

SIAPA YANG MENANGKAP NILAI? TINJAUAN SISTEMATIS DISTRIBUSI MANFAAT EKONOMI DAN MEKANISME PENANGKAPAN NILAI DALAM RANTAI NILAI TUNA GLOBAL

WHO CAPTURES THE VALUE? A SYSTEMATIC REVIEW OF ECONOMIC BENEFIT DISTRIBUTION AND VALUE CAPTURE MECHANISMS IN GLOBAL TUNA VALUE CHAINS

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Abstrak

Tuna merupakan komoditas laut yang sangat terintegrasi secara global, tetapi nilai ekonomi dari penangkapan, pengolahan, perdagangan, sertifikasi, logistik, dan ritel tidak selalu dinikmati secara proporsional oleh aktor dan komunitas yang paling bergantung pada sumber daya tersebut. Tinjauan literatur sistematis ini menganalisis bagaimana manfaat ekonomi diciptakan, dikuasai, dan didistribusikan dalam rantai nilai tuna global. Protokol berbasis PRISMA mengidentifikasi 827 publikasi Scopus; setelah penyaringan tahun publikasi, jenis dokumen, bahasa, dan relevansi, 24 studi disintesis secara tematik. Temuan menunjukkan bahwa penangkapan nilai ditentukan oleh posisi aktor, kemampuan pengolahan dan rantai dingin, akses pembiayaan dan informasi pasar, sertifikasi, ketertelusuran, serta kekuatan tawar. Pada perikanan tuna artisanal Kenya, pengolah yang mayoritas perempuan mencatat margin laba bersih tertinggi sebesar 49,5%, sementara nelayan menghadapi keterbatasan pembiayaan, informasi, transportasi, dan infrastruktur pascapanen. Ketimpangan gender, kerentanan tenaga kerja, kualitas institusi, dan pengaturan sertifikasi turut memengaruhi distribusi manfaat. Kajian ini mengusulkan Tuna Value Capture Framework yang menghubungkan posisi aktor, kapabilitas upgrading, kekuatan pasar, tata kelola, dan inklusi sosial untuk mendorong distribusi nilai yang lebih adil.

Kata-Kata Kunci: rantai nilai tuna; distribusi manfaat ekonomi; penangkapan nilai; perikanan skala kecil; rantai nilai global

Abstract

Tuna is a highly integrated global marine commodity, yet the economic value generated through harvesting, processing, trade, certification, logistics, and retail is not captured proportionately by the actors and communities most dependent on the resource. This systematic literature review examines how economic benefits are created, appropriated, and distributed across global tuna value chains. A PRISMA-informed protocol identified 827 Scopus records; after publication-year, document-type, language, and relevance screening, 24 studies were included in the thematic synthesis. Findings show that value capture is shaped by actor position, processing and cold-chain capability, access to finance and market information, certification, traceability, and bargaining power. In Kenya's artisanal tuna chain, processors, predominantly women, recorded the highest net profit margin (49.5%), while fishers faced constraints in finance, information, transport, and post-harvest infrastructure. Gender inequality, labour vulnerability, institutional quality, and certification arrangements further condition benefit distribution. The review proposes a Tuna Value Capture Framework linking actor position, upgrading capability, market power, governance, and social inclusion to support more equitable value distribution.

Keywords: tuna value chain; economic benefit distribution; value capture; small-scale fisheries; global value chains

BACKGROUND

Tuna is a globally traded seafood commodity that generates income, foreign exchange, employment, and food-security benefits across harvesting, processing, trade, and service activities. However, participation in the chain does not guarantee proportional value capture. Evidence from the Western and Central Pacific shows that

economic roles extend from industrial fleets to processors, traders, informal enterprises, and women workers, while country cases in Iran, the Philippines, and Taiwan demonstrate that processing capability, market access, transport, and product diversification influence how much value remains with local actors (Barclay et al., 2022; Delfino, 2023; Sistani et al., 2021; Liu et al., 2024).

The distributional problem is especially important because tuna is perishable and its value depends on maintaining quality, coordinating logistics, and accessing higher-value markets. Cold-chain limitations can reduce competitiveness and value retention, while differences in institutional quality and participation in higher-value functions affect the gains available to producing countries and firms (Efani et al., 2024; Egunjobi & Ngepah, 2022). Actor position therefore matters: value may be created at harvest, but it can be captured downstream through processing, standards, information, finance, market intermediation, and customer access.

Value capture is also shaped by governance and social relations. Traceability, certification, fisheries regulation, and co-management can improve market credibility and sustainability, but they may also impose costs on actors with limited capital or organizational capacity (Thorpe et al., 2022; Bharathi S et al., 2025; Costa et al., 2026). At the same time, gender and labour relations affect who converts participation into income and influence. Women are prominent in tuna processing and trading, yet recognition and decision-making remain uneven, while labour conditions can limit the quality of benefits generated by industrial production (Barclay et al., 2022; Garlock et al., 2026; Garcia Lozano et al., 2022; Campling & Kim, 2025).

Conceptually, the review combines a global value-chain perspective with livelihood and political-economy concerns. The GVC lens directs attention to functional upgrading and control over higher-return activities, while livelihood analysis asks whether chain participation improves income security, food access, and resilience. Political economy adds the role of institutions, regulation, subsidies, labour relations, and bargaining power. Together, these perspectives explain why similar levels of production can generate different distributive outcomes across actors and places (Egunjobi & Ngepah, 2022; Arthur et al., 2022; Campling & Kim, 2025).

The 24-study evidence base also suggests that value capture should be assessed using multiple indicators rather than a single measure. Net margins, employment, public revenue, market access, compliance costs, food-security effects, and decision-making power represent different dimensions of benefit. For example, processor margins in Kenya reveal a direct distributional pattern, while subsidy dependence in European purse-seine fleets and gendered influence in seafood systems demonstrate that apparently successful chains can still conceal unequal or externally supported outcomes (Mzingirwa et al., 2025; Froment et al., 2025; Garlock et al., 2026).

This review addresses a gap in the literature by treating economic benefit distribution—not only efficiency or sustainability—as the central outcome. It asks who captures value in global tuna value chains and through which mechanisms. The analysis integrates value-chain position, upgrading capability, market power, governance, and social inclusion into a Tuna Value Capture Framework, while examining four themes: value creation, benefit distribution, governance and market power, and social equity and livelihood outcomes.

RESEARCH METHOD

Search Strategy

This systematic literature review followed a PRISMA-informed sequence of identification, screening, eligibility assessment, and inclusion (Page et al., 2021).

Scopus was used as the primary database. The search combined tuna terms, value-chain terms, and actor terms: ("tuna" OR "tuna fisheries" OR "tuna industry") AND ("value chain analysis" OR "global value chain*" OR "fish value chain" OR "seafood value chain") AND ("fisher*" OR "fishers" OR "small-scale fisher*" OR "processor*" OR "trader*" OR "exporter*" OR "retailer*").

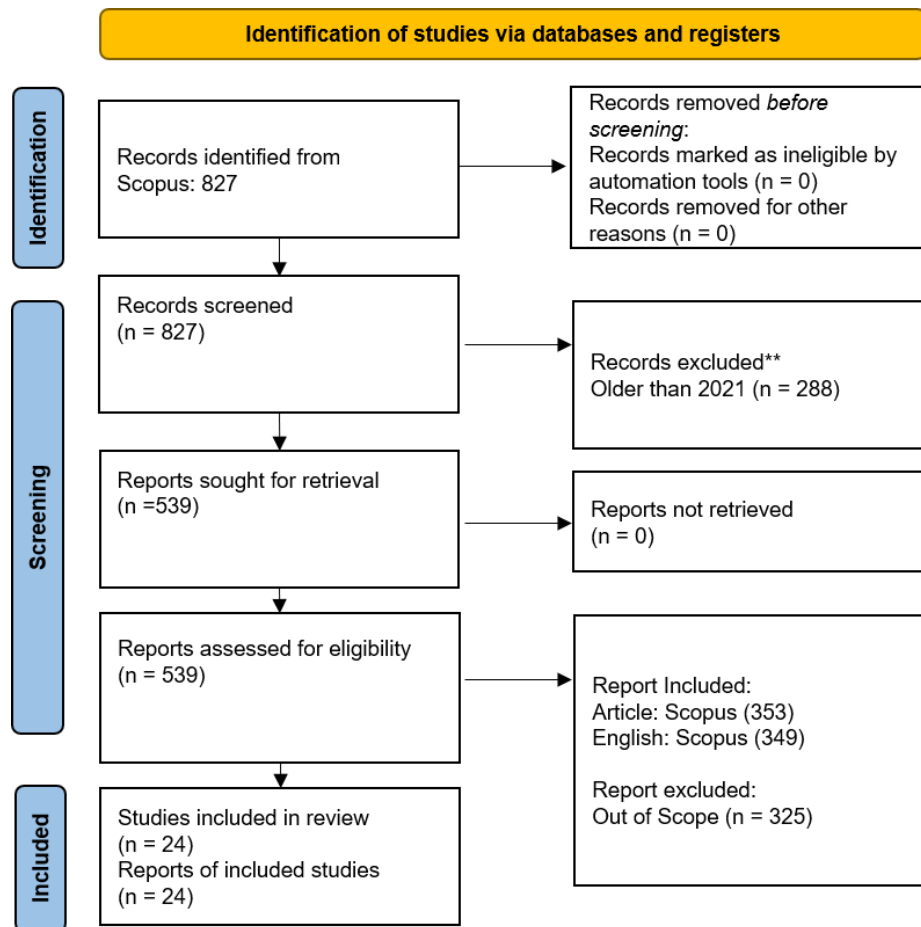
The search identified 827 Scopus records. Screening excluded 288 records published before 2021, leaving 539 reports sought for retrieval; none were unobtainable. Publication-type filtering retained 353 articles and the English-language filter retained 349 records. Relevance screening excluded 325 out-of-scope records, resulting in 24 studies included in the final thematic synthesis. These counts are retained unchanged in Figure 1.

Eligibility Criteria

Eligible studies were peer-reviewed English-language publications from 2021–2026 with empirical or conceptual relevance to tuna fisheries, tuna-related industries, value chains, markets, or the distribution of economic and social benefits. Studies focused only on biology or stock assessment, non-peer-reviewed publications, and studies without a clear value-chain economic link were excluded. A limited number of transferable seafood studies were retained when they directly addressed mechanisms central to tuna value chains, such as GVC participation, traceability, labour governance, benefit distribution, or gendered influence.

Screening, Selection, Quality Assessment and Synthesis

Data were extracted into four themes: (1) chain structure and value creation; (2) economic benefit distribution and value capture; (3) governance, institutions, traceability, certification, and market power; and (4) gender, labour, livelihoods, inclusion, and equity. Methodological quality was assessed narratively from peer-review status, design transparency, relevance, and extractable evidence. Because study designs and indicators were heterogeneous, the synthesis was narrative and comparative rather than meta-analytic. The final set of 24 studies is preserved across the four thematic tables.

Figure 1. PRISMA flow diagram illustrating literature identification, screening, eligibility assessment, and final inclusion.

RESULT AND DISCUSSION

Structure of Global Tuna Value Chains and Mechanisms of Value Creation

Tuna value chains are structurally diverse, and higher value is not confined to harvesting. Across the Pacific and country cases in the Philippines, Iran, Indonesia, Taiwan, and Solomon Islands, processing, cold-chain management, logistics, product diversification, domestic distribution, and service activities determine where value is retained (Barclay et al., 2022; Delfino, 2023; Sistani et al., 2021; Efani et al., 2024; Liu et al., 2024; Fatai et al., 2026). Diversification can also support food security and resilience (Bennett et al., 2025). Meanwhile, European purse-seine evidence shows that apparent profitability may depend heavily on subsidies, indicating that gross market value should be distinguished from economically sustainable value creation (Froment et al., 2025). Table 1 summarizes these eight studies.

Taken together, these studies indicate three recurring routes to value creation: preserving product quality, extending functions beyond capture, and connecting tuna production to domestic as well as export markets. The distributional implication is important: investments that increase total chain value do not automatically increase fisher returns unless upstream actors also gain access to infrastructure, finance, organization, or market channels. Consequently, upgrading should be evaluated by both the amount of value generated and the share retained by local actors.

Table 1. Essential summary of findings on global tuna value-chain structures and value-creation mechanisms.

Reference	Region	Actors	Value activities	Key finding
Barclay et al. (2022)	W. & Central Pacific	Fleets; processors; traders; women workers	Harvesting; processing; trade	Women are central to processing/trading but under-recognized in policy.
Delfino (2023)	Philippines	Fishers; traders; processors	Capture; trade; processing	11 chain configurations; finance, technology, regulation and seasonality constrain upgrading.
Efani et al. (2024)	East Java, Indonesia	Fishers; traders; logistics	Handling; cold chain; transport	Product quality and weak cold chain are key risks to value retention.
Bennett et al. (2025)	Pacific Islands	Communities; fishers; processors	Coastal value-chain diversification	Diversification can reduce tuna dependence and support resilience.
Fatai et al. (2026)	Solomon Islands	Industry; government; communities	Bycatch/tuna distribution	Domestic tuna/bycatch supply can support food security.
Froment et al. (2025)	European purse-seine	Firms; fleets; governments; workers	Industrial fishing; access; trade	EUR 2.1 billion subsidies (2010–2023) materially supported profitability.
Sistani et al. (2021)	Iran	Fishers; processors; exporters; regulators	Capture; processing; export	Unfair profit distribution, weak diversification and logistics reduce performance.
Liu et al. (2024)	Taiwan longline	Firms; suppliers; processors; services	Production; processing; services	Greater processing/service participation can expand domestic value capture.

Economic Benefit Distribution and Value Capture Among Actors

Economic benefits are distributed unevenly across chain positions. In Kenya, fishers sold 53% of catch to agents, 20% to traders, and 18% to processors, while processors—predominantly women—recorded the highest net profit margin at 49.5% (Mzingirwa et al., 2025). Similar evidence from Iran and the Philippines shows that finance, technology, regulation, seasonality, payment conditions, and market access shape actors' capacity to retain value (Sistani et al., 2021; Delfino, 2023). Cross-country evidence further links value addition to institutional quality and forward GVC participation, while demand, labour regimes, gender, and cross-border externalities expand the concept of value capture beyond direct margins (Egunjobi & Ngpah, 2022; Castro et al., 2021; Campling & Kim, 2025; Barclay et al., 2022; Chen et al., 2025). Table 2 presents the distributional evidence.

Table 2. Economic benefit distribution and value-capture mechanisms in tuna value chains.

Reference	Region	Actors	Indicator	Distribution	Key finding
Eegunjobi&Ngepah (2022)	32 developing exporters	Producers; exporters	GVC participation	Low forward participation	Institutional quality shapes upgrading and gains from trade.
Delfino (2023)	Philippines	Fishers; traders; processors	Profitability	Profits across nodes	Capital, technology and regulation shape retained value.
Barclay et al. (2022)	W. & Central Pacific	Workers; women processors; traders	Employment/livelihoods	Gendered benefits	High participation does not ensure policy influence.
Castro et al. (2021)	S. Philippines	Manufacturers; retailers; consumers	Demand elasticities	Market-dependent	Income, price and product differentiation affect market value.
Chen et al. (2025)	Global seafood trade	Producers; exporters; consumers	Trade-embedded costs	Cross-border burdens	43% of production-embedded methylmercury was redistributed through trade.
Campling& Kim (2025)	Industrial tuna	Owners; firms; workers	Labour regimes	Organization-dependent	Technology, access and firm organization shape labour outcomes.
Mzingirwa et al. (2025)	Kenya artisanal tuna	Fishers; agents; traders; processors	Sales & net margin	Processors highest	Processors, mainly women, had 49.5% net margin; fishers faced finance/infrastructure constraints.

The evidence therefore cautions against using landing value or export value as a proxy for actor welfare. Downstream actors can capture larger margins because they control transformation, timing, information, standards, or customer relationships, while upstream actors may absorb biological, weather, and quality risks. A distributive assessment must consequently distinguish who generates value, who controls the conditions of exchange, and who bears the costs required to access higher-value markets.

Governance, Institutions, and Market Power Influencing Value Distribution

Governance determines both opportunities and compliance burdens. In the Galapagos, the longline debate shows that conservation rules gain legitimacy when monitoring and enforcement are combined with market incentives, fisher participation, upgrading, and adaptive co-management (Castrejón & Defeo, 2023a, 2023b, 2025). Institutional quality influences the ability to move beyond primary production (Eegunjobi & Ngepah, 2022), while blockchain and digital traceability can improve transparency and market access but face cost, interoperability, data-quality, and unequal-access constraints (Bharathi S et al., 2025; Costa et al., 2026). Tuna traceability under EU partnership arrangements likewise shows that cross-jurisdiction complexity and misreporting incentives can create gaps despite formal certification systems (Thorpe et al., 2022). Table 3 summarizes these governance mechanisms.

Table 3. Institutional and governance factors shaping tuna value capture.

Reference	Mechanism	Stakeholders	Institutional effect	Implication
Castrejón&Defeo (2023a)	Ecosystem-based management	Fishers; residents; government	Conservation–livelihood trade-off	Mitigation, monitoring and incentives can improve legitimacy.
Castrejón&Defeo (2023b)	Longline regulation	Fishers; regulators	Ban and IUU incentives	Rules need socioeconomic feasibility and adaptive management.
Castrejón&Defeo (2025)	Adaptive co-management	Fishers; government; scientists	Ecological/economic resilience	Combines reform, incentives, upgrading and participation.
Egunjobi&Ngepah (2022)	Institutional governance	Developing exporters	GVC upgrading capacity	Stronger institutions support movement beyond primary production.
Bharathi S et al. (2025)	Blockchain governance	Producers; regulators; chain actors	Transparency/accountability	Benefits depend on data quality, participation, security and cost.
Costa et al. (2026)	Digital traceability	Fishery actors; regulators; consumers	Market access/compliance	Benefits coexist with cost, interoperability and access barriers.
Thorpe et al. (2022)	EU SFPAs & traceability	Fleets; processors; regulators; states	Cross-jurisdiction traceability	Complex movements and misreporting incentives create traceability gaps.

Two governance pathways are visible across the studies. The first emphasizes restriction, monitoring, and enforcement; the second combines rules with incentives, infrastructure, participation, and market access. The second pathway is more directly aligned with equitable value capture because it recognizes that compliance capacity is uneven. Traceability and certification can support accountability, but their benefits depend on whether weaker actors can afford participation and convert verified compliance into higher prices, improved market access, or stronger bargaining power.

Social Equity, Livelihood Outcomes, and Pathways Toward Inclusive Tuna Value Chains

Value distribution is also social. Women are important in tuna processing and trading but remain less visible in policy and business decision-making (Barclay et al., 2022; Garlock et al., 2026). Intersectional evidence shows that benefits vary by gender, nationality, marital status, technology, and authority (Ferguson, 2021), while labour research emphasizes worker voice, rights, remedy, and enforceable accountability as conditions for decent work (Garcia Lozano et al., 2022; Decker Sparks et al., 2022). Small-scale fisheries research further shows that market integration changes access to fish, income, and food-system benefits (Arthur et al., 2022). Thus, inclusive upgrading requires not only higher-value products but also recognition, bargaining power, decent work, and livelihood protection. Table 4 synthesizes these six studies.

Table 4. Social equity and livelihood outcomes associated with tuna value chains.

Reference	Social dimension	Population	Outcome	Equity implication
Barclay et al. (2022)	Gender participation	Women in processing/trade	High participation; low recognition	Governance should recognize women across the chain.
Ferguson (2021)	Intersectional inequality	Fishing communities	Benefits vary by identity/access	Trade does not benefit all community members equally.
Garlock et al. (2026)	Women's influence	Global seafood sectors	High post-harvest participation; low influence	75% of sectors had male-dominated business decision-making.
Garcia Lozano et al. (2022)	Decent work	Fishery workers	Persistent vulnerabilities	Worker voice and rights are essential to sustainable benefits.
Decker Sparks et al. (2022)	Labour governance	Seafood workers	Voluntary standards may fail	Worker-centred, enforceable mechanisms are needed.
Arthur et al. (2022)	Small-scale livelihoods	Coastal communities	Globalization alters access/benefits	Governance must address unequal access, power and vulnerability.

These findings change how social upgrading should be interpreted. Employment growth is not sufficient if workers lack voice, protection, or pathways into higher-return positions. Likewise, women's high participation in post-harvest activities does not automatically indicate empowerment when business decisions remain male dominated. Distributional analysis should therefore assess participation together with decision influence, remuneration, working conditions, asset access, and the capacity to organize collectively.

Synthesis and Tuna Value Capture Framework

Across the four themes, value capture is relational: actors retain more value when they control strategic functions such as processing, cold chains, finance, information, standards, traceability, and market access. The Kenyan case illustrates this clearly, with processors capturing the highest reported margin despite fishers supplying the resource (Mzingirwa et al., 2025). This pattern is consistent with evidence that infrastructure, institutional quality, and governance shape upgrading opportunities (Efani et al., 2024; Egunjobi & Ngépah, 2022).

The review also shows that efficiency and equity can diverge. Traceability, certification, and digital systems may improve transparency and market access, yet their distributive effects depend on who owns the technology, bears compliance costs, and participates in rule-making (Bharathi S et al., 2025; Costa et al., 2026; Thorpe et al., 2022). Similarly, industrial profitability may be influenced by subsidies and labour arrangements, while gendered participation does not automatically translate into decision-making power (Froment et al., 2025; Campling & Kim, 2025; Barclay et al., 2022; Garlock et al., 2026).

The resulting Tuna Value Capture Framework links five dimensions: actor position, upgrading capability, market power, governance, and social inclusion. Actor position determines access to higher-margin functions; upgrading capability shapes movement into higher-value processes, products, and services; market power influences prices and contract terms; governance structures access rights and compliance burdens; and social

inclusion determines whether workers, women, and small-scale fishers can convert participation into durable benefits.

For policy, the framework implies that interventions should be evaluated by their distributional pathway rather than by aggregate value alone. Cold-chain investment can improve quality, but fisher benefits depend on affordable access and bargaining arrangements; traceability can increase credibility, but premiums or market access must reach actors who bear compliance costs; and local processing can retain more value domestically only when firms and workers possess the capabilities to meet standards and connect with buyers. The evidence therefore supports combined strategies that link infrastructure, finance, producer organization, transparent market information, and inclusive governance rather than isolated technical upgrades (Efani et al., 2024; Bharathi S et al., 2025; Costa et al., 2026; Egunjobi & Ngepah, 2022).

The findings also highlight the need to distinguish economic upgrading from social upgrading. Higher margins or export earnings can coexist with weak labour protection, unequal decision-making, or dependence on public support. In this review, women's importance in processing and trade contrasts with limited recognition and influence, while industrial tuna evidence shows that labour regimes and subsidies shape the conditions under which profits are generated (Barclay et al., 2022; Garlock et al., 2026; Garcia Lozano et al., 2022; Campling & Kim, 2025; Froment et al., 2025). A more complete assessment of tuna value chains should therefore report not only where value is added but also who controls it, who bears risk and compliance costs, and whether participation improves durable livelihood security.

The evidence base remains geographically concentrated and methodologically heterogeneous, limiting direct comparison of actor-level value shares. Future research should standardize value-distribution metrics, distinguish gross revenue from net returns and public transfers, and report gender- and labour-disaggregated outcomes. Comparative studies should test whether local processing, direct marketing, certification, digital traceability, and producer organization actually increase fisher and worker shares after accounting for compliance and capital costs.

KESIMPULAN DAN SARAN

This review of 24 studies shows that value in global tuna chains is captured unevenly according to control over processing, cold chains, finance, market information, standards, traceability, and governance. The Tuna Value Capture Framework explains these outcomes through five interacting dimensions: actor position, upgrading capability, market power, governance, and social inclusion. More equitable tuna economies therefore require local value addition, transparent market information, accessible and interoperable traceability, stronger producer organization, decent work, and meaningful participation by women and small-scale fishers. Future studies should use standardized actor-level value-distribution metrics and distinguish gross revenue from net returns, subsidies, and externalized costs so that ecological sustainability can be evaluated together with distributive performance.

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