

Research Article

Open Access

Beyond Export Volume: Value Capture, Trading Hubs, and Equitable Upgrading in the Global Cinnamon Value Chain A Review

Loso Judijanto

IPOSS Jakarta, Indonesia

ABSTRACT

Cinnamon illustrates a persistent paradox in global agricultural trade: the countries that cultivate and supply a commodity do not necessarily capture the largest share of the economic value generated from it. Indonesia, particularly the Kerinci highlands of Jambi and neighboring areas of Sumatra, is a major source of *Cinnamomum burmannii*, yet cinnamon is also exported by non-producing economies such as Singapore. This qualitative integrative literature review examines how value is created, distributed, and captured across the global cinnamon chain and investigates whether producing countries and smallholder farmers receive an equitable share. The analysis integrates recent literature on cinnamon trade, global value chains, smallholder inclusion, geographical indications, sustainability standards, intermediation, processing, traceability, and market power, complemented by official trade statistics. The review finds that production leadership and export competitiveness do not automatically create value-capture leadership. Significant value is generated after the farm gate through aggregation, quality assurance, processing, logistics, finance, certification, formulation, branding, market intelligence, and distribution. Intermediaries and trading hubs therefore perform economically meaningful functions, although information asymmetries, concentrated market power, financing constraints, and weak producer organization may create unequal distributional outcomes. The article proposes an Equitable Cinnamon Value-Chain Upgrading Framework integrating productive capabilities, functional upgrading, producer organization, origin differentiation, traceability, finance, fair contracting, and market development. For Indonesia, the strategic objective should shift from maximizing cinnamon export volume toward maximizing sustainable domestic value added and the proportion of that value ultimately retained by producing communities.

*Corresponding author

Loso Judijanto, IPOSS Jakarta, Indonesia.

Received: September 01, 2026; **Accepted:** September 07, 2026; **Published:** September 15, 2026

Keywords: Cinnamon, Global Value Chains, Value Capture, Smallholder Farmers, Indonesia, Kerinci, Singapore, Geographical Indications, Functional Upgrading, Agrifood Trade

JEL Classification: F14; F63; Q13; Q17; O13

Introduction

Cinnamon is among the oldest internationally traded spices, but the contemporary organization of its trade bears little resemblance to the simple historical image of a commodity moving directly from a producing territory to a consuming market. Modern cinnamon moves through networks of farmers, village assemblers, wholesalers, processors, exporters, international traders, customs brokers, logistics providers, ingredient manufacturers, brand owners, distributors, retailers, and digital commercial platforms. At each node, actors may undertake physical transformation, quality assurance, financing, information processing, risk management, logistical coordination, or market development. Consequently, where cinnamon is grown is not necessarily where its commercial value is recorded, where the product is substantially transformed, or where the largest proportion of economic returns is ultimately captured [1-3].

Indonesia provides a particularly relevant setting for analyzing this distinction. The country has long been one of the world's most important suppliers of cinnamon, particularly *Cinnamomum burmannii*, while the Kerinci highlands and surrounding areas

in Jambi and Sumatra constitute an internationally recognized origin for Indonesian cinnamon. Recent competitiveness studies consistently indicate that Indonesian cinnamon possesses strong comparative advantages in international markets. Nevertheless, export competitiveness measured in terms of volume or revealed comparative advantage is analytically different from the ability of producing regions to capture the value subsequently created through processing, differentiation, branding, logistics, marketing, and downstream commercial functions [4-5].

This distinction becomes visible when observing Singapore. Despite lacking a significant cinnamon-growing base, Singapore appears in international trade statistics as both an importer and an exporter of cinnamon. World Bank World Integrated Trade Solution data based on UN Comtrade show that Singapore imported approximately 417,702 kg of HS 090610 cinnamon worth US\$1.943 million in 2022. Vietnam supplied 193,139 kg, Indonesia 75,159 kg, Madagascar 84,060 kg, China 31,883 kg, and Sri Lanka 3,019 kg. In the same year, Singapore reported exports under the same HS heading of 193,091 kg valued at US\$668,470, including shipments to Vietnam, South Africa, Fiji, Brunei, Turkey, and several other markets [6].

The pattern persists for processed product categories. In 2023, Singapore reported exports of 142,571 kg of crushed or ground cinnamon under HS 090620, with a recorded value of US\$373,420. South Africa accounted for 110,900 kg, followed by Fiji, the

Philippines, Indonesia, Korea, and several smaller destinations. These figures demonstrate that a jurisdiction need not be a major agricultural producer in order to perform economically significant trading and distribution functions within a commodity chain. They do not, however, demonstrate that all cinnamon exported by Singapore originated in Indonesia, nor can the difference between Singapore's import and export statistics be interpreted directly as a Singaporean trading margin or profit. WITS explicitly identifies these flows as gross imports and gross exports, while inventories, changes in product form, different origins, timing differences, domestic use, and customs classifications prevent such a calculation [7].

Indonesia's own export scale is substantially larger. In 2023, Indonesia reported approximately 10.10 million kg of exports under HS 090610 valued at US\$45.87 million. Under HS 090620, Indonesia exported approximately 13.43 million kg valued at US\$53.83 million. These figures underline Indonesia's position as a major producing and exporting country, while at the same time raising a more difficult question: how much of the total value eventually paid by industrial users, food manufacturers, brands, retailers, and consumers remains with the producing economy, and—more importantly how much ultimately reaches cinnamon farmers [8].

This question cannot be answered through gross customs data alone. Export value is not identical to domestic value added; domestic value added is not identical to corporate profit; corporate profit is not identical to farmer income; and higher national processing margins do not automatically improve the distribution of income within the producing region. The appropriate analytical distinction is therefore between **production origin, customs-reported exporter, location of transformation, location of value creation, and location of value capture**. Research on global food expenditure reinforces the importance of this distinction [9]. Estimate that farmers receive, on average, only 27% of consumer expenditure on food consumed at home across their multi-country sample, demonstrating the economic scale of activities undertaken beyond the farm gate. More recent global analysis finds that agricultural production has increasingly shifted toward the Global South while a growing proportion of non-farm food-system income is captured in post-farm activities elsewhere [10].

The cinnamon literature, however, remains more heavily concentrated on production, chemical properties, health applications, export competitiveness, and market performance than on the distribution of value among actors and geographical locations. Indonesian studies demonstrate strong competitiveness and substantial export potential, while localized studies reveal weak bargaining power, dependence on collectors, limited price information, and differences in farmers' shares across marketing channels [11]. Geographical indication research on Koerintji cinnamon further demonstrates that origin recognition and improved practices may generate price differentiation, but such instruments are effective only when governance arrangements allow benefits to travel through the chain to producers [12].

The central argument of this review is consequently that **production leadership does not necessarily produce value-capture leadership**. Value capture depends not only on biological production but also on control over functions, knowledge, standards, finance, information, relationships, intangible assets, and access to final markets. At the same time, a distributive analysis should not presume that processors, traders, or logistics hubs merely extract rents. Intermediaries may reduce transaction and customs costs,

aggregate fragmented supply, finance inventories, maintain quality, manage risk, and connect producers with distant buyers [13]. The relevant normative question is therefore not whether intermediaries exist, but whether the risks, costs, information, negotiating power, and economic rewards in the chain are distributed reasonably among actors.

This article addresses four research questions. First, how is economic value created, distributed, and captured across actors, functions, and geographical locations in the global cinnamon value chain? Second, to what extent do cinnamon-producing countries and smallholder producers capture a proportionate and equitable share of the value generated through international trade? Third, which structural, institutional, technological, and market mechanisms explain differences in value capture among farmers, processors, traders, re-export hubs, brand owners, and downstream actors? Fourth, what combination of functional upgrading, collective action, origin differentiation, processing, traceability, finance, fair contracting, and public policy could enable producing regions to capture a fairer share without destroying economically useful intermediation?

By answering these questions, the article contributes to the literature in three ways. Conceptually, it separates competitiveness from value capture and proposes a multidimensional understanding of equitable producer participation. Empirically, it positions the Indonesian–Singapore trade relationship as an illustration of the separation between production geography and commercial-function geography rather than as evidence of a simple bilateral transfer of profits. From a policy perspective, it develops an integrated pathway for moving producing regions from raw-material specialization toward a broader portfolio of quality, processing, knowledge, commercial, and market functions.

Literature Review

Cinnamon as a Differentiated Agricultural Commodity

Cinnamon is not a homogeneous product. Commercial markets contain several *Cinnamomum* species with different chemical, sensory, physical, safety, and origin characteristics. *Cinnamomum verum* is closely associated with Sri Lankan or Ceylon cinnamon, while *C. burmannii* is strongly associated with Indonesia. Other commercially important types include *C. cassia* and *C. loureiroi*. Differences in morphology, cinnamaldehyde concentration, coumarin levels, volatile compounds, taste, aroma, and processing characteristics create opportunities for both differentiation and substitution [14,15].

Quality differentiation is economically important because cinnamon travels through long and often opaque international supply chains [16]. demonstrate that spectroscopic and chemometric techniques can differentiate species and detect adulteration with high classification accuracy. Such analytical capacity has commercial implications: verifiable identity, purity, origin, moisture control, contaminant management, and chemical composition can transform cinnamon from a generic commodity into a specification-based ingredient. Similarly, health and food-safety concerns related to coumarin underscore why species identification and quality assurance are not merely technical requirements but sources of commercial differentiation [17].

The product hierarchy also extends beyond dried bark. Whole cinnamon, quills, crushed cinnamon, ground powder, essential oils, extracts, oleoresins, flavour formulations, and ingredients for food, nutraceutical, cosmetic, fragrance, and pharmaceutical applications represent different levels and types of transformation. for example,

demonstrate possibilities for exploiting functional properties of *C. burmannii* in food formulations, while document variation and potential applications of Indonesian cinnamon bark oil [18- 19]. Recent work on Ceylon cinnamon shows that fractional distillation and formulation can improve the utility and commercial value of lower-cost essential oils by reproducing premium flavour profiles [20]. These studies illustrate a fundamental value-chain principle: the same biological resource can enter markets with markedly different levels of technological, functional, and commercial sophistication.

The Architecture of Global Cinnamon Trade

Studies of Indonesia's export performance consistently identify substantial comparative advantage. find a positive long-term trend and very strong revealed comparative advantage for Indonesian cinnamon, while show that Indonesia leads in export volume in their study period but trails Sri Lanka in export value. This discrepancy already suggests that volume leadership is not synonymous with value leadership. Differences in species, quality, destination markets, product configuration, origin reputation, processing, and branding can generate different unit values even when countries export products under similar customs headings.

Sri Lanka offers an informative comparison because its cinnamon economy is organized around a strongly differentiated origin identity [21]. Map a chain involving growers, peelers, collectors, balers, exporters, value-added producers, freight forwarders, international buyers, retailers, and brands. This structure makes visible the multitude of economic functions that occur between cultivation and final consumption. Ceylon Cinnamon subsequently obtained recognition in the European Union's protected geographical indication system, reinforcing the possibility of linking origin, intellectual property, quality specification, and market differentiation. Such differentiation does not guarantee farmer welfare, but it expands the economic space in which origin-related value can potentially be created [22].

Indonesia has pursued a related strategy through Koerintji Cinnamon geographical indication. Find that geographical indication arrangements, combined with improved information and production practices, can support origin recognition and price premiums. Nevertheless, a geographical indication is not equivalent to a functioning premium market. Its benefits depend on collective governance, compliance, buyer recognition, quality consistency, enforcement against misuse, and arrangements governing how premiums are transmitted to farmers. Evidence from Indonesian GI systems further shows that perceived economic benefits, attitudes, knowledge, and perceived behavioral control influence farmers' willingness to adopt GI practices, indicating that origin schemes must be understandable and economically credible to producers [23]. Comparative evidence also suggests that place-based quality schemes can support farm continuity and adaptive quality governance when producer organizations and multilevel institutions can coordinate standards, interests, and local knowledge [24,25].

Trade hubs add another layer to the architecture. An economy such as Singapore can perform aggregation, importing, inventory management, repacking, customs clearance, financing, quality control, regional distribution, and re-export functions without cultivating cinnamon domestically. International trade theory increasingly recognizes that intermediaries can reduce fixed and informational trade costs for producers that would otherwise face difficulties accessing foreign buyers directly [13]. The

correct analytical distinction is therefore between **production specialization and functional specialization**.

Global Value Chains, Functional Specialization, and Value Capture

Global value-chain theory provides a framework for analyzing dispersed production and coordination across firms and national borders. Emphasizes that GVC participation involves organizational choices, contractual relationships, cross-border input linkages, and heterogeneous forms of governance. Gross trade statistics are consequently imperfect measures of the economic contribution made by different locations because traded products may incorporate imported inputs and multiple services before reaching final markets.

The "smile curve" literature provides a useful—although not deterministic—heuristic for examining functional differences. Show empirically that positions within global value chains are associated with markedly different value-added outcomes. Likewise finds that specialization in production activities can generate lower value added per unit of output than specialization in certain headquarters or non-production functions. The relevance for cinnamon is not that every spice chain necessarily follows a literal U-shaped value curve, but that cultivation and physical production should not automatically be assumed to capture the highest economic returns.

A parallel pattern is increasingly visible in agrifood systems. Show that post-farmgate activities account for most consumer food expenditure in a large cross-country dataset. Document a widening geographical separation between agricultural production and non-farm food-system income, with agricultural output increasingly concentrated in the Global South while post-farm activities capture increasing income elsewhere [26]. However, demonstrate that participation in global agrifood value chains can also contribute to food-system and development outcomes under particular circumstances, while Nana and Tabe-Ojong find that deeper participation—especially through food and beverage activities can reduce inequality through structural transformation and movement toward better-paid downstream employment [27]. Thus, GVCs should not be interpreted as inherently exploitative or inherently developmental; outcomes depend on the functions performed, institutions governing them, and distribution of capabilities and power [28].

Smallholder Inclusion, Bargaining Power, and Distributive Fairness

Smallholder participation in modern value chains can improve welfare, but participation itself does not establish equitable inclusion [29]. Highlight the importance of market structure and institutional arrangements in determining the future of smallholder farming within modern agricultural systems [30]. Shows that integrated value-chain development can improve farmer welfare when interventions simultaneously address transaction costs and market constraints. Similarly find positive welfare effects from participation in agricultural value chains among vegetable farmers, but access depends on education, infrastructure, credit, farmer-group membership, and extension [31].

Transaction terms matter greatly. Find that smallholders value flexible incentive-based pricing and stable buyer relationships, whereas delayed payments and high investment requirements discourage sustained participation [32]. Contract farming can increase income when coordination reduces uncertainty and

creates market access, but participation is shaped by cooperative membership, certification, infrastructure, technology, information, and firms' support services [33,34].

Collective action is often proposed as an answer to farmer fragmentation, yet the evidence is nuanced [35]. show that transaction-cost considerations influence participation in collective arrangements [36]. Studying Indonesian producer organizations, demonstrate that collective organizations can facilitate network, quality, and governance upgrading. However, show that farmer ownership of trading institutions does not automatically produce inclusive outcomes [37]. They identify ownership, voice, reward, and risk as distinct dimensions of inclusion and show that insufficient working capital can undermine collective organizations' ability to provide favorable payment terms [38]. similarly report mixed effects of producer-organization membership on bargaining and perceived unfair trading practices.

These findings are directly relevant to cinnamon. A farmer cooperative that owns a grinding mill but lacks working capital, stable buyers, quality systems, or professional management may fail to provide better returns than an experienced private trader. Conversely, a private intermediary can create substantial economic value while still operating within a chain characterized by unequal bargaining power. Fairness should therefore be assessed through outcomes and governance rather than ownership labels alone.

Standards, Geographical Indications, and Traceability

Standards can raise product value by reducing information asymmetry, proving compliance, or enabling access to premium markets. finds that certified smallholders receive higher prices and household incomes on average, although effects vary substantially across crops and contexts [39]. Show positive Fairtrade effects after controlling for cooperative characteristics, reinforcing the importance of institutional context [40]. Yet certification also involves costs, possible exclusion, monitoring burdens, and sustainability trade-offs. Meemken et al. [41] argue that standards alone cannot guarantee equity at scale, while emphasize multidimensional trade-offs across economic, environmental, gender, and food-security outcomes [42].

Standards may also redistribute responsibilities without redistributing resources [43]. Show in the banana chain that local producers may bear substantial adaptation and sustainability costs without equivalent influence over downstream decisions [44]. Demonstrate that certification may produce simultaneously positive and negative environmental or health effects, cautioning against simplistic assumptions. At a governance level, note that voluntary sustainability standards have become important transnational instruments but face problems related to inclusiveness, proliferation, and effectiveness [45].

Geographical indications differ from generic sustainability standards because their core asset is territorially embedded reputation [46]. Find an overall positive relationship between GI products and farmer income in their meta-analysis, although effects vary across contexts. The Koerintji case indicates that GI can improve origin recognition and facilitate price differentiation, but stronger producer organization and commercial implementation are required if territorial reputation is to become producer-retained value rather than simply a marketing attribute used downstream [12].

Digital traceability provides another mechanism for reducing informational distance [47]. Review blockchain-based food

traceability and identify potential gains in transparency, data integrity, and supply-chain coordination alongside technical and governance challenges [48]. Likewise show how blockchain traceability could address food fraud, food safety, and supply-chain information problems. Yet information technology should not be equated with economic empowerment [49]. Finds that information interventions often achieve disappointing results when underlying risk, credit, and institutional constraints remain unresolved. Traceability can make a farmer visible without making that farmer powerful. More recent research reinforces this caution: reviews identify standardization, interoperability, participation, and implementation capability as central conditions for blockchain-based agricultural traceability while smallholder evidence from cocoa shows that farmer-side investment can be difficult to justify when added verification burdens are not matched by commensurate income gains [50-52].

Method

This study employs a **qualitative integrative literature review**, explicitly rather than a systematic literature review. The objective is not to estimate a pooled causal effect, construct a PRISMA flow diagram, or claim exhaustive retrieval of every cinnamon publication. Instead, the review integrates several previously fragmented literatures cinnamon production and trade, global value chains, smallholder inclusion, market power, intermediaries, processing, geographical indications, sustainability standards, digital traceability, and agricultural upgrading—to develop an explanatory framework for value creation and value capture.

Integrative reviews are appropriate when a research problem requires critical synthesis across theoretical traditions and heterogeneous forms of evidence [53]. Argue that an effective integrative review moves beyond a descriptive inventory of past work by identifying conceptual tensions and constructing new theoretical perspectives [54]. Similarly emphasize that integrative reviews can combine different types of literature to generate a more comprehensive understanding. Qualitative synthesis also enables interpretation of mechanisms, experiences, institutional arrangements, and contradictions that cannot be reduced to a single statistical effect [55].

The principal literature window was January 2020 to August 2026. Searches emphasized recent peer-reviewed publications indexed or discoverable through major academic databases and publisher platforms using combinations of the terms *cinnamon*, *Cinnamomum burmannii*, *Koerintji cinnamon*, *cinnamon exports*, *spice value chain*, *global value chains*, *agrifood value chains*, *value capture*, *farmer share*, *smallholder*, *intermediaries*, *producer organizations*, *geographical indications*, *certification*, *traceability*, *functional upgrading*, *processing*, *market power*, and *fair trading*. Cinnamon-specific evidence was prioritized wherever available, while broader agrifood evidence was included when it illuminated mechanisms for which cinnamon-specific empirical research remains limited.

The analytical procedure followed four stages. First, evidence was classified according to value-chain node: production, aggregation, processing, export, international intermediation, manufacturing, branding, distribution, and retail. Second, studies were coded according to mechanisms of value creation, including physical transformation, quality control, information, finance, logistics, risk absorption, certification, intellectual property, market access, and branding. Third, the review distinguished value creation from value capture by assessing which actors had bargaining power, ownership of strategic assets, information advantages, market

access, or institutional authority. Fourth, cross-study synthesis identified recurring mechanisms affecting distributive outcomes.

The evidence was interpreted through a hierarchy. Direct cinnamon evidence was given the greatest weight for cinnamon-specific claims. Evidence from comparable spices and tropical agricultural commodities was used to identify plausible mechanisms but was not treated as proof of conditions in the cinnamon chain. Broader agrifood GVC evidence provided structural context, while general GVC research supplied theoretical concepts. This hierarchy is important because findings from cocoa, coffee, bananas, vegetables, dairy, or sesame cannot automatically be transferred to cinnamon.

Official trade data were used only as contextual and descriptive evidence. World Bank WITS/UN Comtrade statistics were examined for Indonesian and Singaporean trade under HS 090610 and HS 090620. These data illustrate gross trade flows; they do not identify firm-level profitability, final origin after re-export, or value-added decomposition. Consequently, the review does not infer trading margins from differences between gross import and export values. Commercial claims concerning “cinnamon bark oil” shipments were also treated cautiously because broad essential-oil customs categories can contain products other than cinnamon oil and shipment databases may employ proprietary product classification.

The review has several limitations. Publicly available cinnamon research rarely provides transaction-level price waterfalls from farm gate to final retail. Re-export statistics do not consistently identify the original producing country after subsequent transformation or redistribution. Different HS revisions also complicate longitudinal comparison. Most importantly, available evidence is insufficient to calculate the exact percentage of global cinnamon value captured by Kerinci farmers, Indonesian processors, Singaporean traders, international ingredient manufacturers, or final brands. The contribution of this review is therefore explanatory and framework-building rather than the provision of an unsupported global margin estimate.

Results

Theme 1: Production Geography and Trade Geography Are Not the Same

The first major finding is that cinnamon’s production geography is only one layer of its global economic geography. A producing region creates the indispensable biological resource, but international commerce adds new locations where the commodity is aggregated, transformed, financed, inspected, stored, packaged, sold, and distributed. Singapore’s simultaneous importing and exporting of cinnamon illustrates this separation. The observation is not anomalous; rather, it is consistent with modern trade in which intermediaries and hubs reduce transaction and border costs and coordinate geographically dispersed commercial functions [13].

This distinction is important for interpreting Indonesia’s position. Indonesia’s 2023 reported exports of more than 10 million kg under HS 090610 and more than 13 million kg under HS 090620 demonstrate a major direct presence in world markets. Singapore’s smaller exports do not displace that production advantage. Instead, they reveal that international markets pay for functions in addition to cultivation, including inventory availability, regional consolidation, buyer access, documentation, rapid fulfillment, product preparation, and risk management.

The literature on GVCs supports this functional interpretation. It emphasizes the fragmentation of production and contractual coordination across boundaries, demonstrates that functional specialization is associated with different levels of value creation. Therefore, asking why Singapore can export cinnamon despite not growing it leads to a more productive question: **which economically remunerated functions are being performed outside producing regions, and which of those functions could competitively be developed within them?**

Figure 1: shows that the central analytical problem becomes clearer when the cinnamon chain is represented as a sequence of functions rather than as a simple farmer-to-exporter transaction. This functional perspective also separates biological production from the commercial capabilities that determine where economic value



Figure 1: Functional Architecture of the Global Cinnamon Value Chain

Source: Authors’ conceptual synthesis based on [1,21, 13,36,9-10].

Figure 1 clarifies why physical cultivation cannot be equated with total value generation. The chain contains services and intangible functions that may require capital, laboratory infrastructure, specialized knowledge, international networks, regulatory compliance, commercial reputation, and buyer relationships. Consequently, a policy that focuses exclusively on increasing yields or export tonnage may improve gross output while leaving the functional structure of value capture largely unchanged.

Theme 2: Export Competitiveness Does Not Automatically Create Value-Capture Leadership

Indonesian cinnamon performs strongly under conventional competitiveness indicators. Supriana, Pane and identify very strong comparative advantage, while find that Indonesia holds a strong competitive position in the United States and other markets.

Yet Rochdiani and Wulandari also highlight the contrast between Indonesia's export-volume leadership and Sri Lanka's stronger position in export value during their period of analysis.

This "competitiveness–value capture paradox" arises because revealed comparative advantage measures relative trade performance rather than distribution of income. A country can be highly competitive in raw or semi-processed commodities while importing advanced inputs, relying on foreign logistics, selling through international intermediaries, lacking consumer brands, and receiving only a fraction of final product value. Conversely, a country with lower physical export volume can generate higher revenue per unit through differentiated varieties, quality segmentation, origin reputation, sophisticated processing, and premium-market access.

The same distinction applies inside Indonesia. National export revenue can increase while farmer income stagnates if gains accrue primarily to other domestic nodes. identify weak farmer bargaining positions and limited price information in the cinnamon marketing system of Sungai Penuh, Jambi. Their comparison of different marketing channels indicates that chain configuration affects margins and farmers' shares. Thus, "Indonesia captures more value" and "Kerinci farmers capture more value" must be treated as separate policy objectives.

Theme 3: Much of Agrifood Value Is Created After the Farm Gate

Global agrifood evidence provides a structural explanation for this result. Yi et al. [9] find that farmers receive, on average, about 27% of at-home consumer food expenditure across 61 countries in their dataset, indicating that post-farmgate functions account for the majority. Goyal, Hickel and Jha [10] extend the distributional analysis internationally and show that non-farm value capture is increasingly geographically separated from agricultural production. These findings do not imply that farming is unimportant; rather, they indicate that increasingly sophisticated food systems remunerate many services beyond biological production.

For cinnamon, these services can include moisture management, microbiological testing, chemical profiling, authentication, sterilization, grinding, standardized particle size, extraction, distillation, formulation, packaging, certification, customs compliance, trade finance, freight coordination, inventory management, market development, and brand-building. Authentication research demonstrates that quality assurance itself can become technically sophisticated, particularly when species substitution or adulteration threatens market trust [15-16]. Essential-oil and formulation research similarly demonstrates that technical transformation can generate distinct product attributes beyond those of raw bark [19-20].

This result changes the meaning of downstreaming. "Processing" should not be reduced to building a grinding mill or essential-oil distillery. Functional upgrading encompasses technical capabilities, market knowledge, standards, formulation expertise, commercial contracts, inventory systems, international sales, and product development. Physical processing without buyers or competitive quality can destroy rather than create value.

Theme 4: Smallholders Face Structural Constraints in Capturing Value

The literature identifies several recurring disadvantages for

smallholders. First, production is fragmented while downstream buying can be relatively concentrated. Second, farmers often need immediate cash and cannot hold inventory strategically. Third, quality differences may not be measured transparently at the farm gate. Fourth, farmers have limited information about export prices, final-product markets, and buyer requirements. Fifth, the fixed costs of certification, laboratories, logistics, and direct exporting can be prohibitive for individual households.

These problems are visible in broader agrifood chains and in Indonesian cinnamon. demonstrate the importance farmers attach to payment speed, contractual stability, and market certainty [32]. Shows that price information alone often has limited impact when credit and risk constraints remain binding [49]. Similarly identify price-information and bargaining problems in Jambi cinnamon marketing. Therefore, transparency is necessary but insufficient: a farmer who knows the international price but must sell immediately to repay debt may still have little negotiating leverage.

Power is also multidimensional. Price-setting power, financing capacity, standard-setting authority, control of infrastructure, and buyer relationships can each influence distributional outcomes [56]. Demonstrate in cocoa that price-setting structures and financial mechanisms can leave major producing countries exposed to global price formation despite their dominant production position [57]. Further argue that corporate concentration can affect market conditions and actors' capacity to exercise agency. These findings should not be mechanically transferred to cinnamon, but they reveal mechanisms that future cinnamon research should investigate.

Figure 2: Distinguishes four geographical questions that are frequently conflated in discussions of commodity trade: where a commodity grows, where it crosses customs borders, where it is functionally transformed, and where income is ultimately retained. The distinction is essential because customs records describe border crossings rather than the full distribution of income across actors and places.



Figure 2: Production Geography versus Value-Capture Geography
Source: Authors' conceptual synthesis based on [1, 2, 3, 9, 56, 10].

The analytical implication of Figure 2 is that customs statistics are a map of border-crossing transactions, not a complete map of income distribution. A rigorous study of fairness would require farm-gate prices, production costs, processor costs and margins, exporter margins, logistics charges, financing costs, transformation yields, buyer prices, wholesale prices, and final-market prices. Without these data, strong claims that any individual trading country is “taking” a particular percentage of Indonesian cinnamon value would exceed the evidence.

Theme 5: Intermediaries Create Value but Can Also Exercise Power

A recurring policy temptation is to conclude that eliminating collectors or traders will automatically increase farmer welfare. The reviewed literature does not support such a generalization. Intermediaries often perform economically necessary functions: aggregating small volumes, grading, transporting goods from remote areas, financing farmers or stocks, matching product specifications, maintaining buyer relationships, bearing price and inventory risks, arranging documentation, and clearing customs. demonstrates that specialized customs intermediaries can reduce fixed costs for firms participating in international trade.

The relevant question is whether compensation for such functions reflects competitive service provision or structurally unequal bargaining [58]. Analysis of the Chadian sesame chain shows that relationships initially characterized as power imbalances can evolve toward forms of interdependence. Conversely, demonstrate that concentrated downstream capabilities can affect price-setting and agency. The policy objective should therefore be **governing intermediation fairly**, not indiscriminately eliminating intermediaries.

This perspective has practical significance in Kerinci. If a village collector provides immediate cash, transports small volumes over difficult terrain, undertakes preliminary sorting, and bears rejection risk, then a cooperative replacing that collector must reproduce those services. Otherwise, shortening the chain on paper may increase farmers’ operational burden without improving net income [37]. Demonstrate precisely this problem: collective ownership is insufficient when trading organizations lack the working capital required to provide favorable payment conditions.

Theme 6: Geographical Indications Can Convert Origin into an Economic Asset

Origin is one of the few strategic assets that cannot simply be relocated to a trading hub. Koerintji cinnamon derives its territorial identity from ecological conditions, cultivation practices, historical knowledge, and reputation associated with the producing landscape. Geographical indication can therefore transform “place” from background information into intellectual-property-supported differentiation.

Provide direct evidence that the Koerintji Cinnamon GI can improve information regarding origin, good agricultural and manufacturing practices, and price differentiation. At a broader level, Li et al. [46] find that GI products can increase farmer income, although their meta-analysis also shows substantial heterogeneity. This is important because GI registration alone cannot create a premium. Premium value requires recognized specifications, enforcement, quality consistency, collective marketing, sufficient market demand, and mechanisms ensuring that producers—not only exporters or foreign brands—receive part of the additional revenue.

Sri Lanka provides a useful strategic comparison. Its Ceylon Cinnamon positioning combines species identity, grading practices, specialized peeling, country-of-origin reputation, downstream producers, and increasingly formalized origin protection [21]. Indonesia need not imitate Sri Lanka’s product identity because *C. burmannii* occupies different markets. Instead, it can develop the distinctive commercial narrative of Koerintji cinnamon around origin, flavour profile, sustainable agroforestry, traceability, producer communities, and verified specifications.

Theme 7: Certification Is Useful Only When the Premium Exceeds the Cost of Compliance

Sustainability and quality certifications can provide access to particular buyers and reduce information asymmetries, but the literature strongly cautions against treating certification as a universal solution. meta-analysis finds positive average price and income effects, yet significant heterogeneity [40]. Likewise find Fairtrade benefits but demonstrate that cooperative characteristics matter to estimated outcomes. Conclude that sustainability standards cannot by themselves achieve equity and sustainability at scale [41].

Compliance can also shift costs toward the weakest nodes [43]. identify asymmetries in responsibility within the banana chain [59]. Find economic, social, environmental, and governance challenges affecting lower-tier crop suppliers. Similarly emphasize interactions and trade-offs among different sustainability outcomes. For cinnamon, this means that demands for traceability, chemical testing, sustainable production, documentation, or deforestation-related compliance should be accompanied by viable financing and commercial rewards.

International buyers can contribute by entering longer-term sourcing arrangements, co-financing traceability and training, paying transparent quality premiums, and sharing transition costs. Public policy can contribute through laboratories, accreditation, extension, and digital infrastructure. Producers should not be expected to absorb escalating compliance costs merely to preserve access to markets where downstream firms retain most of the premium.

Theme 8: Producer Organizations Matter, but Commercial Capability Matters More Than Legal Form

Producer organizations can aggregate volume, standardize practices, improve market information, negotiate contracts, invest in shared processing, and make certification economically feasible. Widadie, Bijman and [36] demonstrate in Indonesia that producer organizations can promote upgrading by improving buyer relationships, quality capabilities, and governance [35]. Show why collective arrangements can reduce transaction problems, while [38]. Find that producer organizations may reduce reported unfair trading practices even though effects on perceived negotiation power are more complex.

However, provide an important warning against romanticizing cooperatives [37]. Their Indonesian evidence shows that collective ownership does not automatically guarantee favorable inclusion when farmer organizations cannot absorb risk or provide direct and timely payment. Thus, the objective for cinnamon should be to develop **commercially capable producer organizations**, not simply to increase the number of legally registered cooperatives.

Such organizations would require professional management, auditable accounting, working capital, quality-assurance systems, access to warehouses, buyer contracts, inventory finance, and

the capacity to distinguish member services from political or social functions. Membership itself must also remain inclusive. Gender research shows that participation in value chains and the benefits received from them can differ substantially by node and context, requiring deliberate attention to voice, ownership, and decision-making [60-61]. Recent evidence from a major kiwifruit-producing region likewise indicates that organizational participation can strengthen farmers' sales bargaining power by reducing information asymmetry, lowering transaction constraints, and broadening marketing channels [62].

Theme 9: Direct Contracting Can Improve Value Capture, but Only Under Appropriate Terms

Direct relationships between farmer organizations and exporters, processors, or international buyers can shorten informational distance and potentially improve price transmission. Finds positive income effects associated with contract farming in Vietnam, while show that cooperative membership, quality certification, firm support, roads, and information significantly affect participation. These findings suggest that contracts work best when embedded within an enabling ecosystem [34].

Direct trade should therefore not be defined merely as removing actors. A genuinely beneficial direct arrangement would provide transparent grades, predetermined pricing formulas or premium rules, rapid payment, credible dispute resolution, clear rejection standards, and appropriate risk-sharing. show that payment delays and investment burdens are particularly important to smallholders, demonstrates the benefits of interventions addressing multiple value-chain constraints simultaneously.

Theme 10: Digital Traceability Can Strengthen Origin Value, but Technology Cannot Replace Institutions

Digital traceability is particularly relevant for origin-branded cinnamon because it can link farm lots with processing, certification, export documentation, and final products. Blockchain and related systems offer potential advantages in data integrity, transparency, and fraud prevention [47-48]. Such systems could strengthen Koerintji origin claims and provide buyers with verifiable information on location, harvest, processing, laboratory results, and chain-of-custody.

Yet the most important data question is not simply whether information is recorded, but who owns it and who benefits economically from it. Van Campenhout [49] shows that ICT solutions addressing information inefficiency frequently struggle when other market failures remain. A traceability database owned exclusively by a downstream buyer may improve the buyer's risk management while providing little bargaining benefit to farmers. A more equitable system would give producer organizations access to relevant commercial data and preserve collective rights over origin information.

Figure 3 illustrates why value-capture opportunities should be understood functionally rather than as a literal estimate of cinnamon margins. The diagram is conceptual and does not claim that every cinnamon chain follows the same numerical distribution.

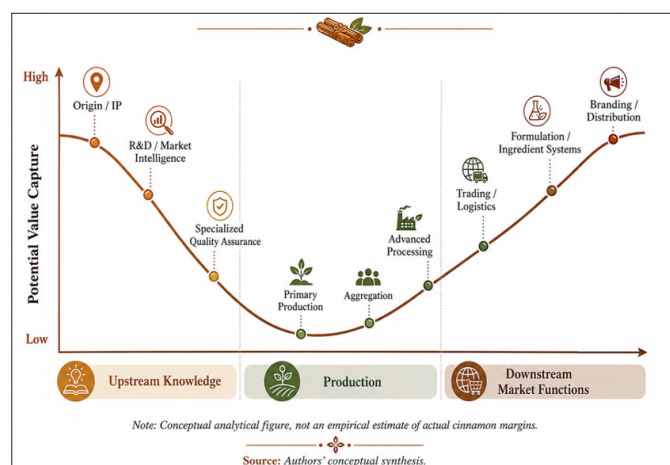


Figure 3: Conceptual Cinnamon Value-Capture Curve

Note: This is a conceptual analytical figure, not an empirical estimate of actual cinnamon margins. Source: Authors' synthesis based on [2,3,9,10].

The figure should not be interpreted as implying that farming always produces the lowest economic return or that branding always produces the highest. Instead, it emphasizes that scarce capabilities and intangible assets can generate rents. If producing regions develop these assets rather than simply performing more physical processing the shape and geographical distribution of value capture can change.

Discussion and Analysis

Do Cinnamon Producers Capture an Equitable Share of Global Value?

The evidence supports a qualified answer. Producing countries such as Indonesia generate indispensable biological and territorial value and can capture substantial export revenue. However, neither production leadership nor high export volume proves that they capture the largest proportion of total economic value generated before the product reaches consumers. Evidence from global agrifood chains indicates that post-farmgate activities account for a substantial and growing share of food-system value [9-10].

At the farmer level, the evidence is even less supportive of an assumption of equitable capture. Localized Indonesian research identifies weak bargaining, limited price information, dependence on collectors, and constraints on product processing among cinnamon farmers [11]. The available literature does not permit calculation of a definitive "farmer percentage" for the whole international cinnamon chain, but it provides sufficient reason to reject the proposition that being the original producer automatically ensures proportional remuneration.

Nevertheless, value-chain participation can produce developmental benefits. Find welfare improvements associated with agrifood-chain participation [26]. Associate global agrifood value-chain participation with several positive food-security outcomes [27]. Find that deeper participation can reduce inequality when it enables movement toward higher-productivity food manufacturing and services. The policy lesson is therefore not withdrawal from international value chains but **upgrading within them**.

From Comparative Advantage to Value-Capture Advantage

Traditional agricultural strategy frequently asks whether a country has comparative advantage in producing a commodity. Indonesia's cinnamon sector clearly performs strongly under this metric [4-5]. A twenty-first-century strategy must add a second question: does the country possess a **value-capture advantage** in the functions surrounding that commodity?

Value-capture advantage consists of the ability to retain economically valuable activities and intangible assets. These include superior quality systems, laboratories, accredited testing, transformation technology, efficient logistics, inventory finance, internationally credible GI institutions, product development, formulation, market intelligence, buyer relationships, digital traceability, and brand equity. Such capabilities are cumulative. A laboratory can support certification; certification can support premium contracts; premium contracts can justify working capital; working capital can strengthen producer aggregation; stable aggregation can justify downstream investment.

This interpretation aligns with the smile-curve literature but adapts it to agriculture demonstrate that functional positions influence value added. For cinnamon, however, the appropriate goal is not simply to move "downstream." Indonesia should seek those downstream or upstream knowledge functions for which it can build a sustainable competitive advantage.

Reinterpreting Singapore: Competitor, Extractor, or Functional Hub?

Singapore should not be framed simply as a country "exporting someone else's cinnamon." Such wording captures the intuitive paradox but risks obscuring the economics of intermediation. The more useful interpretation is that Singapore demonstrates how an economy can participate in commodity value chains through commercial and coordination functions even in the absence of primary production.

The 2022 data show Singapore simultaneously importing and exporting whole cinnamon, while 2023 statistics show exports of crushed or ground cinnamon to multiple markets. Because gross customs flows cannot identify the detailed chain of ownership and transformation, the data do not permit an estimate of the share of Singaporean exports originating in Indonesia or the associated margin. They nevertheless demonstrate that trade functions themselves have geographical locations and that producing countries compete not only in agriculture but also in logistics, finance, processing, distribution, and market connectivity.

The strategic question for Indonesia is therefore not "How can Singapore be stopped from trading cinnamon?" but "Which commercially valuable hub functions can be competitively performed closer to producing regions or elsewhere in Indonesia?" Some activities—such as regional shipping connectivity or sophisticated trade finance—may benefit from established hubs. Other functions—such as origin verification, grading, sterilization, primary processing, extraction, product development, producer-level traceability, and specialized cinnamon marketing—may be capable of deeper localization.

This distinction prevents a zero-sum view of international trade. Efficient trading hubs can expand market access for producers. The challenge is to ensure that producing countries do not remain indefinitely specialized in the functions with the lowest bargaining power and weakest capability accumulation.

The Kerinci Opportunity: Converting Territorial Advantage into Functional Advantage

Kerinci possesses an asset that a trading centre cannot reproduce: an authentic relationship between a distinctive cinnamon product and a producing landscape. The strategic task is to convert that territorial asset into measurable quality, protected origin, commercial recognition, and producer-level income.

The first step is **quality architecture**. Farmers and local organizations require common grading standards, moisture targets, hygienic practices, contamination controls, and access to affordable testing. Research demonstrating reliable species authentication and chemical differentiation offers technical foundations for creating specification-based market segments [15,16].

The second step is **commercial GI development**. Koerintji Cinnamon should be managed not merely as a registration but as a market system. This requires a credible control body, enforcement of origin rules, buyer education, distinctive packaging or B2B documentation, international trademark strategy where appropriate, and transparent premium-sharing rules. Indicate that GI has potential to improve prices and information, demonstrate that GI income effects are possible but context-dependent [46].

The third step is **functional upgrading**. Locally or regionally feasible functions include drying optimization, grading, sterilization, milling, extraction, essential-oil production, standardized ingredients, customized blends, packaging, and traceable export lots. More technologically sophisticated products should be pursued only when commercial demand and quality capabilities exist illustrate how cinnamon can move into functional food and essential-oil applications beyond the raw-bark market.

The fourth step is **commercial organization**. Producer organizations require professional staff, contracts, working capital, and market information. Evidence from Indonesian producer organizations shows that upgrading involves both horizontal coordination among farmers and vertical coordination with buyers [36]. demonstrate why risk-bearing and payment capability are essential if collective trading is to benefit vulnerable producers.

An Equitable Cinnamon Value-Chain Upgrading Framework

The synthesis suggests that equitable upgrading should be evaluated across five dimensions: **reward, risk, voice, information, and capability**. Reward refers to income and premium capture. Risk concerns who absorb production, compliance, inventory, rejection, and price risks. Voice concerns participation in decisions over standards and contracts. Information includes access to prices, specifications, and market opportunities. Capability concerns whether participation allows producers and local firms to accumulate knowledge and assets that improve their future bargaining position.

Figure 4 illustrates that the policy implications are systemic: no single intervention—processing, GI, cooperative formation, traceability, or certification—is sufficient when implemented in isolation. The framework therefore treats equitable value capture as the outcome of mutually reinforcing capabilities and institutions rather than of a single downstream intervention.



Figure 4: Equitable Cinnamon Value-Chain Upgrading Framework
Source: Authors' synthesis based on [63,39,36,37,43,45,59,42].

The framework differs from a conventional downstreaming strategy in two respects. First, it emphasizes commercial capabilities rather than merely physical infrastructure. Second, it makes distributive outcomes explicit. A new cinnamon-extraction factory may increase Indonesian domestic value added while doing little for farmers if procurement remains opaque and no quality premium reaches producers. National upgrading and producer upgrading must therefore be monitored separately.

Policy Priorities for Indonesia

A first policy priority is to replace export-volume targets with a cinnamon value-retention dashboard. Indicators should include export unit values by product form, domestic processing shares, number of traceable premium contracts, GI-certified volume actually sold as GI product, producer share of export value, average net farm income, price premiums for verified quality, value of cinnamon-derived ingredients, and domestic employment in processing and services.

A second priority is a Kerinci Cinnamon Quality and Origin Platform linking farmer groups, laboratories, regional government, research institutions, processors, and exporters. Authentication methods and standardized grading can reduce quality uncertainty, while origin traceability can protect reputation [15-16]. The system should be interoperable and inexpensive enough for smallholders rather than designed only for large exporters.

A third priority is working-capital architecture for producer organizations. Collective trading fails when organizations cannot pay farmers promptly. Dedicated inventory finance, warehouse-receipt mechanisms, buyer-backed financing, or appropriately governed revolving funds could enable producer organizations to aggregate and grade cinnamon without transferring liquidity risk to smallholders. The lessons from collective organizations and contract participation strongly support combining organizational reform with finance [34-37].

A fourth priority is market-linked processing. Public policy should avoid constructing processing facilities without secured markets,

technical competence, or sustainable throughput. Feasibility should begin from buyer specifications and competitive economics, then identify the processing technology required. Potential pathways include cleaned and sterilized bark, premium powders, essential oils, extracts, food ingredients, flavour formulations, and specialized B2B products. Upgrading should be sequenced according to market demand rather than symbolic aspirations to “stop exporting raw materials.”

A fifth priority is fair and transparent contracting. Producer organizations and exporters could develop grade-based reference pricing, rapid payment rules, transparent deductions, independent testing protocols, and dispute-resolution procedures. Contracts should be designed to share the costs of sustainability and traceability requirements rather than allocating them unilaterally to farmers. International experience indicates that stable market relationships and incentive-based pricing matter for sustained smallholder participation [32-33].

A sixth priority is commercialization of Koerintji GI. GI governance should establish which economic actors may use the name, how quality is verified, how origin fraud is sanctioned, and how premiums are measured. International marketing should differentiate Koerintji cinnamon on its own merits rather than positioning it merely as a cheaper substitute for Ceylon cinnamon. A seventh priority is digital market intelligence. Farmers do not need every global price tick, but producer organizations require reliable intelligence on destination markets, quality requirements, competing origins, buyer categories, freight conditions, and product trends [49]. Demonstrates that information systems work best when combined with solutions to credit and risk constraints. Digitalization should therefore complement commercial institutions rather than substitute for them.

An eighth priority is trade-hub learning rather than trade-hub resentment. Singapore's participation should encourage Indonesian institutions to study which services create buyer willingness to transact through hubs: predictable logistics, documentation, financing, dispute resolution, quality systems, multilingual sales capacity, and reliability. Indonesia does not need to replicate Singapore's entire hub model; it needs to identify functions that can be efficiently internalized while retaining beneficial international partnerships.

Avoiding False Solutions

The first false solution is the assumption that all processing automatically adds value. Processing adds value only when the sales value of the output sustainably exceeds the combined cost of raw material, conversion, capital, quality assurance, losses, logistics, marketing, and finance. Poorly designed downstream investment can destroy producer value by creating excess capacity or forcing low-quality products into saturated markets.

The second false solution is that certification automatically generates premiums. Collectively demonstrate that outcomes depend strongly on institutional and market context. Certification without committed buyers can become an additional compliance cost.

The third false solution is that cooperatives automatically eliminate exploitation. Collective action can be highly valuable, but governance, capital, professional management, payment systems, and accountability determine actual outcomes [35-38].

The fourth false solution is that blockchain creates bargaining power. Traceability technologies can improve transparency and authenticity, but they cannot independently solve credit constraints, market concentration, contractual imbalance, or unequal ownership of data [47-49].

The fifth false solution is the assumption that international trade should be reduced to retain value domestically. Emphasizes that international trade can support inclusive and sustainable food-system outcomes when domestic capabilities and institutions are strengthened show that participation in GVCs can generate developmental gains depending on structural conditions. The objective is therefore higher-quality participation, not isolation.

Future Research Agenda

The most important empirical gap is the absence of a comprehensive farm-to-final-market price waterfall for cinnamon. Future research should select representative Indonesian export channels and trace prices, costs, ownership transfers, processing yields, quality premiums, logistics charges, and margins at each stage. Such analysis would make it possible to distinguish service compensation from economic rent and determine which interventions could realistically increase farmer income.

A second priority is transaction-level re-export research. Trade statistics reveal gross flows but not the full origin and ownership history of individual consignments. Research combining customs microdata, bills of lading, firm interviews, and supply-chain traceability could determine how much Indonesian cinnamon passes through hubs such as Singapore, the Netherlands, or other trading centres before reaching final markets.

A third priority is causal evaluation of Koerintji GI. Existing research establishes important associations and mechanisms, but future work should estimate whether GI participation changes net farm income, bargaining power, market stability, product quality, and long-term asset formation relative to comparable non-participants.

A fourth priority concerns processing economics. Cinnamon downstreaming strategies require detailed techno-economic comparison of whole bark, powder, sterilized ingredients, essential oil, extracts, and formulated products. Research should incorporate capital costs, conversion yields, energy requirements, certification, market size, price volatility, and minimum efficient scale.

A fifth priority is distribution within producer communities. Gender and household evidence from other value chains shows that increased chain revenue does not automatically translate into equal control over income or decision-making [60-61]. Cinnamon research should therefore examine women, labourers, landless workers, young people, harvesters, and processors rather than treating “the farmer” as a homogeneous unit.

Finally, value capture should be integrated with ecological sustainability. Cinnamon landscapes can provide environmental benefits, but intensification, soil management, biodiversity, forest relationships, and climate risk should be incorporated into future economic analysis. An equitable chain cannot be considered genuinely successful if short-term income improvements undermine the productive ecosystem on which long-term producer livelihoods depend [62-64].

Conclusion

The global cinnamon economy demonstrates a fundamental principle of contemporary commodity trade: where a commodity is grown is not necessarily where its largest economic returns are generated or retained. Producing landscapes create indispensable biological, ecological, cultural, and labour-based value, but modern value chains add numerous functions after production. Aggregation, quality control, processing, certification, finance, logistics, market intelligence, product development, formulation, branding, distribution, and access to customers can all command economic returns.

Indonesia occupies a strong position in global cinnamon production and exports, particularly through *Cinnamomum burmannii* associated with Kerinci and neighboring Sumatran regions. Its strong comparative advantage should therefore be regarded as a foundation rather than the end point of development strategy. The more important challenge is converting production advantage into value-capture advantage.

The case of Singapore illustrates rather than contradicts this conclusion. Singapore’s recorded cinnamon exports do not imply that it produces the underlying agricultural resource, nor do gross trade statistics demonstrate that it earns a particular margin from Indonesian cinnamon. Instead, its participation demonstrates that trading, logistics, distribution, and coordination functions themselves constitute economically relevant positions within international commodity systems.

A fairer cinnamon economy consequently cannot be achieved solely by exporting more, banning intermediaries, building processing factories, obtaining certificates, forming cooperatives, or introducing blockchain systems. Each instrument can contribute, but only when integrated into a commercially coherent institutional ecosystem. The essential components include farmer-oriented quality upgrading, professionally governed producer organizations, adequate working capital, transparent contracts, strong origin institutions, credible traceability, market-linked processing, laboratories, international marketing, and shared responsibility for compliance costs.

For Kerinci and Indonesia more broadly, the strategic shift should be from “how much cinnamon do we export?” toward “how much sustainable value does cinnamon create in Indonesia, how much of that value remains in producing regions, and what proportion ultimately improves the income, capability, and bargaining position of producers?” These reframing places producer welfare and capability accumulation alongside export performance as explicit measures of sectoral success.

This shift changes the measure of success. Export tonnage remains relevant, but equitable development requires greater domestic value added, stronger local capabilities, better producer incomes, enhanced bargaining voice, lower exposure to asymmetric risks, and ownership of origin-related intangible assets. The objective is not to remove Indonesia from global value chains but to reposition Indonesian actors within them.

In that sense, the future of the Kerinci cinnamon economy lies neither in remaining exclusively a supplier of agricultural raw material nor in attempting to perform every global commercial function domestically. It lies in selecting and building the functions for which Indonesia can create durable competitive advantages while ensuring that the gains from those capabilities are transmitted to the communities that sustain the cinnamon landscape. Only then

can production leadership evolve into equitable value-capture leadership.

References

- Antràs P (2020) Conceptual aspects of global value chains. *The World Bank Economic Review* 34: 551-574.
- Meng B, Ye M, Wei SJ (2020) Measuring smile curves in global value chains. *Oxford Bulletin of Economics and Statistics* 82: 988-1016.
- Stöckinger R (2021) Testing the smile curve Functional specialisation and value creation in GVCs. *Structural Change and Economic Dynamics* 56: 93-116.
- Supriana T, Pane T, Khaliqi M (2022) Export of Indonesian cinnamon in international market: Competitiveness and performance. *Journal of Central European Agriculture* 23: 704-713.
- Rochdiani D, Wulandari E (2023) Competitiveness analysis and factors affecting Indonesian cinnamon exports. *Economies* 11: 55.
- World Bank (2022) World Integrated Trade Solution (WITS): Singapore trade in cinnamon and cinnamon-tree flowers, HS 090610, 2022. UN Comtrade data. <https://wits.worldbank.org/trade/comtrade/en/country/SGP/year/2022/tradeflow/Exports/partner/ALL/product/090610>.
- World Bank (2023) World Integrated Trade Solution (WITS): Singapore exports of crushed or ground cinnamon and cinnamon-tree flowers, HS 090620, 2023. UN Comtrade data.
- World Bank (2023) World Integrated Trade Solution (WITS): Indonesia exports of cinnamon and cinnamon-tree flowers, HS 090610 and HS 090620, 2023. UN Comtrade data. <https://wits.worldbank.org/trade/comtrade/en/country/IDN/year/2023/tradeflow/Exports/partner/ALL/product/090610>.
- Yi J, Meemken E-M, Mazariegos-Anastassiou V, Liu J, Kim E, et al. (2021) Post-farmgate food value chains make up most of consumer food expenditures globally. *Nature Food* 2: 417-425
- Goyal M, Hickel J, Jha P (2025) Increasing inequality in agri-food value chains: Global trends from 1995-2020. *Global Food Security* 46: 100883
- Chatra A, Rosi AI (2024) Marketing channel analysis, marketing margins, and farmer's share cinnamon commodity in Sungai Penuh City, Jambi Province, Indonesia. *Agro Bali Agricultural Journal* 6: 595-607
- Menggala SR, Vanhove W, Muhammad DRA, Rahman A, Speelman S, Van Damme P (2021) The effect of geographical indications (GIs) on the Koerintji cinnamon sales price and information of origin. *Agronomy* 11: 1410
- Medin H (2021) Customs brokers as intermediaries in international trade. *Review of World Economics* 157: 295-322
- Newerli-Guz J, Śmiechowska M (2022) Health benefits and risks of consuming spices on the example of black pepper and cinnamon. *Foods* 11: 2746
- Rana P, Sheu SC (2023) Discrimination of four *Cinnamomum* species by proximate, antioxidant, and chemical profiling: Towards quality assessment and authenticity. *Journal of Food Science and Technology* 60: 2639-2648.
- Lixourgioti P, Goggin KA, Zhao X, Murphy DJ, van Ruth S, Koidis A (2022) Authentication of cinnamon spice samples using FT-IR spectroscopy and chemometric classification. *LWT* 154: 112760
- Heghes SC, Vostinaru O, Mogosan C, Miere D, Iuga CA, et al. (2022) Safety profile of nutraceuticals rich in coumarins: An update. *Frontiers in Pharmacology* 13: 803338.
- Nunes C, Raposo MFJ, Petronilho S, Machado F, Fulgêncio R, et al. (2022) *Cinnamomum burmannii* decoction A thickening and flavouring ingredient. *LWT* 153: 112428.
- Budiastuti, Nurcholida RD, Primaharinastiti R, Sukardiman (2022) The potency of cinnamon bark oil (*Cinnamomum burmannii* Blume) from 5 regions in Indonesia as anti-inflammatory. *Pharmacognosy Journal* 14: 154-164.
- Lokuge CMP, Weeratunge HD, De Silva HIC, Galabada Arachchige SP (2026) Development of a natural flavour formulation simulating premium-grade Ceylon cinnamon bark essential oil as a value addition approach. *Journal of Essential Oil Research* 38: 263-278.
- Hettiarachchi IC, De Silva DAM, Esham M, Liyanagamage TM, Abeysinghe AMIP, et al. (2020) An assessment of market landscape of cinnamon in Sri Lanka. *The Journal of Agricultural Sciences Sri Lanka* 15: 198-206.
- European Commission (2022) Commission Implementing Regulation (EU) 2022/144 registering Ceylon Cinnamon as a Protected Geographical Indication. Official Journal of the European Union. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32022R0144>.
- Laksono P, Irham, Mulyo JH, Suryantini A (2022) Farmers' willingness to adopt geographical indication practice in Indonesia: A psycho behavioral analysis. *Heliyon* 8: 10178.
- Takayama T, Norito T, Nakatani T, Ito R (2021) Do geographical indications preserve farming in rural areas? Evidence from a natural experiment in Japan. *Food Policy* 102: 102101.
- Penker M, Scaramuzzi S, Edelmann H, Belletti G, Marescotti A, Casabianca F, Quiñones-Ruiz XF (2022) Polycentric structures nurturing adaptive food quality governance Lessons learned from geographical indications in the European Union. *Journal of Rural Studies* 89: 208-221.
- Tabe-Ojong MPJ, Nana I, Zimmermann A, Jafari Y (2024) Trends and evolution of global value chains in food and agriculture: Implications for food security and nutrition. *Food Policy* 127: 102679.
- Nana I, Tabe-Ojong MPJ (2026) Global agrifood value chains, structural transformation and income inequality. *Agricultural Economics* 57: 70097.
- Carpa N, Martínez-Zarzoso I (2022) The impact of global value chain participation on income inequality. *International Economics* 169: 269-290.
- Ma M, Sexton RJ (2021) Modern agricultural value chains and the future of smallholder farming systems. *Agricultural Economics* 52: 591-606.
- Kuijpers R (2020) Integrated value chain development: Evidence from Bangladesh. *Food Policy* 97: 101916.
- Ma W, Abdul-Rahaman A, Issahaku G (2023) Welfare implications of participating in agri-value chains among vegetable farmers in Northern Ghana. *Agribusiness* 39: 793-811.
- Ola O, Menapace L (2020) Smallholders' perceptions and preferences for market attributes promoting sustained participation in modern agricultural value chains. *Food Policy* 97: 101962.
- Hoang V (2021) Impact of contract farming on farmers' income in the food value chain: A theoretical analysis and empirical study in Vietnam. *Agriculture* 11: 797.
- Hoang V, Nguyen V (2023) Determinants of small farmers' participation in contract farming in developing countries: A study in Vietnam. *Agribusiness* 39: 836-853.
- Ciliberti S, Frascarelli A, Martino G (2020) Drivers of participation in collective arrangements in the agri-food supply chain: Evidence from Italy using a transaction costs economics perspective. *Annals of Public and Cooperative Economics* 91: 387-409.

36. Widadie F, Bijman J, Trienekens J (2021) Value chain upgrading through producer organisations: Linking smallholder vegetable farmers with modern retail markets in Indonesia. *International Journal on Food System Dynamics* 12: 68-82.
37. Untari DW, Vellema S (2022) Are collective trading organisations necessarily inclusive of smallholder farmers? A comparative analysis of farmer-led auctions in the Javanese chilli market. *Journal of Agricultural and Environmental Ethics* 35: 19.
38. Di Marcantonio F, Havari E, Colen L, Ciaian P (2022) Do producer organizations improve trading practices and negotiation power for dairy farms? Evidence from selected EU countries. *Agricultural Economics* 53: 121-137.
39. Meemken EM (2020) Do smallholder farmers benefit from sustainability standards? A systematic review and meta-analysis. *Global Food Security* 26: 100373.
40. Sellare J, Meemken E-M, Kouamé C, Qaim M (2020) Do sustainability standards benefit smallholder farmers also when accounting for cooperative effects? Evidence from Côte d'Ivoire. *American Journal of Agricultural Economics* 102: 681-695.
41. Meemken EM, Barrett CB, Michelson HC, Qaim M, Reardon T, Sellare J (2021) Sustainability standards in global agrifood supply chains. *Nature Food* 2: 758-765.
42. Wollni M (2025) Sustainability standards in agri-food value chains Impacts and trade-offs for smallholder farmers. *Agricultural Economics* 56: 373-389.
43. Coral C, Mithöfer D (2023) Contemporary narratives about asymmetries in responsibility in global agri-food value chains: The case of the Ecuadorian stakeholders in the banana value chain. *Agriculture and Human Values* 40: 1019-1038.
44. Sellare J, Meemken EM, Qaim M (2020) Fairtrade, agrochemical input use, and effects on human health and the environment. *Ecological Economics* 176: 106718.
45. Marx A, Depoorter C, Fernandez de Cordoba S, Verma R, Araoz M, et al. (2024) Global governance through voluntary sustainability standards: Developments, trends and challenges. *Global Policy* 15: 708-728.
46. Li C, Ban Q, Ge L, Qi L, Fan C (2024) The relationship between geographical indication products and farmers' incomes based on meta-analysis. *Agriculture* 14: 798.
47. Feng H, Wang X, Duan Y, Zhang J, Zhang X (2020) Applying blockchain technology to improve agri-food traceability A review of development methods, benefits and challenges. *Journal of Cleaner Production* 260: 121031.
48. Collart AJ, Canales E (2022) How might broad adoption of blockchain-based traceability impact the U.S. fresh produce supply chain? *Applied Economic Perspectives and Policy* 44: 219-236.
49. Van Campenhout B (2022) ICTs to address information inefficiencies in food supply chains. *Agricultural Economics* 53: 968-975.
50. Bosona T, Gebresenbet G (2023) The role of blockchain technology in promoting traceability systems in agri-food production and supply chains. *Sensors* 23: 5342.
51. Pang S, Teng SW, Murshed M, Bui CV, Karmakar Pet al. (2024) A survey on evaluation of blockchain-based agricultural traceability. *Computers and Electronics in Agriculture* 227: 109548.
52. Steinke J, Ivanova Y, Jones SK, Minh T, Sánchez A, Sánchez-Choy J, Mockshell J (2024) Digital sustainability tracing in smallholder context: Ex-ante insights from the Peruvian cocoa supply chain. *World Development Sustainability* 5: 100185.
53. Elsbach KD, van Knippenberg D (2020) Creating high-impact literature reviews: An argument for 'integrative reviews'. *Journal of Management Studies* 57: 1277-1289.
54. Lubbe W, ten Ham-Baloyi W, Smit K (2020) The integrative literature review as a research method: A demonstration review of research on neurodevelopmental supportive care in preterm infants. *Journal of Neonatal Nursing* 26: 308-315.
55. Flemming K, Noyes J (2021) Qualitative evidence synthesis: Where are we at? *International Journal of Qualitative Methods* 20.
56. Staritz C, Tröster B, Grumiller J (2023) Price-setting power in global value chains: The cases of price stabilisation in the cocoa sectors in Côte d'Ivoire and Ghana. *The European Journal of Development Research* 35: 840-868.
57. Clapp J, Vriezen R, Laila A, Conti C, Gordon L, et al. (2025) Corporate concentration and power matter for agency in food systems. *Food Policy* 134: 102897.
58. Corsi S, Filippini R (2023) From power imbalance to interdependence: A case study of the Chadian sesame supply chain. *The European Journal of Development Research* 35: 684-714.
59. Khan M, Papadas D, Arnold L, Behrendt K (2024) Sustainability challenges in the multitier crop agri-food sector: A systematic review. *Agricultural and Food Economics* 12: 25.
60. Malapit H, Ragasa C, Martinez EM, Rubin D, Seymour G, et al. (2020) Empowerment in agricultural value chains: Mixed methods evidence from the Philippines. *Journal of Rural Studies* 76: 240-253.
61. Quisumbing A, Heckert J, Faas S, Ramani G, Raghunathan K, et al. (2021) Women's empowerment and gender equality in agricultural value chains: Evidence from four countries in Asia and Africa. *Food Security* 13: 1101-1124.
62. Li X, Li Y, Lu Q (2025) Can organizational participation enhance farmers' sales bargaining power? Empirical evidence from a major kiwifruit producing region in China. *Agribusiness*.
63. German LA, Bonanno AM, Foster LC, Cotula L (2020) 'Inclusive business' in agriculture: Evidence from the evolution of agricultural value chains. *World Development* 134: 105018.
64. Van Berkum S (2021) How trade can drive inclusive and sustainable food system outcomes in food deficit low-income countries. *Food Security* 13: 1541-1554.

Copyright: ©2026 Loso Judijanto. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.