determination (goodness-of-fit measure)

Furthermore, the direction and reliability of the export trends are categorized based on both the regression coefficient (b) and the coefficient of determination (R^2). The trend is defined as increasing if $b > 0$, decreasing if $b < 0$, and stagnant if $b = 0$. Additionally, the R^2 value is utilized as a goodness-of-fit measure to assess trend reliability, classifying categories with low R^2 values as highly volatile or poor-fitting due to anomalous single-year spikes or sudden zero-outs.

Non-Tax State Revenue Contribution Analysis

To estimate the potential non-tax state revenue from legal snake exports rather than reflecting actual realized state receipts, calculations were based on Government Regulation No. 36/2024. This estimation process systematically incorporates annual export volumes and official tariff rates for each commodity. Specific source codes are integrated into the calculation to account for the origin of the specimens.

$$\text{Non-Tax State Revenue} = (Q \times T \times S) + F$$

Description:

Q : Quantity of exported snake commodities

T : Regulatory tariff rate per unit (benchmark price)
S : Percentage multiplier based on source code (Code W = 8%, Code C = 4%, Code F = 2% in accordance with Government Regulation No. 36/2024)
F : Fixed administrative service fee (IDR 50,000 per application document)

Management, Supervision, and Conservation Analysis

A qualitative descriptive analysis was used to synthesize trade data with interview outcomes. By using this framework, the study analyzes enforcement mechanisms and policy implementation within wildlife trade governance, corresponding to similar qualitative approaches used to evaluate constraints in wildlife protection laws (Hiola et al., 2026). Furthermore, it interprets the implementation of quota systems, physical verification, and policy enforcement elements that serve as key mechanisms for balancing economic utilization and ecological sustainability.

RESULT AND DISCUSSION

Volumes and Export Trends of CITES Appendix II Snake Commodities

The compiled quantitative data on Indonesia's snake trade are presented below. Table 1 details the export volumes and trend analysis of Appendix II snakes from 2020 to 2024. These figures highlight the shifting trajectory of each trade category over the five-year period.

Table 1. Export Volume & Trend Analysis of Appendix II Snakes from Indonesia (2020-2024)

Trade terms	Year					Trend coefficient	R^2	Trend status
	2020	2021	2022	2023	2024			
Garments (pcs)	48	14	8	3	0	Y = 46.7 - 10.7X	0.86	b < 0 (decreasing)
Gall bladders (kg)	520	343	270	125	0	Y = 629.28 - 125.87X	0.95	b < 0 (decreasing)
Meat (kg)	26,028	22,530	40,323	27,797	0	Y = 37,372.22 - 4,678.82X	0.31	b < 0 (decreasing)
Live (unit)	49,901	45,461	11,213	14,101	6,754	Y = 60,782.2 - 11,765.4X	0.75	b < 0 (decreasing)
Skin pieces (pcs)	5,000	1,334	1,799	713	244,739	Y = − 92,940 + 47,885.7X	0.31	b > 0 (increasing)
Leather products (pcs)	76,971	133,309	53,317	45,291	16,625	Y = 126,815.6 - 20,571X	0.70	b < 0 (decreasing)
Skins (pcs)	251,527	402,853	277,785	213,486	233,227	Y = 693,015.6 - 139,080X	0.49	b < 0 (decreasing)

Source: CITES Trade Database (2026), processed by the author.

Description:

Trade terms : Recorded CITES Appendix II snake trade commodity categories
b < 0 : Decreasing export trend status based on linear regression analysis
b > 0 : Increasing export trend status based on linear regression analysis
R^2 : Coefficient of determination indicating goodness-of-fit for export trends

A significant decline and sharp fluctuations occurred in secondary categories. For instance, the live snake category dropped drastically from 49,901 units in 2020 to 6,754 units in 2024, while the exports of meat, gallbladders, and garments continued to diminish until they were no longer recorded. Operational obstacles, such as strict environmental standards and high shipping costs, became major challenges in trading these commodities (Kwartama, 2023). Furthermore, strict restrictions on wild harvest quotas for Appendix II species drove the stagnation of these non-skin product exports. This shift highlights a transition from live animal trade to derivative products, showing a broader industry trend where the global luxury market optimizes supply

chains to mitigate regulatory friction and cater to high-end, specialized demand. A dynamic consistent with Hughes et al. (2022), who note that changes in CITES status often precede such strategic alterations in trade volume.

The skin pieces category exhibits a unique pattern that contrasts sharply with other commodities, characterized by stagnant volumes from 2020 to 2023 followed by a significant surge to 244,739 pieces in 2024. Although the linear regression suggests a positive trajectory, the low coefficient of determination ($R^2 = 0.316$) confirms a poor model fit, indicating that this growth is a single-year statistical anomaly rather than a gradual shift toward downstream processing. Internally, this drastic fluctuation is driven by Indonesia's strict compliance with CITES, where exports are controlled through annual quotas and transaction-specific SATS-LN (*Surat Angkut Tumbuhan dan Satwa Luar Negeri*) permits (Nurfadjri & Zahidi, 2024). Consequently, this jump reflects administrative dynamics, such as delayed quota realizations or sudden shifts in export clearance efficiency, rather than organic market expansion. Externally, reliance on the international luxury goods market makes these volumes highly sensitive to global regulatory changes and shifting dynamics. As Halim et al. (2025) note, while high-value reptile leather offers significant economic potential, the industry remains increasingly overshadowed by animal welfare dilemmas and volatile demand. Therefore, while the 2024 spike may reflect temporary strategic efforts to maximize export windows under stringent rules, it remains vulnerable to anomalies rather than forming a sustainable downstream trend.

In contrast, the skins category has consistently been the dominant export commodity in terms of volume, despite a general downward trajectory from 251,527 pieces in 2020 to 233,227 pieces in 2024. Trade in these skins remains highly responsive to international demand, allowing Indonesia's genuine leather creative industry to successfully penetrate competitive markets like Germany (Noviantoro, 2021). In addition, supply network analyses demonstrate that major East Asian hubs like China represent key target destinations and trade nodes for CITES-listed reptile products, further reinforcing how Asian market dynamics drive international trade flows (Wang et al., 2026). Nevertheless, growing preferences for alternative materials like vegan leather are forcing global brands to reevaluate their supply chains (Halim et al., 2025). Ultimately, the observed decline in the live animal trade and the corresponding dominance of processed products indicate the successful implementation of the quota system and increased regulatory oversight over specimens that pose a high risk to wild populations. Furthermore, this shift is closely linked to the development of captive breeding programs in Indonesia, which demonstrate a structural adaptation to strict international conservation standards. Shifting wildlife utilization toward value-added by-products and closed-loop breeding systems can enhance the traceability and regulation of specimens while simultaneously optimizing non-tax state revenue, provided that management strategies competently address biological feasibility and governance barriers (Meeks et al., 2024). This transition provides a strategic pathway for states to balance rigorous conservation goals with economic growth through a legal, transparent, and socially responsive wildlife trade framework.

Non-tax State Revenue Contributions from the Snake Export Sector

To evaluate the economic output of this trade sector, the potential national revenue has been compiled systematically. Table 2 details the total non-tax state revenue derived from Indonesia's Appendix II snake exports from 2020 to 2024. The tabulated values indicate the shifting financial trajectory across different commodity categories over the five-year period.

Table 2. Total Non-tax State Revenue of Appendix II Snakes from Indonesia (2020-2024)

Trade terms	Year					Total non-tax state revenue (IDR)
	2020	2021	2022	2023	2024	
Garments (IDR)	134,480	124,640	67,280	56,480	0	382,880
Gall bladders (IDR)	911,016	466,480	367,200	220,000	0	1,964,696
Meat (IDR)	45,839,280	39,802,800	71,168,480	49,137,408	0	205,947,968
Live (IDR)	79,620,960	83,292,720	22,932,600	33,795,420	13,298,280	232,939,980
Skin pieces (IDR)	6,850,000	2,981,440	4,028,240	1,590,080	471,186,240	486,636,000
Leather products (IDR)	158,481,120	275,160,740	109,982,200	87,674,820	30,994,800	662,293,680
Skins (IDR)	521,591,120	805,246,480	549,541,500	450,875,360	466,751,920	2,794,006,380

Source: Primary data analysis (2026), compiled from CITES Trade Database and calculated under applicable PNBP tariff regulations.

Description:

IDR : Indonesian Rupiah (currency unit)
Trade terms : Recorded CITES Appendix II snake trade commodity categories
PNBP : Non-tax state revenue derived from official export permit tariff fees

Indonesia's flagship exports have historically included blood python garments, reticulated python gallbladders, and Javanese cobra meat. However, these categories experienced zero export activity in 2024, leading to a complete loss of non-tax state revenue from these specific sectors. This cessation aligns with broader structural challenges and non-tariff barriers currently affecting Indonesian animal product exports. Administrative bottlenecks, such as strict compliance with annual CITES quotas and lengthy verification cycles, frequently disrupt continuous trade flows (Nurfadjri & Zahidi, 2024). Furthermore, adherence to rigorous quality assurance frameworks like HACCP has become a mandatory international prerequisite for managing biological risks (Mulyawati, 2024). Indonesian exporters often struggle to adapt to these evolving global biosafety standards and complex compliance certifications (Alsy et al., 2023). Ultimately, the inability of domestic sectors to reconcile these quality-compliance dynamics with restrictive quota timelines has suppressed downstream viability and shifted trade realization toward non-food commodities.

In stark contrast, the live animal trade sector continues to show resilient performance. This sector is consistently dominated by the genus Python, such as the blood python (*Python brongersmai*) and the Bornean blood python (*Python breitensteini*), which have successfully penetrated the international hobby markets in the United States (US) and Germany. The live animal market provides a stable contribution due to sustained demand from hobbyists and the strict application of animal welfare principles (Fuadiyyah et al., 2024). Ultimately, utilizing CITES source codes C (captive-bred) and F (farmed) serves as a vital strategy for live commodities to improve product quality, satisfy international sustainability standards, and ensure supply consistency, thereby maintaining global market competitiveness during periods of raw commodity stagnation. This strategic shift is further corroborated by research indicating that well-managed captive-breeding programs not only facilitate market access by meeting stringent international conservation standards but also provide a sustainable framework for economic returns, thereby serving as a robust alternative to wild-sourced offtake (Meeks et al., 2024). Addressing these compliance standards is particularly critical, as global trade reviews underscore Indonesia as one of the primary source countries for the international live pet market, where overharvesting and quota bypasses, such as in the trade of Morelia viridis and Python

brongersmai, continue to pose persistent sustainability risks if captive-breeding protocols are not strictly enforced (Aguayo et al., 2026).

This economic resilience became particularly evident when the meat category slumped. Conversely, exports of reticulated python skin pieces to the US and European markets peaked in 2024. To maintain competitiveness in this premium sector, ensuring material eligibility is crucial. The physical quality criteria for exotic leather export commodities, particularly the reticulated python (*Malayopython reticulatus*), are strictly evaluated based on the integrity of the tanned skin sheets. According to Mauliani and Siregar (2021), the export quality standards for reptile leather are systematically categorized into three distinct grading classes based on the presence of physical defects, such as the frequency of holes, the preservation of scale structures, and the overall structural smoothness post-tanning. Meeting these rigorous standards directly dictates the success of downstream utilization, where value-added leather products consistently dominated by the reticulated python (*Malayopython reticulatus*) can reach volumes of millions of units per year for small leather goods. Furthermore, the transition toward processed leather goods aligns with broader industry strategies to maximize economic returns through captive-bred systems, which offer a more consistent supply of high-quality materials that satisfy the stringent demands of international luxury markets (Meeks et al., 2024).

The strong concentration of finished leather product exports to France, the US, and Japan indicates that Indonesian commodities have successfully integrated into the global luxury supply chain. This aligns with Nurchaliza et al. (2023) regarding France's strategic position as the world's fashion capital, ensuring sustained demand for high-quality raw materials to meet the standards of exclusive brands. Although there is a risk of export dependence on a single species, data from 2023 and 2024 demonstrate a robust rebound. This resilience is supported by Faradina and Putri (2025), who state that demand for luxury goods is driven more by consumer perceptions of exclusivity and social status than by short-term economic shocks. Additionally, Sidiq (2025) notes that the US remains a strategic market, absorbing more than 40% of Indonesia's total handicraft exports. To ensure this wildlife utilization sector operates sustainably, supportive policy synergy is essential. As recommended by Chatra (2024), intervening in locally-based creative industries and strengthening production capacity through adaptive regulations, accessible capital, and technological support will optimize the long-term contribution of snake commodities to the state treasury.

The skins category constitutes the true backbone of the snake trade in Indonesia and serves as the largest, most consistent contributor to non-tax state revenue. This category is dominated almost entirely by the reticulated python (*Malayopython reticulatus*). Trade in these skins remains highly responsive to international demand. This steady supply chain has allowed Indonesia's genuine leather creative industry to successfully penetrate competitive markets like Germany (Noviantoro, 2021). Interviews with the Directorate of Species and Genetic Conservation confirm that this skins market is far more stable, mature, and deeply industrialized compared to live animals or meat. Exporters' partnerships with regular overseas fashion houses require a continuous supply of massive volumes, making this systemic trade mechanism highly dependent on quota accuracy and strict CITES compliance to safeguard state revenue. Analysis of ecological and life-history traits reveals that species involved in the skin trade generally exhibit larger body sizes, broader geographic distributions, and higher reproductive outputs compared to non-traded species, making them more resilient to harvest (Colston et al., 2026). While there are instances where compliance could be improved, the available evidence suggests that the international commercial trade in reptile skins is, for the most part, biologically sustainable and well-regulated. However, reinforcing transparency across the supply chain remains essential; synthesis of trade impacts reveals significant economic disparities, with local harvesters in origin countries like Indonesia receiving only a minimal fraction of the final market value compared to

destination importers, highlighting the need for equitable governance alongside biological sustainability (Aguayo et al., 2026).

Table 3. Destination Countries for Indonesian CITES Appendix II Snake Exports by Trade Category (2020-2024)

No	Trade terms	Main Markets (Top 5)
1	Garments	United Kingdom, United States, Japan
2	Gall bladders	Hong Kong
3	Meat	Hong Kong, Taiwan, China
4	Live	United States, Germany, China, Hong Kong, Japan
5	Skin pieces	United States, Hong Kong, Italy, Saudi Arabia, Singapore
6	Leather products	France, United States, Japan, Kyrgyzstan, Kazakhstan
7	Skins	Singapore, Mexico, Turkey, China, Italy

Source: CITES Trade Database (2026), processed by the author.

Description:

Trade terms : Recorded CITES Appendix II snake trade commodity categories
Main Markets : Top five destination countries ranked by total accumulated export volume from 2020 to 2024

Based on the destination analysis of CITES Appendix II snake trade records from 2020 to 2024, Indonesia's export markets exhibit distinct geographic specialization across commodity categories. Primary raw and semi-processed commodities such as skins and leather products are predominantly directed toward global fashion and luxury manufacturing hubs, including Singapore, Italy, France, and the United States. Conversely, derivative items and traditional consumption products, specifically meat and gall bladders, are heavily concentrated in Asian markets, with Hong Kong, Taiwan, and mainland China serving as the primary import destinations. Meanwhile, live specimens maintain a broader global market distribution, spanning major scientific, pet, and recreational markets across Europe, North America, and East Asia. The detailed export destination profiles for each commodity category are fully summarized in Table 3. This widespread distribution of live specimens is consistent with broader literature identifying Indonesia as a leading exporter, representing a notable proportion of global studies evaluating the ecological and economic footprints of the North American pet trade (Aguayo et al., 2026).

Trade Management, Monitoring, and Conservation Efforts

Wildlife trade management is carried out through a tiered monitoring system and strict specimen traceability, starting from physical inspections by the Natural Resources Conservation Agency (*Balai Konservasi Sumber Daya* Alam/BKSDA) to the utilization of the digital export permit system (e-SATS-LN) integrated with the Indonesia National Single Window (INSW). The implemented quota mechanism is categorized based on the origin of the wildlife. The wild-capture quota is determined based on scientific recommendations from the National Research and Innovation Agency (*Badan Riset dan Inovasi Nasional*/BRIN), whereas the quota for captive-bred wildlife is regulated through the Maximum Utilization Limit (*Batas Pemanfaatan Maksimum*/BMP), established following a sustainability audit (interview with a functional officer at the Directorate of Species and Genetic Conservation, January 2026).

Sustainable wildlife utilization can provide economic benefits while supporting conservation objectives, provided that management practices balance economic and ecological factors within established frameworks, such as CITES and national conservation laws (Marianah et al., 2025). Furthermore, trade supervision is strengthened through rigorous verification and inspection processes to prevent laundering practices. While the overarching legal foundation for the conservation of living natural resources and their ecosystems is established by Law No. 5 of 1990 as recently amended by Law No. 32 of 2024, the technical operational procedures and non-tax

state revenue tariff structures for commercial wildlife utilization are specifically governed by Ministry of Environment and Forestry Regulation No. 18/2024. According to an interview conducted in 2026 with a Directorate of Species and Genetic Conservation official, this regulation mandates restocking for pure-bred specimens and provides an alternative financial scheme for conservation when direct reintroduction is ecologically unfeasible

From an economic perspective, the skins category contributes significantly to non-tax state revenue due to stable market demand. However, the implementation of the single-basket system causes these revenue funds to enter the state treasury first. Consequently, the reallocation for conservation activities remains dependent on the annual budget mechanism through the Budget Implementation List (DIPA).

CONCLUSION AND RECOMMENDATION

Snake skins have consistently emerged as Indonesia's primary exported snake commodity. The expanding export trend of snake skin pieces indicates a significant structural shift in international trade, moving away from live animals toward value-added derivative products. Due to its substantial volume and stable international market support, the skins category has become the backbone of state revenues from this sector, generating a total non-tax state revenue of IDR 2,794,006,380.00. From a management perspective, the integration of trade systems has enhanced the traceability and transparency of the trade chain. By providing a digital audit trail, this mechanism serves as a crucial infrastructure that facilitates the monitoring and reduction of potential laundering risks. However, it should be noted that the current reallocation framework of non-tax state revenue remains insufficiently stable to optimally support domestic conservation efforts. To ensure the long-term sustainability of the wildlife trade sector, an in-depth ecological study regarding the effectiveness of restocking programs in natural habitats is urgently required. These localized conservation measures must be strategically balanced with tactical mitigation actions against non-tariff barriers in the global market to maintain the economic stability of industry stakeholders. Finally, to secure the regulatory future of this trade, a comprehensive assessment of long-term economic impacts is necessary. This assessment serves as a preventive measure to anticipate and mitigate the potential uplisting of snake species from CITES Appendix II into the more restrictive Appendix I list.

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