

From Commodity to Product: A Secondary Data Analysis of Value-Added Gaps in Coconut Agribusiness in Gorontalo, Indonesia and Thailand

Kalzum R Jumiyanthi^{1*}, Barmin R Yusuf², Deffrinica³, Rais Dera Pua Rawi⁴,
Houria Ben Gharbi⁵

^{1,2} Department of Development Economics, Universitas Gorontalo, Indonesia

³ Department of Management, Shanti Bhuana Institute, Indonesia

⁴ Master's Program in Management, Muhammadiyah University of Sorong, Indonesia

⁵ Department of Economics, Emir Abd El Kader University, Algeria

*Corresponding Author: yanti.kalzum@gmail.com

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Abstract : Indonesia is the world's largest coconut producer, contributing 27.5 percent of global output, yet earns lower coconut export revenues than Thailand, which produces only 1.09 percent. This paradox reflects a structural value-added gap rooted in different agribusiness orientations: Indonesia remains trapped in a copra commodity orientation, while Thailand has developed a high-value processed-product orientation. Methodologically, this study uses a comparative secondary-data analysis within the Global Value Chain (GVC) governance framework to characterize each region's value chain position, combined with the Hayami value-added method to quantify and compare value-added multipliers. The gap is operationalized as the difference in value-added multipliers and average export unit values between Gorontalo, Indonesia, and Thailand, using harmonized official data from FAO, WITS/UN Comtrade, BPS Gorontalo, and Scopus-indexed literature. Three findings emerge. First, Indonesia's average export price (USD 318 per tonne) is less than half of Thailand's (USD 694); the value-added multiplier for copra in Gorontalo ranges from 4 to 10 times, while processed products reach up to 35 times. Second, Gorontalo operates under market-type governance with farmers as price-takers, whereas Thailand has advanced towards modular-relational governance through integrated processing and export clusters. Third, the volatility of the Farmer Terms of Trade for Plantation Smallholders (NTPR), fluctuating between 142.40 and 158.98 within a single year, evidences structural dependence on global commodity price cycles. This study offers the first explicitly comparative, secondary-data value-added gap analysis between an Indonesian coconut region and Thailand, with policy implications for subnational commodity-to-product transformation.

Keywords : coconut agribusiness, global value chain, Gorontalo, value-added gap, commodity trap, Thailand, smallholder welfare

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INTRODUCTION

Coconut (*Cocos nucifera* L.) is one of the most strategically important plantation commodities in tropical agricultural economies, particularly across Southeast Asia. Indonesia ranks as the world's largest coconut producer, with total output reaching 17,190,328 tonnes in 2022, equivalent to 27.5 percent of global production of 62,409,431 tonnes (FAO, 2024). This production advantage positions Indonesia well ahead of the



Philippines (14,931,158 tonnes) and India (13,317,000 tonnes), its two closest competitors. However, behind this remarkable production dominance lies a striking paradox: Indonesia still lags behind Thailand in export value, despite Thailand producing only 679,232 tonnes—ranking tenth globally (FAO, 2024). In 2023, Thailand exported fresh coconuts valued at USD 453.65 million from 653,191 tonnes, making it the world's leading fresh coconut exporter with a 48 percent share of global export value. By contrast, Indonesia earned only USD 277.4 million from fresh coconut exports despite shipping a substantially larger volume of 871 million kilograms (UN Comtrade, 2023). This paradox shows that production scale alone cannot guarantee competitive advantage within global value chains; instead, it reveals a fundamental value-added gap.

At the subnational level, Gorontalo Province represents one of the most important coconut-producing centers in eastern Indonesia. Data from BPS Gorontalo (2025a) indicate that the area under smallholder coconut cultivation in Gorontalo reaches 70,100 hectares, with total production of 66,100 tonnes (preliminary 2025 figures), making coconut by far the most extensively cultivated plantation commodity in the province — substantially surpassing cocoa (12,800 ha; 1,500 tonnes) and oil palm (5,200 ha; 4,200 tonnes). A field-based study in Gorontalo by Roring et al. (2023) confirms that despite the province's 73,700 hectares of coconut land, virtually all output still takes the form of copra—the most basic processed product with minimal value addition. This condition indicates that coconut agribusiness in Gorontalo remains trapped in a commodity mindset, in which farmers occupy the lowest rung of the value chain as price-takers, wholly dependent on international commodity price fluctuations beyond their control (Wahyudi et al., 2025).

This dependence on raw commodities directly and measurably affects the economic welfare of coconut farmers in Gorontalo. The Farmer Terms of Trade for Plantation Smallholders (NTPR) — an index reflecting the purchasing power of smallholder plantation farmers — displays high volatility: from 143.05 in January 2025, it surged to 149.16 in February 2025 (up 4.27 percent, driven by rising coconut prices), climbed further to 158.98 in May 2025 (up 7.58 percent, again propelled by coconut and cocoa price increases), before falling back to 143.59 in January 2026 (BPS Gorontalo, 2025b, 2025c, 2026). This swing of more than 15 index points within a single cycle constitutes empirical evidence that farm income in Gorontalo is highly exposed to global commodity price movements rather than being supported by value added created through product processing. Furthermore, Aminda et al. (2024) found that poverty, the Human Development Index (HDI), and unemployment remain significant structural challenges across Gorontalo Province's regencies and municipalities over 2012–2021, partly attributable to the low diversification of the agricultural economy. These conditions are reinforced by Tolinggi et al. (2023), who highlight farmer regeneration failures and the limited knowledge transfer in Gorontalo's coconut agribusiness, both of which obstruct the transition from primary production to high-value processing.

Thailand, by contrast, follows an entirely different trajectory. Although not among the world's leading coconut producers — ranking only tenth globally — Thailand has built a strong competitive advantage through a high-value processed-product orientation. In 2023, Thailand became the world's largest coconut water exporter, with export revenues of USD 519.9 million and a global market share of 14.69 percent. Thai coconut milk exports for January–October 2024 reached USD 341.11 million, a year-on-year increase of 16.85 percent from the same period in 2023 (Thailand Ministry of Commerce, 2024).

Consequently, Thailand's average coconut export price stands at USD 694 per tonne — more than twice Indonesia's equivalent figure. This striking disparity reflects a fundamentally different value chain structure: Thailand has developed a coconut-processed-products cluster supported by coherent industrial policy, access to processing technology, and integration into the Global Value Chain (GVC) as a value-adding node rather than a mere raw material supplier. Ørtenblad et al. (2023) and Moreno et al. (2020) confirm that modernizing agri-food value chains in Thailand, including agricultural commodities, has generated significant positive effects on farm incomes through enhanced processing capacity and access to export markets.

Several prior studies have examined specific aspects of the value-added problem in Indonesian coconut agribusiness. Mardesci et al. (2021) demonstrated quantitatively that processing coconut water into derived products yields substantially higher value added than copra, with coconut-water-based candy generating the highest value added of IDR 69,980.8 per kilogram. Desrial et al. (2025) showed that the coconut sugar industry in Indragiri Hilir can generate value added of IDR 2,794–3,318 per liter of coconut sap under smallholder production arrangements. Alouw & Wulandari (2020) and Wulandari & Alouw (2021) emphasize that the core problem of Indonesian coconut agribusiness lies not in production, but in the absence of viable agro-industrial business models at the village level. Mardesci et al. (2019) emphasize that the core problem of Indonesian coconut agribusiness lies not in production, but in the absence of viable agro-industrial business models at the village level. Nasution et al. (2024) examined barriers to coconut plantation revitalization in Aceh, while Vaulina et al. (2024) investigated the relationship between land characteristics and the sustainability of coconut cultivation in Indonesia. In the supply chain dimension, Wahyudi et al. (2025) analyzed coconut supply chains in remote areas of Riau through a sustainability lens. Zakaria (2023) conducted a systematic review of global coconut value chains, and Ramírez et al. (2023) mapped innovation trends across the coconut agro-industrial supply chain. Nevertheless, a comparative study that explicitly positions Gorontalo as a representative Indonesian coconut-producing region with a copra orientation—vis-à-vis Thailand as a processed-product-oriented country—within a single integrated GVC analytical framework remains notably absent from the literature.

The research gap underlying this study spans three dimensions. Thematically, no study has specifically compared the coconut value-added gap between Gorontalo as a copra-producing region and Thailand as a processed-product-oriented country within a single integrated analytical framework. Methodologically, most prior studies rely on small-scale primary field data that cannot capture macro-comparative cross-country patterns. This study addresses that gap through a desk-based comparative analysis drawing on official secondary data from FAO, UN Comtrade, BPS, and Scopus-indexed literature, enabling systematic and replicable cross-national comparisons. Theoretically, this study operationalizes the GVC governance framework of Gereffi et al. (2005)—which distinguishes five types of value chain governance from *market* to *hierarchy*—to explain why differences in value chain positioning generate significant disparities in the distribution of value added to farming communities. The novelty of this research lies in presenting the first explicitly comparative, secondary-data-based analysis that measures the value-added gap in coconut commodity agribusiness at the subnational level (Gorontalo) vis-à-vis the national level (Thailand), with policy implications directly targeted at structural transformation of the regional agribusiness sector.

Building on the foregoing, this study addresses three research questions: how large is the coconut agribusiness value-added gap between Gorontalo and Thailand based on available secondary data; how do differences in coconut value chain governance between the two regions affect farmers' positions within the GVC; and what policy implications can be recommended to Gorontalo to drive the transformation from a commodity to a product orientation? Accordingly, the study pursues three objectives: to analyze and document the coconut value-added gap between Gorontalo and Thailand; to identify differences in coconut value chain governance between the two regions using the GVC framework; and to formulate evidence-based policy recommendations to transform Gorontalo's coconut agribusiness. The findings are intended to contribute to coconut product diversification policy formulation in Gorontalo and other coconut-producing regions in Indonesia, while also providing an academic reference for value chain research on tropical commodities in developing countries.

RESEARCH METHODS

This study employs a *desk-based comparative* approach using qualitative, descriptive secondary data analysis. This design was selected for three reasons: all available data are official secondary data; the research objectives are macro-comparative and cross-national; and comparative value chain studies grounded in official secondary data are well established in the agricultural economics literature, provided a robust methodological justification is offered. The research design follows the comparative agribusiness systems analytical framework of Kaplinsky & Morris (2000) and Gereffi et al. (2005), both of which affirm that value chain analysis can be conducted validly through the triangulation of complementary secondary data sources.

Data were drawn from five principal categories: (1) FAO FAOSTAT — global coconut production data for 2022; (2) UN Comtrade/World Bank WITS — export values and volumes for fresh coconut, coconut water, and coconut milk for Indonesia and Thailand covering 2022–2023; (3) BPS Gorontalo Province — coconut plantation area and production data, and the Farmer Terms of Trade for Plantation Smallholders (NTPR) for the period 2023–2026; (4) Scopus-indexed literature — value-added data for processed coconut products in Indonesia; and (5) Thailand Ministry of Commerce — export values for Thai processed coconut products for 2023–2024. The primary temporal coverage spans 2020–2025, with each source referencing the most recently available year.

Table 1. Research data sources

No.	Data Source	Information Obtained	Year	Research Objective
1	FAO – FAOSTAT	Global coconut production; world producer rankings	2022	Objectives 1 & 2
2	UN Comtrade / WITS World Bank	Export value and volume of fresh coconut, coconut water, and coconut milk for Indonesia and Thailand	2022–2023	Objectives 1 & 2
3	BPS Gorontalo Province	Coconut plantation area and production; Farmer Terms of Trade	2023–2026	Objectives 1 & 3

No.	Data Source	Information Obtained	Year	Research Objective
		(NTP and NTPR) 2023–2026		
4	Scopus-indexed literature	Value added of processed coconut products in Indonesia; Gorontalo agribusiness conditions	2018–2025	Objectives 1 & 2
5	Thailand Ministry of Commerce	Thai processed coconut product export values	2023–2024	Objectives 1 & 2

Sources: Authors' own elaboration.

The Global Value Chain (GVC) framework of Gereffi et al. (2005) serves as the primary analytical foundation. This framework identifies five types of value chain governance—from market to hierarchy—each determining how value is distributed among chain actors. In this study, Gorontalo is positioned within a market-type governance structure (farmers sell copra without product differentiation). In contrast, Thailand has advanced toward modular–relational governance through the development of high-value processed products. The framework of Kaplinsky & Morris (2000) is employed as a complementary lens to analyze value-added distribution from the primary production stage through to final distribution.

Three analytical methods are applied, each corresponding to one of the study's three objectives.

Value-Added Gap Analysis (Objective 1)

This study adapts the Hayami value-added method to calculate the Value-Added Multiplier (VAM) and Value-Added Gap (VAG) for coconut products in Gorontalo and Thailand. The principal formulas applied are as follows:

$$NT = NP - HBB - IBTP \quad (1)$$

$$RVA(\%) = \frac{NT}{NP} \times 100 \quad (2)$$

$$VAM = \frac{\text{Processed Product Price}}{\text{Raw Material Price}} \quad (3)$$

$$VAG = VAM_{Thailand} - VAM_{Gorontalo} \quad (4)$$

where NT = value added (IDR/kg or USD/tonne); NP = value of the processed product; HBB = raw material price; IBTP = intermediate input costs. Rupiah-denominated prices are converted to USD using Bank Indonesia's average reference exchange rate for 2023 (IDR 15,200/USD).

The sequence of the Hayami value-added calculation — from value added (NT) to the relative value-added ratio (RVA), the value-added multiplier (VAM), and finally the cross-region value-added gap (VAG) — is summarised in Figure 1.

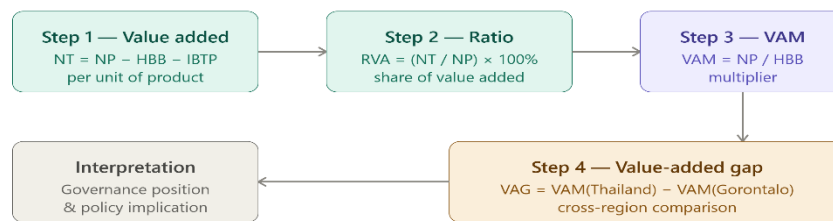


Figure 1. Flow of the Hayami value-added calculation

Source: Authors' own elaboration.

GVC Governance Analysis (Objective 2)

A qualitative-comparative analysis is conducted through systematic document analysis of Scopus-indexed literature, applying an analytical matrix covering five dimensions: value chain structure, GVC governance type, degree of product upgrading, value-added distribution, and the role of government policy.

Policy Implication Analysis (Objective 3)

Policy implications are formulated through a normative-analytical approach based on the synthesized findings from Objectives 1 and 2, drawing on GVC upgrading strategies (Gereffi et al., 2005) and policy recommendations from the Indonesian coconut agro-industrial literature. Thailand's agribusiness development model is used as a benchmark for formulating contextually appropriate structural transformation recommendations for Gorontalo.

Data collection was conducted in three stages: (1) retrieval of global production and export data from FAO FAOSTAT (fao.org/faostat) and UN Comtrade Plus (comtradeplus.un.org) using HS Code 0801; (2) downloading official data from BPS Gorontalo Province, including the Official Statistical Report on Farmer Terms of Trade and plantation data; and (3) a Scopus literature search using the keyword combinations "coconut value chain", "Gorontalo coconut", "coconut value added", and "Thailand coconut export". Because this study integrates datasets originating from different institutions, temporal coverages, and reporting units, four explicit procedures were applied to ensure analytical comparability. First, regarding data selection criteria, datasets were included only if they satisfied three conditions: (a) being issued by an official statistical authority (FAO, UN Comtrade/WITS, BPS, or the Thailand Ministry of Commerce) or published in a Scopus-indexed source; (b) referencing coconut (HS Code 0801) or its directly derived products; and (c) representing the most recently available year within the 2020–2025 window. Where multiple sources reported the same indicator, official primary statistics were prioritized over secondary estimates. Second, for unit standardization, trade values were standardized to USD per tonne to enable cross-national comparison, and reported volumes were converted to a common tonne basis. Domestic Indonesian prices expressed in IDR were converted to USD using Bank Indonesia's 2023 average reference rate (IDR 15,200/USD)—the same reference year as the Thai export data—to avoid exchange-rate distortion across periods. Third, concerning the treatment of temporal inconsistency, because FAO production data (2022), UN Comtrade export data (2023), and BPS NTPR data (2025–2026) do not share an identical reference year, each indicator is reported with its explicit source year and is not interpolated across years; cross-national

comparisons of export unit value rely on the common 2023 reference year for both Indonesia and Thailand. Time-sensitive indicators such as the NTPR and copra prices are presented as time series rather than single-point values, so that price volatility is treated as a substantive finding rather than smoothed away. Fourth, as a comparability safeguard, value-added data for processed products—unavailable for Gorontalo—were drawn from Indragiri Hilir (Riau) as an explicitly disclosed proxy, justified because both are smallholder copra-producing regions cultivating identical *Cocos nucifera* L. varieties under similar production arrangements; this proxy use follows the secondary-data triangulation approach of Kaplinsky and Morris (2000). We further ensured consistency and accuracy by cross-checking official primary sources against peer-reviewed literature. The asymmetry between a subnational Indonesian unit (Gorontalo) and a national Thai benchmark is acknowledged as a structural limitation and is addressed explicitly in the interpretation of results. This study is subject to limitations inherent to secondary data use, principally its inability to capture farm-level dynamics at the household scale; primary data collection in future research is strongly recommended.

RESULTS AND DISCUSSION

Production and Export Gap: The Paradox of the World's Largest Producer

The first finding from this secondary data analysis confirms the fundamental paradox that motivates this research: Indonesia, as the world's largest coconut producer with output of 17,190,328 tonnes in 2022 — equivalent to 27.5 percent of total global production of 62,409,431 tonnes (FAO, 2024) — nevertheless achieves lower export revenues than Thailand, which produces only 679,232 tonnes or 1.09 percent of global output. Coconut export data for 2023 show that Thailand recorded fresh coconut export revenues of USD 453.65 million from 653,191 tonnes. In contrast, Indonesia earned only USD 277.4 million despite shipping a substantially larger volume of 871 million kilograms (UN Comtrade, 2023). Table 2 presents this comparison.

Table 2. Comparative positions of Indonesia and Thailand in the global coconut value chain (2022–2023)

Indicator	Indonesia	Thailand
Coconut production (2022)	17,190,328 tonnes (1 globally; 27.5%)	679,232 tonnes (10 globally; 1.09%)
Fresh coconut export value (2023)	USD 277.4 million	USD 453.65 million (1 globally)
Fresh coconut export volume (2023)	871 million kg	653,191 tonnes
Average export price (2023)	~USD 318/tonne	USD 694/tonne
Coconut water export value (2023)	Lower	USD 519.9 million (1 globally; 14.69%)
Coconut milk export value (Jan–Oct 2024)	Limited data available	USD 341.11 million (+16.85% YoY)
Share of global fresh coconut export value	High volume, low unit value	~48% of global export value
Principal export products	Copra, crude coconut oil, fresh coconut	Packaged coconut water, coconut milk, premium fresh coconut

Sources: FAO (2024); Thailand Ministry of Commerce (2024); UN Comtrade (2023); Authors' own elaboration.

Table 2 reveals a highly significant value disparity: Thailand's average coconut export price of USD 694 per tonne is more than twice Indonesia's equivalent of approximately USD 318 per tonne. This unit price gap is attributable not to differences in raw material quality, but to differences in the degree of product processing. Thailand exports high-value processed products—packaged coconut water, sterilized coconut milk, and premium fresh coconuts meeting export quality standards—while Indonesia remains dominated by raw material and basic processed product exports. This finding aligns with Gereffi et al. (2005), who argue that an actor's position within the global value chain—not its production scale—determines the extent of value added it can capture. Zainol et al. (2023), in their systematic review, likewise confirm that coconut-producing countries that migrate to the midstream and downstream segments of the value chain consistently achieve higher export revenues per unit of raw material.

Gorontalo Coconut Agribusiness Profile: Copra Dominance and the Commodity Trap

At the subnational level, Gorontalo's coconut agribusiness profile reflects the structural problems characteristic of Indonesian coconut production as a whole. Data from BPS Gorontalo (2025a) show that the area under smallholder coconut cultivation in Gorontalo reaches 70,100 hectares — making coconut by far the most extensively cultivated smallholder plantation commodity in the province, substantially surpassing cocoa (12,800 ha), oil palm (5,200 ha), nutmeg (3,000 ha), and cashew (2,600 ha). Total coconut production in Gorontalo reaches 66,100 tonnes (preliminary 2025 figures), yielding an average productivity of 0.94 tonnes per hectare — a figure indicating considerable scope for further productivity improvement (BPS Gorontalo, 2025a).

More critical than the productivity issue, however, is the product orientation problem. Roring et al. (2023), in a field-based qualitative study in Gorontalo, confirm that of the province's 73,700 hectares of coconut land, virtually all output still takes the form of copra—the most basic processed product with minimal value addition. The study found that product innovations such as coconut shell briquettes—commonly produced in Bali and West Java—are virtually unknown in Gorontalo, even though every part of the coconut fruit can be processed into a high-value product. This situation leaves Gorontalo's coconut farmers economically vulnerable: as price-takers in the global commodity market, they cannot influence the prices they receive.

These conditions are reinforced by Wahyudi et al. (2025) on coconut supply chains in remote areas of Indonesia, which show that supply chain fragmentation, infrastructure constraints, and limited processing technology capacity constitute the primary structural barriers for coconut farmers in peripheral regions. Alouw & Wulandari (2020) note that although Indonesia is the world's largest coconut producer, the domestic processing rate falls far short of its potential because most farmers are smallholders without access to modern processing technology. Wulandari & Alouw (2021) further identify the absence of viable agro-industrial business models at the village level as the primary barrier to the transition from copra to high-value products. Tolinggi et al. (2023), in a study specifically focused on Gorontalo, found that the low rate of farmer regeneration and the limited knowledge co-creation in coconut agribusiness further compound product innovation stagnation in the region.

Value Added of Processed Coconut Products

Direct farm-gate copra price data for Gorontalo are available from two publicly verifiable secondary sources: (1) BPS Gorontalo Province NTPR reports, which embed copra price indices; and (2) media-reported field prices from Gorontalo Post, cross-validated against BPS Gorontalo commodity data. Where Gorontalo-specific processed product value-added data are unavailable — because virtually no such processing exists in the province (Roring et al., 2023) — this study uses data from Indragiri Hilir, Riau, which is methodologically appropriate because: (a) both regions are primary coconut-producing areas dominated by smallholder copra production; (b) both use identical *Cocos nucifera* L. varieties; and (c) the use of Indragiri Hilir data is explicitly disclosed as a proxy, following the triangulation approach endorsed by Kaplinsky & Morris (2000) for secondary data value chain analysis.

The following revised table incorporates Gorontalo-specific copra price data across three benchmark years (2022, 2023, and May 2025 peak), drawn from BPS Gorontalo NTPR reports and Gorontalo Post field price monitoring, and applies the full Hayami formula: $NT = NP - HBB - IBTP$.

Table 3. Comparison of Value-Added Multipliers (VAM) for Indonesian and Thai coconut products

Product	Region	Value Added NT & Ratio	VAM
Copra (2022)	Gorontalo	IDR 4,600/kg (65.7%)	4.4×
Copra (2023)	Gorontalo	IDR 6,800/kg (71.6%)	5.3×
Copra (peak May 2025)	Gorontalo	IDR 18,700/kg (85.0%)	10.0×
Copra baseline (avg. 2022–2025)	Gorontalo	IDR 7,900/kg (73.5%)	5.7×
Nata de coco	Indragiri Hilir	IDR 960/kg (19.2%)	~5×
Coconut sugar	Indragiri Hilir	IDR 3,318/litre (85.4%)	~6×
Coconut candy	Indragiri Hilir	IDR 69,981/kg (99.7%)	~35× (highest)
Coconut water syrup	Indragiri Hilir	IDR 23,674/kg (99.2%)	~12×
Fresh coconut — premium export	Thailand	USD 444–494/tonne (64–71%)	~4×
Packaged coconut water (export)	Thailand	USD 413–463/tonne (~63%)	~11×
Coconut milk (export, Jan–Oct 2024)	Thailand	USD 300–350/tonne (~57%)	~8–10×
Value-Added Gap (VAG) — Gorontalo vs Thailand		Max. VAG: $35 - 5.7 = 29.3$ pts (vs coconut candy)	Illustrative differential: ~USD 327 M/year (indicative)

Note: Value added (NT) is computed as $NT = NP - HBB - IBTP$, where NP = product price, HBB = raw-material price, IBTP = input cost. Underlying prices (per kg/litre/tonne): Gorontalo copra NP = IDR 7,000 (2022), 9,500 (2023), 22,000 (2025 peak); HBB = IDR 1,600–2,200; IBTP = IDR 800–1,100. Processed products (Indragiri Hilir): coconut-water raw material ≈ IDR 200/kg. Thailand: raw material USD 150–200/tonne; IBTP USD 50–80/tonne. USD conversion: IDR 15,200/USD (Bank Indonesia 2023 average).

Sources: Gorontalo: BPS Gorontalo (2025b, 2025c, 2026). Indonesia proxy: Desrial et al. (2025); Mardesci et al. (2021) — Indragiri Hilir, Riau; methodologically comparable as both are smallholder copra-producing regions with identical Cocos nucifera L. varieties. Thailand: FAO (2024); Thailand Ministry of Commerce (2024); UN Comtrade (2023). VAM values for processed products are estimates derived from available secondary data; Gorontalo copra VAM values are calculated from verified field price data.

Based on data in Table 3, the Value-Added Gap (VAG) is recalculated using the three-year average VAM for Gorontalo copra ($5.7\times$, representing the midpoint of the verified $4.4\text{--}10.0\times$ range across 2022–2025) as the baseline. The VAG between Gorontalo copra and Thailand's packaged coconut water is $11 - 5.7 = 5.3$ VAM points. The gap widens to 29.3 VAM points when compared against coconut candy ($\text{VAM} \sim 35\times$), the highest-value processed product identified in the comparable Indonesian literature (Mardesci et al., 2021). Against coconut water syrup, the VAG reaches 6.3 VAM points. These figures indicate that, with the same volume of raw material, product-oriented agribusiness actors can generate between two and six times the economic value achieved by copra-oriented counterparts. This value-added disparity can be interpreted through GVC upgrading theory (Humphrey & Schmitz, 2002), which distinguishes product upgrading (moving into more sophisticated product lines) from functional upgrading (capturing higher-value chain functions such as processing, branding, and distribution). The Gorontalo–Thailand gap reflects the absence of both trajectories: Gorontalo actors remain confined to a single low-complexity product (copra), whereas Thai actors have captured processing and distribution functions that command higher unit values. In value-capture terms, the multiplier gap represents value created within the chain but appropriated at downstream nodes outside the producing region—consistent with Kaplinsky & Morris (2000), who argue that functional and product upgrading are prerequisites for increasing value capture by producers in developing countries.

At the macro level, the per-tonne export price gap of USD 376/tonne (Thailand USD 694 vs Indonesia USD 318), applied to Indonesia's export volume of 871,000 tonnes, yields an illustrative value differential of approximately USD 327 million per year. This figure should be read as an indicative order-of-magnitude estimate rather than a literal, realizable economic loss: it abstracts from the substantial investments in processing capacity, technology, export-standard certification, and logistics infrastructure required to convert raw-material volumes into higher-value products, and it assumes that Indonesian processed exports could be absorbed at Thai unit values. The differential therefore illustrates the scale of value left uncaptured under the prevailing commodity orientation, while its realization remains contingent on the structural conditions discussed below. Understood in this way, the low value capture observed in Gorontalo is best explained not by a single "commodity trap" but by several mutually reinforcing constraints — limited processing investment, gaps in export-standard compliance, weak market access, and infrastructure and logistics bottlenecks — for which the commodity orientation is the most visible symptom rather than the sole cause.

The Impact of the Commodity Orientation on the Welfare of Coconut Farmers in Gorontalo

The tangible impact of the commodity orientation on the economic welfare of coconut farmers in Gorontalo is clearly reflected in the Farmer Terms of Trade for Plantation Smallholders (NTPR) data. BPS Gorontalo data for January 2025 to February 2026 reveal pronounced volatility, as shown in Table 4.



Table 4. Farmer Terms of Trade for Plantation Smallholders (NTPR) in Gorontalo, January 2025 – February 2026

Period	NTPR	Change (%)	Notes / Primary Driver
January 2025	143.05	—	Baseline, start of 2025
February 2025	149.16	+4.27%	Rising coconut and cocoa prices
March 2025	~154 (est.)	Increasing	Continued copra price uptrend
April 2025	147.78	Declining	Commodity price correction
May 2025	158.98	+7.58%	Cycle peak — driven by rising coconut and cocoa prices (BPS Gorontalo, 2025b)
January 2026	143.59	Sharp decline	Weakening copra prices
February 2026	142.40	-0.83%	Continued commodity price pressure

Sources: BPS Gorontalo (2025b, 2025c, 2026); Authors' own elaboration.

Table 4 illustrates the dramatic volatility of the NTPR: from 143.05 in January 2025, it surged to 158.98 in May 2025 (a rise of 15.93 points, or 11.1 percent, in five months), before falling back to 142.40 in February 2026 (a decline of 16.58 points over the subsequent eight months). This *boom-and-bust* pattern is characteristic of an economy dependent on primary commodities and therefore exposed to global price cycles. Crucially, the NTPR increases do not reflect greater value added created by farmers themselves; they merely reflect temporary global copra price increases. BPS Gorontalo (2025c) explicitly notes that the NTPR increases in the plantation smallholder subsector in February and May 2025 were caused by rising plantation crop price indices, *specifically in the coconut commodity* — not by any improvement in product value. This differs fundamentally from the Thai model, where farm income stability rests on processed product value that is more resilient to raw material price fluctuations.

These conditions are linked to broader structural economic problems in Gorontalo. Aminda et al. (2024) found that poverty, low HDI scores, and high unemployment across Gorontalo's regencies and municipalities during 2012–2021 are significantly associated with conditions in the agricultural sector, where the dominance of unprocessed primary commodities constrains inclusive economic growth. Nasution et al. (2024), in a broader Indonesian context, similarly found that barriers to coconut plantation revitalization are not purely technical-agronomic but also encompass complex socioeconomic dimensions, including capital constraints, limited market access, and farmers' low entrepreneurial orientation toward processed products.

Value Chain Governance Analysis: Gorontalo versus Thailand in the GVC Framework

The GVC governance framework of Gereffi et al. (2005) classifies value chains from market (arm's-length price transactions) to hierarchy (full vertical integration). Prior applications of this framework to coconut agribusiness have been descriptive, assigning governance types without measurable criteria. This study responds by operationalizing six GVC dimensions, each with a concrete and verifiable indicator, to produce a composite Governance Advancement Index (GAI) scored 1–5 per region. This approach follows the analytical matrix methodology applied in systematic coconut value chain reviews (Zainol et al., 2023) and extends it with quantifiable metrics. The GAI is constructed in three steps.

First (dimension scoring), each of the six governance dimensions is scored on a 1–5 ordinal scale, where 1 denotes the market-governance pole (arm's-length, price-driven transactions) and 5 the hierarchy pole (full vertical integration and high-value functional control); each score is anchored to the concrete, verifiable indicator listed in the corresponding row of Table 5, so that scoring is criterion-referenced rather than impressionistic. Second (weighting), the six dimensions are assigned equal weights, reflecting the absence of a theoretical or empirical basis for privileging any single dimension; this equal-weighting assumption is stated explicitly as a methodological choice, and sensitivity to alternative weightings is identified as a direction for future research. Third (aggregation), the composite GAI is computed as the arithmetic mean of the six dimension scores. For Gorontalo, the dimension scores (1.0, 1.0, 1.0, 1.0, 2.5, 2.5) sum to 9.0 and yield a mean of 1.5; for Thailand, the scores (4.0, 3.5, 4.0, 3.5, 3.0, 5.0) sum to 23.0 and yield a mean of 3.83, rounded to 3.8. The GAI is intended as a heuristic comparative device rather than a validated psychometric scale: its purpose is to render the qualitative governance comparison transparent and replicable, and results are therefore interpreted in ordinal terms (Gorontalo = market-type; Thailand = modular-relational) rather than as cardinal measurements.

Table 5. Operationalized GVC Governance Comparative Matrix: Gorontalo Versus Thailand

GVC Dimension	Gorontalo (score 1-5)	Thailand (score 1-5)
1. Value Chain Structure	~0% processed → 1.0	~62% processed → 4.0
2. GVC Governance Type	Market; spot sales → 1.0	Modular-relational; GMP/HACCP → 3.5
3. Product Upgrading	1 category (copra) → 1.0	≥4 categories → 4.0
4. Functional Upgrading	Production only (1/4) → 1.0	Production+processing+marketing (3-4/4) → 3.5
5. Value-Added Distribution	Farmer share ~14–20% → 2.5	Farmer share ~30–40% → 3.0
6. Government Policy Role	2 instruments → 2.5	≥5 instruments → 5.0
Composite GAI (mean)	1.5 / 5.0 (market-type)	3.8 / 5.0 (modular-relational)

Note: Scores on a 1–5 ordinal scale (1 = market pole; 5 = hierarchy pole); GAI = arithmetic mean of the six dimensions (equal weights). Dimension detail — D2 Thailand: GMP/HACCP standards, long-term export contracts, technology transfer to cooperatives; D3 Thailand: coconut-milk export growth +16.85% YoY (2024); D6 Gorontalo: fertilizer subsidy + plantation rehabilitation; D6 Thailand: DITP, halal certification, industrial estate, BOI, OTOP. NTPR 2025–2026 range 142.40–158.98 (swing 16.58 pts).

Sources: Authors' own elaboration based on BPS Gorontalo (2025c); Gereffi et al. (2005); Kaplinsky & Morris (2000); Moreno et al. (2020); Ørtenblad et al. (2023); Roring et al. (2023); Wahyudi et al. (2025)

Table 5 reinforces that the difference between Gorontalo and Thailand is not merely a matter of production scale or technology levels, but a systemic structural difference in value chain governance. In GVC terminology, Gorontalo is trapped in what Kaplinsky & Morris (2000) term the *commodity trap*—a condition in which raw material producers lack access to more profitable segments of the value chain. Hence, any benefits from global price increases are temporary and do not generate the accumulation of sustainable productive capacity. This comparison must, however, be read with an important caveat:

Gorontalo is a subnational producing region whereas Thailand is analyzed at the national level, so the two units differ in scale, institutional capacity, and industrial structure. The GAI comparison therefore contrasts governance patterns and value-chain positioning rather than equating the two units as like-for-like cases; the Thai national configuration serves as an aspirational benchmark for the trajectory a producing region such as Gorontalo might pursue, not a directly equivalent counterpart.

Policy Implications: Lessons from the Thai Model for Transforming Gorontalo's Coconut Agribusiness

Drawing on the synthesized findings of the three preceding subsections, this study derives four interrelated strategic policy implications. These implications are grounded in the GVC upgrading strategies framework of Gereffi et al. (2005) and in policy recommendations from the Indonesian coconut agro-industrial literature. Because the analysis rests on comparative secondary data rather than implementation or program-evaluation evidence, these implications are presented as evidence-informed strategic directions rather than prescriptive blueprints; their feasibility depends on local institutional, fiscal, and market conditions outside the scope of this study and warrants dedicated implementation research.

1. Commodity-to-Product Orientation Transformation (Product Upgrading)

The VAG analysis reveals that the largest value-added gap lies between copra (VAM $\sim 7\times$) and high-value processed products such as coconut candy (VAM $\sim 35\times$) or Thailand's packaged coconut water (VAM $\sim 11\times$). The Gorontalo Provincial Government's priority policy is therefore to promote the construction of medium-scale coconut processing units in production centers, following the One Village One Product (OVOP) model recommended by Desrial et al. (2025) for Indonesia's coconut agro-industrial context. Wulandari & Alouw (2021) affirm that developing economically viable agro-industrial business models is the primary prerequisite for this transformation, with a focus on strengthening the capacity of village-based coconut processing SMEs.

2. Strengthening Value Chain Institutions (Functional Upgrading)

Thailand's success in moving coconut farmers to a more advantageous position in the value chain was achieved through institutional integration between farmers, processing cooperatives, and the export industry (Ørtenblad et al., 2023). A similar model needs to be developed in Gorontalo by strengthening vertically integrated coconut processing cooperatives—from raw material procurement to processed product marketing. Tolinggi et al. (2023) emphasize the importance of knowledge co-creation between senior farmers and younger generations in Gorontalo's coconut agribusiness as the institutional foundation required for this transformation.

3. Stabilizing Farm Income through Product Value (Reducing Dependence on the Copra-Based NTPR).

The documented NTPR volatility—swinging between 142 and 159 within a single year—provides empirical evidence that coconut farm income in Gorontalo depends too heavily on global commodity price cycles. Nasution et al. (2024) and Vaulina et al. (2024) find that coconut plantation revitalization must be accompanied by concrete product diversification programs to enhance not only raw material productivity but also value-adding capacity. In the medium term, a measurable policy target could be considered—for illustration, raising the share of coconut output processed into derivative products from below 5 percent currently to 25–30 percent over a multi-year

horizon—though the specific magnitude and timeframe would require a feasibility assessment against local processing capacity and investment conditions.

4. Integration into The Global Value Chain through A Processed-Product Export Orientation.

The Indonesia–Thailand export paradox cannot be resolved by increasing raw material export volumes alone. Thailand demonstrates that — even with a production volume 25 times smaller than Indonesia's — higher export revenues are achievable by concentrating on high-value processed products. Wahyudi et al. (2025) emphasize that building sustainable coconut supply chains in remote areas of Indonesia requires coherent cross-sectoral policy support, including infrastructure, access to financing, and facilitation of product certification for export markets. Zainol et al. (2023), in their systematic review, likewise recommend developing internationally oriented coconut value chains as key to transforming coconut agribusiness in Southeast Asian countries.

CONCLUSION AND RECOMMENDATIONS

This study analyzed the value-added gap in coconut agribusiness between Gorontalo, Indonesia, and Thailand through a *desk-based comparative study* drawing on the GVC framework and the Hayami value-added method. Three principal findings are confirmed from the official secondary data analysis. **First**, a significant value-added gap is quantitatively demonstrated: Indonesia's average coconut export price of USD 318 per tonne compares unfavourably with Thailand's USD 694 per tonne, which, applied to national export volumes, corresponds to an illustrative value differential on the order of USD 327 million per year — an indicative measure of the value left uncaptured under the prevailing commodity orientation rather than a directly realisable gain. The value-added multiplier (VAM) for copra in Gorontalo ranges from approximately 4 to 10 times (averaging 5.7 times), substantially below processed coconut products, which reach up to 35 times (Mardesci et al., 2021), and Thailand's packaged coconut water at approximately 11 times. **Second**, Gorontalo's coconut value chain operates under *market-type* GVC governance, with farmers as price-takers without access to more profitable value chain segments. In contrast, Thailand has advanced toward *modular-relational* governance through integrated processing and high-value export product clusters. **Third**, the volatility of the Farmer Terms of Trade for Plantation Smallholders (NTPR) in Gorontalo — fluctuating between 142.40 and 158.98 within a single year — provides empirical evidence that farm income is structurally dependent on global commodity price cycles rather than on value creation through product processing.

Based on these findings, four policy implications are formulated for the transformation of Gorontalo's coconut agribusiness: (i) *product upgrading* through the establishment of medium-scale village-cluster-based coconut processing units; (ii) *functional upgrading* through the strengthening of vertically integrated processing cooperatives from upstream to downstream; (iii) farm income stabilisation through product diversification that reduces dependence on global copra prices; and (iv) integration into the GVC through a processed-product export orientation supported by cross-sectoral policy. Thailand's experience shows that competitive advantage depends on position within the value chain, not production scale alone.

This study is the first to compare the coconut value-added gap between an Indonesian producing region and Thailand within a single integrated analytical framework, while also demonstrating that a *desk-based comparative study* grounded in

official secondary data can generate findings that are both valid and policy-relevant. Several limitations merit acknowledgment: value-added data for processed products are drawn from studies conducted in Indragiri Hilir rather than directly from Gorontalo, and the GVC analysis is qualitative and descriptive. Future research should use primary household-level data from Gorontalo's coconut farmers and quantitative methods such as structural equation modeling (SEM) or the best-worst method (BWM) to deepen the analysis.

The fundamental problem of coconut agribusiness in Gorontalo — and in Indonesia more broadly — does not lie in production quantity but in *value chain orientation*. As long as farmers remain oriented toward raw commodities, local communities will never fully capture the economic benefits of production superiority. Thailand demonstrates that — with a production volume far smaller than Indonesia's — higher export revenues are nevertheless achievable through a commodity-to-product orientation transformation. A similar transformation in Gorontalo is a realistic strategic possibility — and an urgent one.

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