



## From Conservation to Commodification? A Comparative Analysis of Quota-Based Fisheries Governance in Indonesia, Iceland, and New Zealand

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### Abstract

**Background:** Quota-based fisheries management aims to reconcile stock conservation with efficient access, yet harvesting entitlements may evolve from public allocations into asset-like interests. International law of the Sea provides conservation frameworks but does not mandate private rights or quota markets. **Methodology** This research employs a qualitative doctrinal-comparative design, combining doctrinal interpretation, content analysis, comparative matrices, and process tracing across UNCLOS 1982, UNFSA 1995, national legislation, policy documents, and literature. **Objectives:** This study examines how international obligations and domestic legal choices regulate the transformation of harvesting rights from conservation instruments into commodity-like economic interests in Indonesia, Iceland, and New Zealand, and identifies regulatory safeguards for Indonesia's Measured Fishing Policy. **Findings:** UNCLOS and UNFSA require science-based conservation, precaution, cooperation, monitoring, and adaptive adjustment, but do not mandate private ownership, transferability, or quota markets. Commodification develops cumulatively through domestic choices concerning exclusivity, security, duration, divisibility, leasing, transferability, capitalisation, and concentration. Iceland and New Zealand demonstrate stronger legal and market commodification while retaining formal public authority over catch limits. Indonesia remains closer to an administrative allocation model, although unequal access to capital, information, infrastructure, contracts, and bureaucratic capacity may generate functional commodification. The Conservation-Commodification Continuum framework shows that each country's position depends on the balance between rights strength, market intensity, access and rent distribution, and State corrective capacity. **Originality/Novelty:** This research develops the Conservation-Commodification Continuum as a multidimensional diagnostic framework integrating international law, property-rights analysis, common-pool resource governance, and Blue Justice. Its theoretical contribution connects international normative dimensions with domestic institutional choices and distributive effects. Its practical contribution formulates conditional, reviewable, transparent, and socially protective regulatory safeguards for Indonesia's Measured Fishing Policy.

**Keywords:** blue justice; harvesting entitlements; measured fishing policy; coastal-state authority; regulatory safeguards



## Abstrak

**Latar Belakang:** Pengelolaan perikanan berbasis kuota bertujuan menyelaraskan konservasi dengan efisiensi akses, namun hak penangkapan dapat berkembang dari alokasi publik menjadi kepentingan ekonomi. Hukum laut internasional memberikan kerangka konservasi tetapi tidak mewajibkan hak privat atau pasar kuota. **Metodologi:** Penelitian ini mengkaji bagaimana kewajiban internasional dan pilihan hukum domestik mengatur transformasi ini di Indonesia, Islandia, dan Selandia Baru, serta mengidentifikasi pengamanan bagi Kebijakan Penangkapan Ikan Terukur Indonesia. **Tujuan:** Penelitian menggunakan desain doktrinal-komparatif kualitatif dengan memadukan penafsiran doktrinal, analisis isi, matriks perbandingan, dan penelusuran proses terhadap UNCLOS 1982, UNFSA 1995, peraturan nasional, dokumen kebijakan, dan literatur. **Temuan:** UNCLOS dan UNFSA mewajibkan konservasi berbasis ilmu pengetahuan, prinsip kehati-hatian, kerja sama, pemantauan, dan penyesuaian adaptif, namun tidak mewajibkan kepemilikan privat, transferabilitas, atau pasar kuota. Komodifikasi berkembang kumulatif melalui pilihan domestik mengenai eksklusivitas, kepastian, jangka waktu, keterbagian, penyewaan, transferabilitas, kapitalisasi, dan konsentrasi. Islandia dan Selandia Baru menunjukkan komodifikasi hukum dan pasar yang lebih kuat. Indonesia tetap pada model alokasi administratif, namun ketimpangan akses terhadap modal, informasi, infrastruktur, kontrak, dan kapasitas birokratis tetap dapat menimbulkan komodifikasi fungsional. **Orisinalitas/Keunikan:** Penelitian ini mengembangkan Conservation-Commodification Continuum sebagai kerangka diagnostik multidimensi yang mengintegrasikan hukum internasional, analisis hak properti, tata kelola sumber daya bersama, dan Keadilan Biru, serta merumuskan pengamanan regulasi bagi Kebijakan Penangkapan Ikan Terukur Indonesia.

**Kata Kunci:** keadilan biru; hak penangkapan; kebijakan penangkapan ikan terukur; kewenangan negara pantai; pengamanan

## A. Introduction

Fish stocks are common-pool resources: extraction by one user reduces availability for others, while exclusion is often difficult.<sup>1</sup> The Gordon–Scott framework shows that open access encourages excessive effort, dissipates economic rents, and drives exploitation away from economically optimal levels.<sup>2</sup> Technological advances can intensify this pressure when regulation fails to respond to increasing catchability.<sup>3</sup> Hardin links this outcome to the pursuit of short-term individual gains, whereas Ostrom shows that depletion can be avoided through clear boundaries, locally appropriate rules,

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<sup>1</sup> H. Scott Gordon, “The Economic Theory of a Common-Property Resource: The Fishery,” *Journal of Political Economy* 62, no. 2 (1954): 124–142, <https://doi.org/10.1086/257497>; C. Dustin Becker and Elinor Ostrom, “Human Ecology and Resource Sustainability: The Importance of Institutional Diversity,” *Annual Review of Ecology and Systematics* 26, no. 1 (1995): 113–133, <https://doi.org/10.1146/annurev.es.26.110195.000553>.

<sup>2</sup> Gordon, “The Economic Theory of a Common-Property Resource”; Anthony Scott, “The Fishery: The Objectives of Sole Ownership,” *Journal of Political Economy* 63, no. 2 (1955): 116–124, <https://doi.org/10.1086/257653>.

<sup>3</sup> Ole Ritzau Eigaard et al., “Technological Development and Fisheries Management,” *Reviews in Fisheries Science & Aquaculture* 22, no. 2 (2014): 156–174, <https://doi.org/10.1080/23308249.2014.899557>; Kim Scherrer and Eric Galbraith, “Regulation Strength and Technology Creep Play Key Roles in Global Long-Term Projections of Wild Capture Fisheries,” *ICES Journal of Marine Science* 77, nos. 7–8 (2020): 2518–2528, <https://doi.org/10.1093/icesjms/fsaa109>.

user participation, monitoring, and credible sanctions.<sup>4</sup> Catch quotas are therefore institutional instruments whose effectiveness depends on the design of harvesting rights and their fit with the fishery's ecological, social, and governance conditions.<sup>5</sup>

International fisheries law provides the normative basis for limiting exploitation. UNCLOS grants coastal States sovereign rights to explore, exploit, conserve, and manage living resources in their exclusive economic zones, while imposing continuing conservation and management duties.<sup>6</sup> These rights are functional and jurisdictional rather than territorial and do not independently create private ownership of fish stocks under domestic law.<sup>7</sup> Their exercise must comply with international obligations concerning conservation, scientific decision-making, and cooperation.<sup>8</sup> UNFSA further requires States Parties to use the best available scientific evidence, apply the precautionary approach, ensure compatible measures, and establish effective monitoring, control, surveillance, compliance, and enforcement systems.<sup>9</sup> The FAO Code of Conduct for Responsible Fisheries and the FAO Small-Scale Fisheries Guidelines complement these binding rules by promoting responsible management, participation,

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<sup>4</sup> Garrett Hardin, "The Tragedy of the Commons," *Science* 162, no. 3859 (1968): 1243–1248, <https://doi.org/10.1126/science.162.3859.1243>; Michael Cox et al., "A Review of Design Principles for Community-Based Natural Resource Management," *Ecology and Society* 15, no. 4 (2010): art38, <https://doi.org/10.5751/ES-03704-150438>; Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action*, The Political Economy of Institutions and Decisions (Cambridge University Press, 1990).

<sup>5</sup> Michael C. Melnychuk et al., "Which Design Elements of Individual Quota Fisheries Help to Achieve Management Objectives?," *Fish and Fisheries* 17, no. 1 (2014): 126–142, <https://doi.org/10.1111/faf.12094>; Eriko Hoshino et al., "Individual Transferable Quotas in Achieving Multiple Objectives of Fisheries Management," *Marine Policy* 113 (March 2020): 103744, <https://doi.org/10.1016/j.marpol.2019.103744>.

<sup>6</sup> Articles 56(1)(a), 61–62 United Nations Convention on the Law of the Sea, 1833 United Nations Treaty Series 3 (1982), [https://www.un.org/depts/los/convention\\_agreements/texts/unclos/UNCLOS-TOC.htm](https://www.un.org/depts/los/convention_agreements/texts/unclos/UNCLOS-TOC.htm); Anita Dian Eka Kusuma and Akbar Kurnia Putra, "The Role of UNCLOS 1982 in Maintaining and Protecting the International Marine Environment," *Lampung Journal of International Law* 6, no. 1 (2024): 21–30, <https://doi.org/10.25041/lajil.v6i1.3379>.

<sup>7</sup> Rolf Einar Fife, "Obligations of 'Due Regard' in the Exclusive Economic Zone: Their Context, Purpose and State Practice," *The International Journal of Marine and Coastal Law* 34, no. 1 (2019): 43–55, <https://doi.org/10.1163/15718085-12341047>; Zhen Sun, *Finding a Balance in the Exclusive Economic Zone: Conflict and Stability in the Law of the Sea*, 1st ed. (Cambridge University Press, 2025), <https://doi.org/10.1017/9781009471329>.

<sup>8</sup> Articles 56(2), 61, 63–64 United Nations Convention on the Law of the Sea.

<sup>9</sup> Articles 3, 5–7, 10, 18–21 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, 2167 United Nations Fish Stocks Agreement 3 (1995), <https://www.un.org/oceancapacity/UNFSA>; Mervin Ogawa and Joseph A. L. Reyes, "Assessment of Regional Fisheries Management Organizations Efforts Toward the Precautionary Approach and Science-Based Stock Management and Compliance Measures," *Sustainability* 13, no. 15 (2021): 8128, <https://doi.org/10.3390/su13158128>.

equity, and protection of small-scale fisheries.<sup>10</sup> Sustainable Development Goal 14 (SDGs 14) similarly calls for effective harvest regulation, science-based management, small-scale fishers' access to resources and markets, and implementation of international law as reflected in UNCLOS.<sup>11</sup> None of these instruments requires States to implement conservation through private-property rights, tradable quotas, or another specific market model. Domestic law therefore determines whether quotas remain conditional administrative controls or become economically valuable and exchangeable harvesting entitlements. Such entitlements are legally constructed interests, not forms of ownership equivalent to the coastal State's sovereign rights, and cannot displace its duties concerning conservation, allocation, supervision, and equitable access.

Quota-based management emerged to replace unrestricted competition with rights to harvest defined shares of a total allowable catch.<sup>12</sup> A quota's legal character depends not only on the allocation itself but also on its exclusivity, security, duration, divisibility, and transferability.<sup>13</sup> Domestic legislation defines these attributes and determines how access is distributed among private, collective, and community actors. Where quotas are long-term, secure, divisible, and transferable, they may acquire market prices and generate rents independently of actual fishing activity.<sup>14</sup>

Stronger quota rights may encourage long-term investment and stewardship, but regulatory compliance still depends on effective monitoring, enforcement, and

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<sup>10</sup> Articles 1.1, 6.1, 6.13, 6.16, 6.18 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks; Food and Agriculture Organization of the United Nations, *Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication*, Voluntary international guidelines nos. 978-92-5-108704-6 (Food and Agriculture Organization of the United Nations, 2015), <https://openknowledge.fao.org/handle/20.500.14283/i4356en>; Julia Nakamura, "Legal Reflections on the Small-Scale Fisheries Guidelines: Building a Global Safety Net for Small-Scale Fisheries," *The International Journal of Marine and Coastal Law* 37, no. 1 (2022): 31–72, <https://doi.org/10.1163/15718085-bja10081>.

<sup>11</sup> Targets 14.4, 14.b, 14.c United Nations General Assembly, *Transforming Our World: The 2030 Agenda for Sustainable Development*, United Nations General Assembly resolution A/RES/70/1 (United Nations, 2015), <https://sdgs.un.org/2030agenda>.

<sup>12</sup> Kevern L. Cochrane and Serge-Michel García, *A Fishery Manager's Guidebook, Management Measures and Their Application*, 2nd ed, with Organisation des Nations Unies pour l'alimentation et l'agriculture (Wiley-Blackwell FAO, 2009).

<sup>13</sup> Edella Schlager and Elinor Ostrom, "Property-Rights Regimes and Natural Resources: A Conceptual Analysis," *Land Economics* 68, no. 3 (1992): 249, <https://doi.org/10.2307/3146375>; Melnychuk et al., "Which Design Elements of Individual Quota Fisheries Help to Achieve Management Objectives?"; Adam L. Ayers and Hing L. Chan, "Rights-Based Management, Competition, and Distributional Equity in Hawai'i's Largest Commercial Fishery," *International Journal of the Commons* 14, no. 1 (2020): 262–277, <https://doi.org/10.5334/ijc.996>.

<sup>14</sup> Richard G. Newell et al., "Asset Pricing in Created Markets," *American Journal of Agricultural Economics* 89, no. 2 (2007): 259–272, <https://doi.org/10.1111/j.1467-8276.2007.01018.x>; Corbett A. Grainger and Christopher J. Costello, "Capitalizing Property Rights Insecurity in Natural Resource Assets," *Journal of Environmental Economics and Management* 67, no. 2 (2014): 224–240, <https://doi.org/10.1016/j.jeem.2013.12.005>; Daniel S. Holland et al., "Impact of Catch Shares on Diversification of Fishers' Income and Risk," *Proceedings of the National Academy of Sciences* 114, no. 35 (2017): 9302–9307, <https://doi.org/10.1073/pnas.1702382114>.

accountability.<sup>15</sup> Transferable quotas may also separate ownership from fishing labour and direct economic benefits towards quota owners, vessel owners, processors, or intermediaries. Lease-dependent fishers, in contrast, may bear additional access costs.<sup>16</sup> Quota systems must therefore be assessed not only by their ability to limit catches but also by how domestic law creates, distributes, and restricts property-rights attributes. The central issue is how these arrangements affect conservation, rent distribution, coastal-community access, and governance legitimacy within the continuing framework of coastal-State authority.

Early research presented catch shares and individual transferable quotas mainly as solutions to open-access incentives and the race to fish.<sup>17</sup> New Zealand and Iceland became influential examples because long-term transferable rights increased operational flexibility and supported valuable quota markets, although their conservation performance still depended on effective catch limits and regulatory institutions.<sup>18</sup> This literature largely prioritised economic efficiency and stock outcomes, giving less attention to the legal, social, and distributional effects of transforming harvesting privileges into asset-like interests. Later studies examined initial allocation, tenure security, transferability, enforcement, and institutional fit, but often treated market formation, property-rights design, and asset valuation separately.<sup>19</sup> The legal process through which conservation allocations acquire asset-like characteristics therefore remains insufficiently integrated into quota-governance analysis.

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<sup>15</sup> Grainger and Costello, "Capitalizing Property Rights Insecurity in Natural Resource Assets"; Manuel Bellanger et al., "Incentive Effect of Joint and Several Liability in Fishery Cooperatives on Regulatory Compliance," *Fish and Fisheries* 20, no. 4 (2019): 715–728, <https://doi.org/10.1111/faf.12372>; Melnychuk et al., "Which Design Elements of Individual Quota Fisheries Help to Achieve Management Objectives?"

<sup>16</sup> Sylvia Brandt and Ning Ding, "Impact of Property Rights on Labor Contracts in Commercial Fisheries," *Ocean & Coastal Management* 51, no. 11 (2008): 740–748, <https://doi.org/10.1016/j.ocecoaman.2008.07.008>; Holland et al., "Impact of Catch Shares on Diversification of Fishers' Income and Risk"; Danielle N. Edwards and Evelyn Pinkerton, "The Hidden Role of Processors in an Individual Transferable Quota Fishery," *Ecology and Society* 24, no. 3 (2019), <https://doi.org/10.5751/es-11148-240336>.

<sup>17</sup> Christopher M. Dewees, "Effects of Individual Quota Systems on New Zealand and British Columbia Fisheries," *Ecological Applications* 8, no. sp1 (1998): S133–38, [https://doi.org/10.1890/1051-0761\(1998\)8%5BS133:EOIQSO%5D2.0.CO;2](https://doi.org/10.1890/1051-0761(1998)8%5BS133:EOIQSO%5D2.0.CO;2); R. Quentin Grafton, "Individual Transferable Quotas: Theory and Practice," *Reviews in Fish Biology and Fisheries* 6, no. 1 (1996): 5–20, <https://doi.org/10.1007/BF00058517>.

<sup>18</sup> Christopher M. Dewees, "Assessment of the Implementation of Individual Transferable Quotas in New Zealand's Inshore Fishery," *North American Journal of Fisheries Management* 9, no. 2 (1989): 131–139, [https://doi.org/10.1577/1548-8675\(1989\)009%3C0131:AOTIOI%3E2.3.CO;2](https://doi.org/10.1577/1548-8675(1989)009%3C0131:AOTIOI%3E2.3.CO;2); Richard G. Newell et al., "Fishing Quota Markets," *Journal of Environmental Economics and Management* 49, no. 3 (2005): 437–462, <https://doi.org/10.1016/j.jeem.2004.06.005>; Ragnar Arnason, "Property Rights in Fisheries: Iceland's Experience with ITQs," *Reviews in Fish Biology and Fisheries* 15, no. 3 (2005): 243–64, <https://doi.org/10.1007/s11160-005-5139-6>.

<sup>19</sup> John Lynham, "How Have Catch Shares Been Allocated?," *Marine Policy* 44 (2014): 42–48, <https://doi.org/10.1016/j.marpol.2013.08.007>; Grainger and Costello, "Capitalizing Property Rights Insecurity in Natural Resource Assets"; Melnychuk et al., "Which Design Elements of Individual Quota Fisheries Help to Achieve Management Objectives?"

Recent research has expanded the analysis to rent distribution, ownership concentration, lease markets, processor dominance, and coastal-community resilience.<sup>20</sup> Iceland shows how transferability can consolidate harvesting rights and reshape fishing settlements, while New Zealand's separation of permanent quota ownership from Annual Catch Entitlement improves market liquidity but may increase fishers' dependence on quota holders and processing companies.<sup>21</sup> Blue Justice scholarship further evaluates quota regimes through distributive, procedural, and recognitional justice, especially for small-scale fishers, Indigenous peoples, fisheries workers, and coastal communities.<sup>22</sup> Yet the relevant fields remain fragmented, law-of-the-sea scholarship focuses on sovereign rights and conservation duties, fisheries economics on efficiency, property-rights research on quota value, and Blue Justice on social consequences. As a result, the relationship among international obligations, domestic quota design, market development, control concentration, and social safeguards remains underdeveloped.

This study addresses that gap by examining how international obligations and domestic law regulate the relationship between coastal-State authority and quota entitlements that may evolve from conservation controls into commodity-like interests. It compares Indonesia, Iceland, and New Zealand and analyses how exclusivity, security, duration, divisibility, and transferability influence lease markets, asset valuation, ownership concentration, and the separation of harvesting rights from fishing activity. It gives particular attention to Indonesia's Measured Fishing Policy under Government Regulation No. 11 of 2023 and Ministerial Regulation No. 28 of 2023, assessing the safeguards needed to preserve the public function of fishery resources, prevent excessive control concentration, and protect small-scale fishers. The study develops the Conservation-Commodification Continuum as a legal-regulatory framework for evaluating the strength of harvesting rights, market transferability and dominance,

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<sup>20</sup> Edwards and Pinkerton, "The Hidden Role of Processors in an Individual Transferable Quota Fishery"; Joshua K. Abbott et al., "The Distributional Outcomes of Rights-Based Management in Fisheries," *Proceedings of the National Academy of Sciences* 119, no. 2 (2022), <https://doi.org/10.1073/pnas.2109154119>.

<sup>21</sup> Catherine Chambers et al., "Little Kings': Community, Change and Conflict in Icelandic Fisheries," *Maritime Studies* 16, no. 1 (2017): 10, <https://doi.org/10.1186/s40152-017-0064-6>; Kristinn N. Edvardsson et al., "Mapping the Geographical Consolidation of Fishing Activities in Iceland During the Maturation of the ITQ Fisheries Management System," *Applied Geography* 97 (2018): 85–97, <https://doi.org/10.1016/j.apgeog.2018.05.013>; Matthias Kokorsch and Karl Benediktsson, "Prosper or Perish? The Development of Icelandic Fishing Villages After the Privatisation of Fishing Rights," *Maritime Studies* 17, no. 1 (2018): 69–83, <https://doi.org/10.1007/s40152-018-0089-5>; Paul Marchal et al., "A Comparative Review of Fisheries Management Experiences in the European Union and in Other Countries Worldwide: Iceland, Australia, and New Zealand," *Fish and Fisheries* 17, no. 3 (2016): 803–824, <https://doi.org/10.1111/faf.12147>; Hekia Bodwitch, "Challenges for New Zealand's Individual Transferable Quota System: Processor Consolidation, Fisher Exclusion, & Māori Quota Rights," *Marine Policy* 80 (2017): 88–95, <https://doi.org/10.1016/j.marpol.2016.11.030>.

<sup>22</sup> Sigrid Engen et al., "Blue Justice: A Survey for Eliciting Perceptions of Environmental Justice Among Coastal Planners' and Small-Scale Fishers in Northern-Norway," *Plos One* 16, no. 5 (2021): e0251467, <https://doi.org/10.1371/journal.pone.0251467>; Jessica Blythe et al., "Blue Justice: A Review of Emerging Scholarship and Resistance Movements," *Cambridge Prisms Coastal Futures* 1 (2023), <https://doi.org/10.1017/cft.2023.4>; Nathan James Bennett et al., "Blue Growth and Blue Justice: Ten Risks and Solutions for the Ocean Economy," *Marine Policy* 125 (March 2021): 104387, <https://doi.org/10.1016/j.marpol.2020.104387>.

access and rent distribution, and the State's capacity to maintain social and ecological safeguards. Rather than assuming a linear shift towards privatisation, the framework assesses whether quotas remain conditional public-law instruments or become entrenched economic interests that constrain regulatory adaptation, create lease dependency, and weaken the public character of fishery resources. This study uses a qualitative doctrinal-comparative legal design based on primary and secondary documentary materials. It examines the relationship among international legal obligations, the legal attributes of catch quotas, domestic regulatory frameworks, and documented distributive effects.<sup>23</sup> Materials were purposively selected through documentary research and included binding international instruments, soft-law frameworks, national legislation and regulations, judicial decisions, and relevant academic literature.<sup>24</sup> They were classified by jurisdiction, normative status, and regulatory theme. Doctrinal analysis was used to interpret their hierarchy, scope, and normative relationships, while qualitative content analysis identified recurring textual and regulatory patterns.<sup>25</sup> Process tracing reconstructed whether, and through which legal-institutional sequences, quota-based conservation measures developed into transferable harvesting entitlements.<sup>26</sup> The documents were then thematically coded to identify recurring patterns in the regulation of harvesting rights. The coded findings were organised into a comparative matrix using common analytical categories.<sup>27</sup> This matrix provided the basis for comparing the quota regimes of Indonesia, Iceland, and New Zealand

## B. Discussion

### 1. International and Comparative Legal Architecture of Quota-Based Fisheries

Quota-based fisheries systems are, in essence, legal constructs that link the state's authority to manage fishery resources with conservation obligations, the use of scientific evidence, and the regulation of access to fishing opportunities. Indonesia, Iceland, and New Zealand all employ catch limits and quota-allocation mechanisms, yet each jurisdiction structures the relationship between scientific advice, the determination of total allowable catch (TAC), quota adjustment, monitoring systems, and fishing rights in different ways.<sup>28</sup> These differences in regulatory design cannot be assessed solely by

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<sup>23</sup> Achmad Irwan Hamzani et al., "Implementation Approach in Legal Research," *International Journal of Advances in Applied Sciences* 13, no. 2 (2024): 380, <https://doi.org/10.11591/ijaas.v13.i2.pp380-388>; Mark Van Hoecke, "Methodology of Comparative Legal Research," *Recht En Methode in Onderzoek En Onderwijs*, ahead of print, December 2015, <https://doi.org/10.5553/REM/000010>.

<sup>24</sup> Glenn A. Bowen, "Document Analysis as a Qualitative Research Method," *Qualitative Research Journal* 9, no. 2 (2009): 27–40, <https://doi.org/10.3316/QRJ0902027>.

<sup>25</sup> Maryam Salehijam, "The Value of Systematic Content Analysis in Legal Research," *Tilburg Law Review* 23, nos. 1–2 (2018): 34–42, <https://doi.org/10.5334/tlr.5>.

<sup>26</sup> David Collier, "Understanding Process Tracing," *PS: Political Science & Politics* 44, no. 4 (2011): 823–830, <https://doi.org/10.1017/S1049096511001429>.

<sup>27</sup> Virginia Braun and Victoria Clarke, *Thematic Analysis: A Practical Guide* (Sage, 2022).

<sup>28</sup> Government Regulation No. 11 of 2023 Concerning Measured Fishing (2023); Ministerial Regulation No. 28 of 2023 Concerning the Implementing Regulation of Government Regulation No. 11 of 2023 Concerning Measured Fishing (2023); Act No. 116/2006 on Fisheries Management (Lög Um Stjórn Fiskveiða) (2006); Fisheries Act 1996 (1996).

comparing the instruments adopted; they must also be situated within the appropriate normative hierarchy. In this regard, UNCLOS and, within the scope defined in Article 3, the UNFSA establish binding legal obligations for their States Parties, whereas the FAO Code of Conduct for Responsible Fisheries and related voluntary guidelines primarily provide non-binding policy guidance, notwithstanding that some of their provisions reflect existing rules of international law. Accordingly, a comparative analysis should not be confined to determining whether TACs, individual quotas, or transferability mechanisms exist, but should also examine how stock assessments are translated into catch limits, how quotas are adjusted in response to changes in resource conditions, and how these mechanisms are supported by effective monitoring and enforcement.

Within the international legal framework, Articles 56, 61, and 62 of UNCLOS recognise the sovereign rights of coastal States over living resources in the exclusive economic zone. The exercise of these rights is accompanied by obligations to determine the allowable catch, rely on the best scientific evidence available, maintain or restore fish stocks, exchange relevant information, and promote optimum utilisation consistent with conservation requirements.<sup>29</sup> With respect to straddling fish stocks and highly migratory fish stocks, Articles 5 and 6 of the UNFSA impose additional obligations to apply the precautionary approach, ensure the compatibility of management measures, collect data, and implement effective monitoring and enforcement. The UNFSA further requires States to take into account the interests of artisanal and subsistence fishers.<sup>30</sup> Accordingly, the comparison of the three countries focuses on the capacity of their domestic legal frameworks to connect catch limits and annual allocations with scientific advice, precaution, monitoring, and cooperation.

The existence of a Total Allowable Catch (TAC) and annual quotas does not, by itself, demonstrate that a State has fulfilled the applicable legal obligations, which also encompass science-based conservation measures, the precautionary approach, data collection, and effective monitoring, control, and surveillance. At the level of legal design, alignment with these obligations depends on a clear relationship between assessments of fish-stock conditions and decisions to establish or revise catch limits.<sup>31</sup> The precautionary approach requires fishery resources to remain protected even when

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<sup>29</sup> Articles 56, 61-62 United Nations Convention on the Law of the Sea.

<sup>30</sup> Articles 3, 5-7 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks.

<sup>31</sup> Articles 61 (1)-(3) United Nations Convention on the Law of the Sea; Articles 5(b), 6(3)(b), 6(4-[5] Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks.

scientific information is uncertain, unreliable, or inadequate.<sup>32</sup> This requires target and limit reference points, together with pre-agreed harvest control rules specifying when catch levels should be reduced or maintained and when stock-rebuilding measures should be initiated.<sup>33</sup> Monitoring, control, surveillance, and catch-data verification are also necessary to determine whether catches remain within the established limits. However, because this study relies exclusively on documentary sources, its assessment is confined to the normative alignment of the legal design and is not intended to draw conclusions regarding the level of compliance in practice.

The FAO Code of Conduct for Responsible Fisheries and the FAO Small-Scale Fisheries Guidelines occupy a normative position distinct from that of binding international agreements.<sup>34</sup> Although neither instrument is legally binding as such, taken together they articulate policy standards concerning the precautionary approach, participation, transparency, livelihood protection, and equitable access to fisheries resources. These standards may influence normative interpretation, facilitate institutional learning, and strengthen the legitimacy of State practice.<sup>35</sup> Accordingly, failure to fulfil the distributive aspirations expressed in these instruments does not, solely by virtue of their non-binding status, automatically establish a violation of UNCLOS or the UNFSA. Such failure may nevertheless indicate a legitimacy deficit or weaknesses in policy implementation and may raise human rights concerns where the resulting measures have serious consequences for livelihoods, equality, meaningful participation, or the rights and interests of Indigenous peoples. This distinction demonstrates that international fisheries law requires States to pursue conservation and cooperation, but leaves the choice of

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<sup>32</sup> Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks; Food and Agriculture Organization of the United Nations, *Precautionary Approach to Capture Fisheries and Species Introductions*, nos. 92-5-103915-1, FAO Technical Guidelines for Responsible Fisheries (Food and Agriculture Organization of the United Nations, 1996), 1-54, <https://www.fao.org/4/w3592e/w3592e00.htm>; Tobias K. Mildenberger et al., "Implementing the Precautionary Approach into Fisheries Management: Biomass Reference Points and Uncertainty Buffers," *Fish and Fisheries* 23, no. 1 (2022): 73-92, <https://doi.org/10.1111/faf.12599>.

<sup>33</sup> S. M. Garcia, "The Precautionary Approach To Fisheries And Its Implications For Fishery Research, Technology And Management: And Updated Review," accessed October 30, 2025, <https://www.fao.org/4/w1238e/W1238E01.htm#ch1.1.1>; Sturla F. Kvamsdal et al., "Harvest Control Rules in Modern Fisheries Management," *Elementa: Science of the Anthropocene* 4 (January 2016): 000114, <https://doi.org/10.12952/journal.elementa.000114>.

<sup>34</sup> Food and Agriculture Organization of the United Nations, *Code of Conduct for Responsible Fisheries*, International voluntary instrument nos. 92-5-103834-1 (Food and Agriculture Organization of the United Nations, 1995), 41, <https://openknowledge.fao.org/items/89b84fe5-1598-40f9-9e95-a050fbb730c8>; Food and Agriculture Organization of the United Nations, *Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication*; Nakamura, "Legal Reflections on the Small-Scale Fisheries Guidelines: Building a Global Safety Net for Small-Scale Fisheries."

<sup>35</sup> Sylvia Karlsson-Vinkhuyzen and Antto Vihma, "Comparing the Legitimacy and Effectiveness of Global Hard and Soft Law: An Analytical Framework," *Regulation & Governance* 3, no. 4 (2009): 400-420, <https://doi.org/10.1111/j.1748-5991.2009.01062.x>; Gregory C. Shaffer and Mark A. Pollack, "Hard Vs. Soft Law: Alternatives, Complements, and Antagonists in International Governance," *Minnesota Law Review* 94, no. 3 (2010): 706, <https://doi.org/10.24926/265535.1391>; Lene Korseberg, "The Law-Making Effects of the Fao Deep-Sea Fisheries Guidelines," *International and Comparative Law Quarterly* 67, no. 4 (2018): 801-832, <https://doi.org/10.1017/s0020589318000192>.

domestic access and allocation regimes to national law and therefore does not mandate the privatisation of fishing rights or the establishment of quota markets.

Within the framework of these international obligations, States retain broad discretion to determine the form and distribution of fishing rights. Common-pool resource theory evaluates the quality of governance by reference to several factors, including clearly defined resource and user boundaries, the congruence of rules with local conditions, user participation, effective monitoring, and credible sanctions.<sup>36</sup> Property-rights theory, by contrast, explains that catch allocations may come to resemble assets when the rights concerned are exclusive, secure, long-term, divisible, and transferable.<sup>37</sup> These characteristics may provide greater certainty for planning and investment, but their adoption is not required by either UNCLOS or the UNFSA. Moreover, strengthening the asset-like qualities of private fishing rights does not transform them into the sovereign rights held by coastal States. On this basis, the analysis distinguishes compliance with international conservation obligations from domestic policy choices concerning the extent to which access rights are strengthened, traded, or distributed.

Iceland's fisheries law establishes a relatively clear relationship between scientific advice, the determination of catch limits, and the allocation of annual quotas. Article 1 of Act No. 116/2006<sup>38</sup> provides that exploitable marine stocks are the common property of the Icelandic nation. It further clarifies that fishing rights allocated to operators do not constitute absolute and irrevocable property rights. Article 3 subsequently requires the Minister to determine the Total Allowable Catch (TAC) for each stock on the basis of recommendations issued by the Marine and Freshwater Research Institute. For certain stocks, catch advice is formulated through harvest control rules that link the biological condition of the stock to the recommended level of catch.<sup>39</sup> Under Article 8, long-term quota shares (*aflahlutdeild*) are used to determine annual catch entitlements (*aflamark*) as a proportion of the TAC. Quota shares and annual catch entitlements may be transferred pursuant to Articles 12 and 15, while Articles 13 and 14 impose limits on their concentration. The system therefore creates a traceable sequence from scientific advice to the determination of the TAC and, ultimately, the allocation of annual quotas. Nevertheless, the clarity of this legal design does not establish that every decision adopted in practice necessarily complies with applicable conservation obligations.

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<sup>36</sup> Elinor Ostrom, "Institutions and the Environment," *Economic Affairs* 28, no. 3 (2008): 24–31, <https://doi.org/10.1111/j.1468-0270.2008.00840.x>; Cox et al., "A Review of Design Principles for Community-Based Natural Resource Management"; James A. Wilson, "Matching Social and Ecological Systems in Complex Ocean Fisheries," *Ecology and Society* 11, no. 1 (2006), <https://doi.org/10.5751/es-01628-110109>.

<sup>37</sup> Schlager and Ostrom, "Property-Rights Regimes and Natural Resources"; Christine Stewart, "Legislating for Property Rights in Fisheries," Food and Agriculture Organization of the United Nations, 2004, <https://www.fao.org/4/y5672e/y5672e00.htm>.

<sup>38</sup> Act No. 116/2006 on Fisheries Management (Lög Um Stjórn Fiskveiða).

<sup>39</sup> Marine and Freshwater Research Institute, *Cod—Gadus Morhua: Advice for the 2026/2027 Fishing Year* (Marine and Freshwater Research Institute, 2026), [https://www.hafogvatn.is/static/extras/images/1\\_cod\\_2026\\_1\\_advice\\_en.html](https://www.hafogvatn.is/static/extras/images/1_cod_2026_1_advice_en.html).

Although transferable, fishing rights in Iceland remain rights created under domestic law and dependent upon State authority. They do not diminish the sovereign rights of the coastal State or the government's authority to reduce the TAC. In practice, however, the transferability, high economic value, and concentration of quotas among a limited number of companies may make policy reform more difficult. Once quota values have been incorporated into corporate assets, financing arrangements, and community expectations, reductions in the TAC or the redistribution of quotas may generate substantial political and economic costs, even though such measures remain legally permissible.<sup>40</sup> The central concern is not that the State has lost its legal authority, but that its practical room for policy adjustment may become more constrained. From a Blue Justice perspective, the continued existence of public authority does not necessarily prevent rent concentration, the spatial redistribution of fishing activity, or declining access for small-vessel fishers.

New Zealand establishes a particularly explicit legal and policy relationship between scientific information, the precautionary approach, catch limits, and annual fishing entitlements. Sections 9 and 10 of the Fisheries Act 1996<sup>41</sup> require the government to apply environmental principles and use the best available information while also taking scientific uncertainty into account. Section 13 then links the setting or variation of the Total Allowable Catch (TAC) to stock levels capable of producing the maximum sustainable yield. These statutory requirements are further operationalised through the Harvest Strategy Standard, which employs target reference points, soft limits, hard limits, and harvest control rules to determine when exploitation rates should be reduced and when stock-rebuilding measures should be initiated, although the Standard remains an administrative policy instrument. Sections 42 and 43 define quota as a proportional share of a stock, while Section 66 converts that share into Annual Catch Entitlement (ACE) on the basis of the Total Allowable Commercial Catch. Quota shares and ACE may be transferred separately under Sections 132 and 133, whereas Section 59 limits the amount of quota that may be held by a single person. This design enables the government to adjust annual catch levels without extinguishing the underlying quota share.

Market flexibility within the New Zealand system also separates the roles of quota owners, ACE lessees, active fishers, and fish-processing companies. Although ACE facilitates year-to-year adjustments in fishing entitlements, quota holders and processing companies may continue to influence access costs, financing, landing arrangements, and marketing. Formal quota ownership therefore does not necessarily reveal who exercises

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<sup>40</sup> Chambers et al., "Little Kings"; Edvardsson et al., "Mapping the Geographical Consolidation of Fishing Activities in Iceland During the Maturation of the ITQ Fisheries Management System"; Kokorsch and Benediktsson, "Prosper or Perish? The Development of Icelandic Fishing Villages After the Privatisation of Fishing Rights"; Julia G. Mason et al., "Climate Resilience and Risks of Rigidity Traps in Iceland's Fisheries," *Ambio* 52, no. 8 (2023): 1314–1326, <https://doi.org/10.1007/s13280-023-01859-8>.

<sup>41</sup> Fisheries Act 1996.

effective economic control over fishing operations.<sup>42</sup> Māori commercial fishing interests are recognised through the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992, Section 44 of the Fisheries Act 1996, and the Māori Fisheries Act 2004.<sup>43</sup> Because these arrangements predate the adoption of the United Nations Declaration on the Rights of Indigenous Peoples in 2007, they cannot be regarded as a direct implementation of that Declaration. Nevertheless, their substance is consistent with the development of international norms concerning participation, institutions, livelihood protection, and Indigenous peoples' relationships with natural resources.<sup>44</sup> Accordingly, legal recognition of Māori interests should not be assessed solely by reference to the existence of formal rules, but also in light of quota-leasing arrangements, iwi governance, the practical capacity to engage in fishing, and the distribution of economic benefits.<sup>45</sup>

Unlike New Zealand, which separates long-term quota shares from annual fishing entitlements through ACE, Indonesia continues to situate quota allocation within a licensing and catch-control framework. The Measured Fishing Policy constitutes a form of output control because it limits catches through aggregate catch limits and quota allocations. Government Regulation No. 11 of 2023 requires quotas to be calculated on the basis of fishery resource potential, the allowable catch, and the level of resource utilisation. These requirements are further elaborated in Minister of Marine Affairs and Fisheries Regulation No. 28 of 2023, which provides that the allowable catch may be determined by the Minister or based on decisions adopted by a regional fisheries management organisation. Where no allowable catch has yet been established, it may be determined using historical catch data, subject to the precautionary principle and with the involvement of public authorities, universities, and experts.<sup>46</sup>

The Regulation also governs quota applications, the issuance of quota certificates, and the conditional transfer of unused quotas allocated to industrial operators and local fishers. Unlike Iceland and New Zealand, however, Indonesia has not established long-term quota shares or annual entitlements that exist as separate assets comparable to ACE. The instruments examined likewise do not establish a general system of target and limit reference points for each stock, accompanied by legal triggers that automatically guide adjustments to catch levels. Indonesia has therefore incorporated scientific

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<sup>42</sup> Bodwitch, "Challenges for New Zealand's Individual Transferable Quota System: Processor Consolidation, Fisher Exclusion, & Māori Quota Rights"; Edwards and Pinkerton, "The Hidden Role of Processors in an Individual Transferable Quota Fishery."

<sup>43</sup> Māori Fisheries Act 2004 (2004); Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (1992); Fisheries Act 1996.

<sup>44</sup> United Nations General Assembly, *United Nations Declaration on the Rights of Indigenous Peoples*, A/RES/61/295 (United Nations, 2007), [https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP\\_E\\_web.pdf](https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf).

<sup>45</sup> Michael De Alessi, "The Political Economy of Fishing Rights and Claims: The Maori Experience in New Zealand," *Journal of Agrarian Change* 12, nos. 2–3 (2012): 390–412, <https://doi.org/10.1111/j.1471-0366.2011.00346.x>; Fiona McCormack, "Māori Saltwater Commons," *Commoning Ethnography* 1, no. 1 (2018): 9–31, <https://doi.org/10.26686/ce.v1i1.5203>.

<sup>46</sup> Government Regulation No. 11 of 2023 Concerning Measured Fishing; Ministerial Regulation No. 28 of 2023 Concerning the Implementing Regulation of Government Regulation No. 11 of 2023 Concerning Measured Fishing.

considerations and the precautionary principle into its legal design, but only partially, while the existence and effectiveness of stock-specific harvest control rules still require further legal and empirical verification.

**Table 1.** Comparative Matrix of the Formal Alignment of Quota-Regime Design with International Legal Benchmarks

| <b>Legal benchmark</b>                                                                                 | <b>Iceland</b>                                                                                                                                                                         | <b>New Zealand</b>                                                                                                                                                                | <b>Indonesia</b>                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Science-based aggregate catch limits UNCLOS Articles 61–62; UNFSA Article 5(b)</b>                  | <b>Strong formal alignment:</b> Article 3 links the TAC to scientific recommendations; annual catch entitlements are derived from quota shares and the TAC.                            | <b>Strong formal alignment:</b> Sections 10 and 13 of the Fisheries Act link the best available information and MSY-based considerations to TAC decision-making.                  | <b>Partial formalisation:</b> Government Regulation No. 11/2023 and Ministerial Regulation No. 28/2023 link the allowable catch (JTB) and catch quotas to resource potential, utilisation levels, and expert input.                          |
| <b>Precaution, reference points, and harvest control rules UNFSA Article 6 and Annex II</b>            | Stock-specific management plans employ harvest control rules, but their implementation is primarily administrative and is not incorporated into the quota-share provisions themselves. | The Harvest Strategy Standard establishes targets, soft limits, hard limits, and harvest control rules; it constitutes a policy standard that supports statutory decision-making. | The precautionary principle is expressly applied to the determination of certain allowable catches, but the instruments examined do not establish a general framework of stock-specific reference points and pre-agreed adjustment triggers. |
| <b>Monitoring, adaptive capacity, and enforcement UNCLOS Article 61(5); UNFSA Articles 5(j), 18–21</b> | TACs and annual allocations remain adjustable by public authorities; substantive enforcement performance falls outside the scope of this documentary assessment.                       | Annual TACs/TACCs and ACE may be altered while quota shares remain intact; substantive monitoring performance falls outside the scope of this documentary assessment.             | Quota certificates, reporting, reconciliation, and the authority to adjust, reduce, increase, or revoke quotas preserve administrative control; their effectiveness requires empirical evaluation.                                           |
| <b>Cooperation and compatibility for shared</b>                                                        | This cannot be determined solely from national quota legislation; the                                                                                                                  | This cannot be determined solely from national quota                                                                                                                              | Ministerial Regulation No. 28/2023 recognises allowable catches                                                                                                                                                                              |

|                                                                   |                                                                                                                                                                                                |                                                                                                                                                                                  |                                                                                                                                                                                 |
|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>stocks UNCLOS Articles 63–64; UNFSA Articles 7 and 10</b>      | assessment depends on the stocks concerned, RFMO measures, reporting, and State practice.                                                                                                      | legislation; the assessment depends on the stocks concerned, RFMO measures, reporting, and State practice.                                                                       | established by RFMOs and provides for data reconciliation, but compatibility must be assessed against the applicable conservation measures and their actual implementation.     |
| <b>Status of fishing rights and retention of public authority</b> | Transferable quota shares and annual catch entitlements; the legislation rejects their characterisation as property rights or irrevocable control and preserves public authority over the TAC. | Transferable quota shares and separately transferable ACE; the ministerial authority to alter TACs/TACCs is retained.                                                            | Catch quotas tied to licences and certificates, with conditional transferability; the regime does not create long-term quota shares or separately tradable annual entitlements. |
| <b>Equity and access considerations</b>                           | Concentration controls are available, but documented consolidation has generated distributive concerns and challenges for coastal communities.                                                 | Māori settlement rights provide specific recognition within the fisheries sector, but leasing arrangements and the market power of processing companies affect effective access. | Local fisher quotas establish a formal category, but the instruments examined do not, in themselves, demonstrate specific and effective protection for all small-scale fishers. |

**Source:** The author's legal analysis of the instruments and literature discussed in this section.

The matrix demonstrates that Iceland, New Zealand, and Indonesia have all incorporated international fisheries obligations into their domestic legal frameworks, albeit through different regulatory approaches. In Iceland and New Zealand, the relationship between scientific advice, the determination of allowable catch, the precautionary principle, and quota adjustment is regulated more explicitly. Indonesia has likewise linked the allowable catch (JTB) and catch quotas to fishery resource potential, levels of utilisation, expert input, and the precautionary principle. However, the instruments examined have not yet comprehensively established reference points for each fish stock or predefined conditions that would automatically require adjustments to catch levels.

A further distinction concerns the form and transferability of fishing rights. In Iceland and New Zealand, quota shares and annual catch entitlements may be transferred, while the government retains the authority to alter catch limits and related allocations. Indonesia maintains stronger administrative control through licensing, quota certificates,

reporting, data reconciliation, and restricted quota transfers. The Indonesian system has also not established long-term quota shares or separately tradable annual catch entitlements. Nevertheless, the existence of these regulatory arrangements is insufficient to demonstrate that monitoring, enforcement, shared-stock management, and the allocation of access operate effectively and equitably in practice.

Accordingly, the position of each country within the Conservation–Commodification Continuum cannot be assessed solely on the basis of its regulatory provisions. The assessment must distinguish between legal design, practical implementation, and fairness in the distribution of access and economic benefits. The existence of science-based catch limits, authority to adjust quotas, and regulatory control mechanisms indicates a conservation-oriented design. However, these features do not, in themselves, establish that the rules have been effectively implemented or that the benefits derived from fisheries have been distributed equitably.

## **2. Legal Mechanisms Driving the Transition from Conservation to Commodification**

The preceding discussion shows that Indonesia, Iceland, and New Zealand all situate catch limits and quota allocations within a conservation architecture, yet regulate the legal status and mechanisms for exercising fishing rights differently. These differences are significant because formal compliance with conservation obligations does not, in itself, determine who controls access, captures rents, or influences policy adjustment. Quotas may simultaneously constrain extraction and create exclusive economic access. The transition towards commodification should therefore be understood as a sequence of legal and institutional changes, rather than as an automatic consequence of quota implementation or a direct shift towards private property rights.

In this analysis, commodification encompasses two interrelated forms. Legal commodification occurs when national law strengthens the security, duration, divisibility, transferability, leasing, and potential capitalisation of fishing rights. Functional commodification, by contrast, arises when economic control over access is established through contractual arrangements, financing, processing, landing, or intermediation, even where quotas formally remain licences or administrative rights that cannot be freely transferred. In both forms, the object of exchange is not ownership of the fish stock, but the legally recognised opportunity to take a specified share of the authorised catch. The sovereign rights of the coastal State under UNCLOS remain vested in the State, whereas quota rights constitute derivative interests created and limited by national law.

These two forms of commodification develop through a sequence of legal mechanisms. The first stage comprises the closure of open access and the establishment of initial allocations. Within the Gordon–Scott framework, catch restrictions and quota allocation reduce incentives to engage in the race to fish and limit the dissipation of rents caused by

each operator's attempt to outcompete others.<sup>47</sup> Quotas do not, however, guarantee stock sustainability in themselves, because ecological outcomes continue to depend on the accuracy of catch limits, data quality, monitoring, and enforcement.<sup>48</sup> (Sumaila, 2010). At the same time, the initial allocation formula determines which parties first obtain the economic benefits arising from restricted access. Allocations based primarily on catch history may preserve the advantages of incumbent operators and convert pre-existing inequalities in capacity into stronger legal positions.<sup>49</sup> Initial allocation is therefore both a conservation decision and a distributive decision, even where a quota market has not yet emerged at this stage. The second stage involves the stabilisation of fishing rights. Exclusivity determines who is authorised to use an allocation, while security, duration, and the prospect of renewal shape the rights holder's ability to plan investments and anticipate future benefits. The more predictable the continuity of the right, the more readily its future economic value is reflected in business decisions and transaction prices. Evidence across fisheries indicates that the security of rights, the risk of revocation, ownership disputes, and illegal harvesting may be capitalised into both the sale and lease prices of quotas.<sup>50</sup> Security need not, however, produce absolute rights or rights that are immune from review. Legal design may continue to provide for limited duration, compliance conditions, and State authority to adjust the TAC, reduce allocations, or revoke rights where stock conditions and the public interest so require.<sup>51</sup>

The third stage arises when divisibility, transferability, and leasing allow access to be separated from the operator who initially received the allocation. Divisibility permits part of a right to be transferred, while transferability and leasing create markets for quota sales and annual access. The sale price of a quota reflects the present value of the expected future stream of rents, whereas the lease price primarily reflects its use value for a single fishing period.<sup>52</sup> New Zealand illustrates this separation through the relationship between quota shares and Annual Catch Entitlement (ACE), which allows annual fishing entitlements to be traded separately from the underlying long-term quota shares.<sup>53</sup> This structure increases flexibility in adjusting access, but may also strengthen the strategic position of quota owners or processing companies where active fishers

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<sup>47</sup> Gordon, "The Economic Theory of a Common-Property Resource"; Scott, "The Fishery."

<sup>48</sup> U. R. Sumaila, "A Cautionary Note on Individual Transferable Quotas," *Ecology and Society* 15, no. 3 (2010), <https://doi.org/10.5751/es-03391-150336>.

<sup>49</sup> Lynham, "How Have Catch Shares Been Allocated?"; Abbott et al., "The Distributional Outcomes of Rights-Based Management in Fisheries."

<sup>50</sup> Grainger and Costello, "Capitalizing Property Rights Insecurity in Natural Resource Assets."

<sup>51</sup> Ragnar Arnason, "Property Rights in Fisheries: How Much Can Individual Transferable Quotas Accomplish?," *Review of Environmental Economics and Policy* 6, no. 2 (2012): 217–236, <https://doi.org/10.1093/reep/res011>; Adam L. Ayers et al., "Whose Right to Manage? Distribution of Property Rights Affects Equity and Power Dynamics in Comanagement," *Ecology and Society* 23, no. 2 (2018), <https://doi.org/10.5751/es-10124-230237>.

<sup>52</sup> Newell et al., "Fishing Quota Markets"; Newell et al., "Asset Pricing in Created Markets."

<sup>53</sup> Marchal et al., "A Comparative Review of Fisheries Management Experiences in the European Union and in Other Countries Worldwide: Iceland, Australia, and New Zealand."

depend on the ACE market, financing, and marketing channels controlled by those actors.<sup>54</sup>

The distributive consequences of quota markets depend on the structure of capital, information, and power among participants. Market formation does not invariably produce concentration, but transferability may encourage consolidation where participants possess unequal capabilities. Under such conditions, rights tend to move towards actors able to pay the highest price or integrate harvesting with processing and marketing. Iceland's experience shows that quota mobility may detach fishing rights from their association with small vessels and coastal communities and concentrate them in larger, vertically integrated companies.<sup>55</sup> Formal ownership, however, does not always reveal where effective control lies. Processing companies or intermediaries may control access through lease markets, landing contracts, financing, and marketing, even where they are not recorded as owning most of the quota.<sup>56</sup> Assessments of concentration should therefore encompass direct ownership, beneficial ownership, contractual control, and the distribution of rents.

Capitalisation and concentration affect not only the distribution of access and rents but may also constrain the State's adaptive capacity. Legally, an increase in quota value does not remove the government's authority to reduce catch limits or alter allocation arrangements. Where quotas have been incorporated into corporate balance sheets, financing structures, and income expectations, however, policy changes may generate greater economic losses and political resistance. This condition does not signify the disappearance of State authority, but creates the potential for de facto rigidity in its exercise. Studies of Iceland indicate that transferability and catch-balancing mechanisms may support responses to stock changes, while consolidated structures may also create barriers to entry and rigidity traps in the adaptation process.<sup>57</sup> Asset value may therefore enhance operational flexibility at the firm level while narrowing the scope for distributive or structural correction at the policy level.<sup>58</sup>

The risks of concentrated control and regulatory rigidity demonstrate that safeguards must form part of the initial design of rights rather than operate merely as corrective measures after concentration has occurred. Conditional duration and renewal, limits on ownership and control, registration of transfers and leases, disclosure of beneficial ownership, restrictions on affiliated relationships, and periodic review may preserve the State's capacity to correct market outcomes. Distributive safeguards also require

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<sup>54</sup> Bodwitch, "Challenges for New Zealand's Individual Transferable Quota System: Processor Consolidation, Fisher Exclusion, & Māori Quota Rights."

<sup>55</sup> Einar Eythórsson, "A Decade of ITQ-Management in Icelandic Fisheries: Consolidation without Consensus," *Marine Policy* 24, no. 6 (2000): 483–492, [https://doi.org/10.1016/S0308-597X\(00\)00021-X](https://doi.org/10.1016/S0308-597X(00)00021-X); Chambers et al., "Little Kings"; Edvardsson et al., "Mapping the Geographical Consolidation of Fishing Activities in Iceland During the Maturation of the ITQ Fisheries Management System."

<sup>56</sup> Edwards and Pinkerton, "The Hidden Role of Processors in an Individual Transferable Quota Fishery."

<sup>57</sup> Mason et al., "Climate Resilience and Risks of Rigidity Traps in Iceland's Fisheries."

<sup>58</sup> Grainger and Costello, "Capitalizing Property Rights Insecurity in Natural Resource Assets."

transparent allocation criteria, dedicated access for small-scale fishers, recognition of the interests of Indigenous peoples and coastal communities, and accessible objection and administrative review procedures. The literature shows that the distributive outcomes of rights-based regimes depend substantially on the details of allocation, the structure of competition, and the regulatory capacity to oversee indirect forms of control.<sup>59</sup> The Blue Justice framework therefore does not reject all stable or transferable rights, but requires that market efficiency should not displace public functions, equitable access, or ecological adaptive capacity.

This sequence of mechanisms forms a cumulative pathway from conservation control to the stabilisation of rights, market formation, capitalisation, and the concentration of control. Each stage adds new attributes, although not every regime must pass through all of these stages. Each stage may also be constrained or reversed through legal instruments. Table 2 maps these mechanisms and identifies the corresponding points of regulatory intervention.

**Table 2.** Legal-Institutional Pathways from Conservation to Commodification in Quota-Based Fisheries

| <b>Legal-institutional pathway</b> | <b>Core legal design</b>                                                | <b>Legal-economic effect</b>                                                                 | <b>Principal distributive risk and regulatory safeguard</b>                                                                                  |
|------------------------------------|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Conservation control</b>        | Establishment of the Total Allowable Catch and initial quota allocation | Transforms open access into limited harvesting entitlements and constrains total withdrawals | Allocation may privilege established actors; safeguards include transparent allocation criteria, stock assessment, and periodic review       |
| <b>Stabilisation of rights</b>     | Security and duration of quota entitlements                             | Creates durable expectations and may encourage long-term planning and investment             | Existing allocations may become entrenched; safeguards include time limits, compliance review, and retained state authority to adjust rights |
| <b>Market formation</b>            | Divisibility, transferability, and quota leasing                        | Gives harvesting entitlements exchange and rental value and enables access to                | Rights may migrate towards capital-rich actors and create lessee dependency; safeguards include eligibility rules, transfer restrictions,    |

<sup>59</sup> Ayers and Chan, "Rights-Based Management, Competition, and Distributional Equity in Hawai'i's Largest Commercial Fishery"; Bodwitch, "Challenges for New Zealand's Individual Transferable Quota System: Processor Consolidation, Fisher Exclusion, & Māori Quota Rights"; Edwards and Pinkerton, "The Hidden Role of Processors in an Individual Transferable Quota Fishery"; Abbott et al., "The Distributional Outcomes of Rights-Based Management in Fisheries."

|                                       |                                                                                                                          | be transferred<br>between actors                                                                                                  | lease regulation, and<br>transaction registration                                                                                                                                                    |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Asset<br/>formation</b>            | Separation of quota<br>ownership from<br>annual harvesting<br>entitlements, price<br>formation, and<br>collateralisation | Converts expected<br>future rents into<br>capital value and<br>permits ownership<br>without direct<br>participation in<br>fishing | Financialisation and<br>intermediary or<br>processor dominance<br>may emerge; safeguards<br>include beneficial-control<br>disclosure, contractual<br>oversight, and limits on<br>non-fishing control |
| <b>Concentration<br/>of control</b>   | Accumulation of<br>ownership, leasing<br>power, or vertical<br>contractual control                                       | Consolidates<br>effective control<br>over harvesting<br>opportunities<br>among a limited<br>number of actors                      | Small-scale fishers and<br>coastal communities may<br>be excluded; safeguards<br>include ownership or<br>control caps, aggregation<br>limits, and concentration<br>monitoring                        |
| <b>Public-interest<br/>correction</b> | Dedicated<br>allocations,<br>community or<br>Indigenous rights, co-<br>management, and<br>allocation review              | Constrains market-<br>based rights<br>through<br>conservation,<br>social, and<br>distributive<br>objectives                       | Safeguards may remain<br>symbolic without<br>effective access;<br>responses include<br>dedicated quotas,<br>meaningful participation,<br>objection mechanisms,<br>and distributive<br>assessment     |

**Source:** Authors' synthesis based on the literature discussed in this section.

Table 2 shows that each mechanism that increases transactional efficiency also alters the distribution of power over fishery resources. Security and transferability may strengthen conservation incentives, but lease markets, capitalisation, and consolidation shift the centre of benefit from harvesting towards control over rights. Safeguards cannot operate merely as corrective measures after markets have developed; they must be embedded from the stages of initial allocation, rights strengthening, and transaction formation. A regime's position along the conservation–commodification spectrum is ultimately determined by the balance between the marketability of rights and the state's capacity to preserve the public function of fishery resources.

Fishing access is not commodified automatically by international law: UNCLOS and UNFSA establish conservation and cooperation objectives without requiring private rights, transferability, or any particular quota market. The transformation instead arises from domestic legal choices concerning initial allocation, security, duration, divisibility, leasing, transferability, and the degree of tolerance afforded to concentration and indirect control. Co-management and community-based governance regimes demonstrate that access restrictions may also be designed to protect livelihoods and participation without converting harvesting rights into fully transferable market assets. By contrast, the broad

initial distribution of rights does not guarantee justice where rents and contractual power subsequently shift towards capital owners, processing companies, or intermediaries. This discussion establishes that the transition from conservation to commodification is a cumulative institutional process mediated by rights design, market architecture, power relations, and state capacity to preserve equitable access.

### **3. Operationalising the Conservation–Commodification Continuum and Regulatory Safeguards for Indonesia**

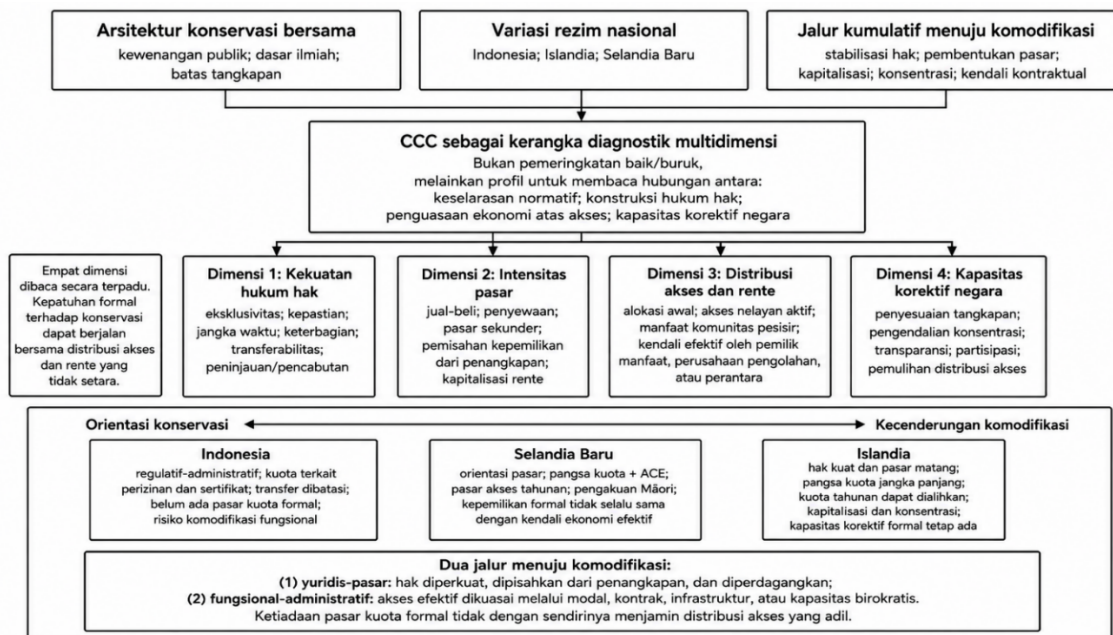
The first subsection demonstrated that Indonesia, Iceland, and New Zealand situate quotas within conservation architectures that preserve public authority, but differ in the manner in which they connect scientific foundations, catch limits, and the legal status of fishing rights. The second subsection subsequently reconstructed the cumulative pathway through which conservation-oriented allocations may be transformed into economic interests through the stabilisation of rights, market formation, capitalisation, concentration, and contractual control. Building on these two findings, the Conservation–Commodification Continuum (CCC) is operationalised in this section as a diagnostic framework linking normative alignment, the legal construction of rights, economic control over access, and the State’s corrective capacity. The CCC is not a linear ranking of good and bad regimes, but a multidimensional profile that explains why formal compliance with conservation obligations may coexist with unequal distributions of access and rents.

The CCC comprises four dimensions that must be interpreted in an integrated manner. The first dimension assesses the legal strength of fishing rights through their exclusivity, security, duration, divisibility, transferability, and susceptibility to review or revocation. The second measures market intensity through sales, leasing, secondary markets, the separation of ownership from fishing activity, and the capitalisation of future rents. The third evaluates the distribution of access and rents, including initial allocation, access for active fishers, benefits for coastal communities, and effective control by beneficial owners, processing companies, or intermediaries. The fourth evaluates the State’s corrective capacity to adjust catches in response to stock conditions, control concentration, ensure transparency and participation, and restore the distribution of access where market outcomes conflict with the public interest.<sup>60</sup>

**Figure 1.** Analytical Structure of the Conservation–Commodification Continuum (CCC) and Its Application to Quota Regimes

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<sup>60</sup> Schlager and Ostrom, “Property-Rights Regimes and Natural Resources”; Melnychuk et al., “Which Design Elements of Individual Quota Fisheries Help to Achieve Management Objectives?”; Abbott et al., “The Distributional Outcomes of Rights-Based Management in Fisheries”; Blythe et al., “Blue Justice: A Review of Emerging Scholarship and Resistance Movements.”



**Source:** Author's synthesis based on Schlager and Ostrom (1992), Melnychuk et al. (2016), Abbott et al. (2022), and Blythe et al. (2023).

Given the limitations of documentary research, the positions of the three countries within the CCC should be understood as relative configurations derived from legal design and secondary evidence, rather than as empirical measurements of compliance or performance. Iceland exhibits a configuration characterised by strong rights and a mature market: long-term quota shares and annual quotas are transferable, while consolidation has shifted a degree of control from small vessels and coastal communities to larger companies. The State retains the authority to establish and reduce the TAC, but capitalisation and concentration may increase the political and economic costs of distributive correction and create risks of adaptive rigidity. Iceland is therefore positioned close to legal and market commodification, while retaining formal corrective capacity through public authority over catch limits.

New Zealand displays a different, although similarly market-oriented, configuration. The separation of long-term quota shares from Annual Catch Entitlement (ACE) creates a liquid annual access market without transforming fish stocks into objects of absolute private ownership. The recognition of Māori fisheries interests constitutes an important layer of legal recognition, but quota ownership does not necessarily guarantee the ability to harvest or capture rents where access to ACE, financing, landing, and marketing is controlled by processing companies. The CCC assessment of New Zealand must therefore distinguish formal ownership from effective economic control.

Indonesia is situated closer to the regulatory-administrative end of the continuum because quotas remain linked to licences and certificates, transfers are restricted by administrative procedures, and the instruments examined have not established permanent quota shares or independent formal leasing markets. This position reduces the degree of legal commodification, but does not eliminate the risk of functional

commodification. Inequalities in capital, information, the capacity to satisfy administrative requirements, financing, landing, processing, and marketing may concentrate benefits among dominant actors even where quota ownership cannot be freely transferred. This conclusion constitutes a regulatory inference drawn from the design of the Measured Fishing Policy and comparative experience, and therefore requires empirical examination once quota implementation is fully operational.

The comparison identifies two pathways towards commodification. The first is a legal-market pathway, under which rights are strengthened, separated from fishing activity, and traded so that rents are capitalised as asset value, as more clearly demonstrated in Iceland and New Zealand. The second is a functional-administrative pathway, under which licences and quotas retain their administrative character, while effective access is controlled through capital, contracts, infrastructure, or bureaucratic capacity. The second pathway is particularly relevant to Indonesia because the absence of a formal quota market does not, in itself, guarantee an equitable distribution of access. Table 3 operationalises the four CCC dimensions by linking the comparative findings to points of regulatory intervention for the Measured Fishing Policy.

**Table 3.** Operationalisation of the CCC Dimensions and Directions for Regulatory Safeguards under the Measured Fishing Policy

| <b>CCC dimension</b>                          | <b>Diagnostic questions and indicators</b>                                                                                         | <b>Comparative configuration</b>                                                                                                                                       | <b>Directions for safeguards under Indonesia's Measured Fishing Policy</b>                                                                                           |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Legal strength of rights</b>               | How exclusive, secure, time-bound, divisible, transferable, and subject to review or revocation are quota rights?                  | Iceland and New Zealand: rights are relatively strong and transferable. Indonesia: rights are administrative, linked to licences, and subject to conditional transfer. | Affirm their administrative status, limited duration, conditional renewal, and the reservation of authority to reduce, suspend, or revoke them.                      |
| <b>Market intensity and effective control</b> | Are there sales, leases, secondary markets, capitalisation, financing arrangements, or control through affiliations and contracts? | Quota and ACE markets are established in Iceland and New Zealand. Indonesia has not established a formal market, but functional control remains possible.              | Register transactions and contracts, disclose beneficial ownership and affiliations, audit financing arrangements, and impose limits on direct and indirect control. |

|                                         |                                                                                                                                                 |                                                                                                                                                                                                        |                                                                                                                                                                                    |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Distribution of access and rents</b> | Who receives the initial allocation, bears access costs, undertakes fishing, and captures rents? Do benefits remain within coastal communities? | Consolidation and dependency on quota owners or processors are documented in market-based regimes. Indonesia's local-fisher quota category is not equivalent to the protection of small-scale fishers. | Establish an effective protected share of access, transparent criteria not based solely on catch history, operational support, participation, and objection procedures.            |
| <b>State corrective capacity</b>        | Can the State adjust JTB/TAC, control concentration, disclose information, enforce compliance, and restore the distribution of access?          | Public authority remains in all three countries, but the effectiveness and costs of correction vary according to rights and market structures.                                                         | Establish stock reference points and harvest-control rules, independent review, public and RFMO reporting, distributive evaluation, credible sanctions, and administrative review. |

**Source:** Author's synthesis based on the legal instruments and literature examined in this study.

The dimensions of rights strength and corrective capacity require the legal status of quotas under the Measured Fishing Policy to be clearly defined. Quotas should be classified as conditional, time-limited, non-permanent, derivative administrative rights that remain subject to reduction, suspension, or revocation on the basis of stock conditions and non-compliance. At least during the initial phase of the Measured Fishing Policy, quotas should not be treated as fixed assets or used as collateral before adequate frameworks for valuation, financing transparency, and public-interest correction are established. Operational certainty remains necessary, but renewal should depend on compliance and should not create an expectation that historical allocations will continue without review. At the same time, stock-specific target and limit reference points, together with predetermined harvest-control rules, should connect changes in biological conditions to adjustments in the JTB and individual quotas.

The market-intensity dimension requires the regulation of effective control rather than merely formal transfers. Quota registers should record allocation recipients, transfers, use by other parties, affiliated relationships, beneficial owners, financing arrangements, and contracts governing landing, processing, or marketing. Concentration limits should encompass both direct and indirect ownership so that the fragmentation of corporate entities or the use of intermediaries cannot circumvent restrictions. The relevant authority should also be empowered to reject or invalidate transactions that create market dominance, excessive dependency, or non-transparent transfers of rents. Experience with ITQ regimes demonstrates that processing companies may control access through leasing, capital, and market information even where they are not recorded as the largest quota owners.

The distributive dimension requires affirmative access that small-scale fishers can exercise in practice. Such protection cannot be achieved solely through the category of local-fisher quotas because a geographical or administrative category does not necessarily identify fishers with the most limited economic capacity. Regulations should establish a protected share of access, transparent allocation criteria that do not rely exclusively on catch history, individual and collective allocation pathways, and support for reporting, financing, landing, storage, and marketing. Comparative evidence indicates that small-scale fisheries may remain viable under market-based management where special arrangements, concentration limits, and safeguards against the transfer of quotas out of the relevant segment are established. In the absence of such safeguards, market mechanisms may erode the social objectives that the regime was initially intended to preserve.

These distributive safeguards must be situated within the appropriate normative hierarchy. Inequality in allocation or declining income does not automatically establish a violation of UNCLOS, UNFSA, or the International Covenant on Economic, Social and Cultural Rights. Human rights obligations become relevant, however, where the design or implementation of quotas produces discriminatory exclusion, serious and foreseeable interference with livelihoods, or a failure by the State to take reasonable protective measures. The FAO Small-Scale Fisheries Guidelines and UNDRIP are not sources of conservation obligations equivalent to treaties, but provide normative standards concerning human rights-based approaches, participation, institutional recognition, and livelihood protection that may guide national law.

The corrective-capacity dimension further requires independent, multidisciplinary, and transparent review mechanisms. Such mechanisms may assess the relationship between scientific advice, the JTB, allocation, transfers, concentration of control, enforcement, and distributive effects, and subsequently publish recommendations and data open to public scrutiny. The establishment of such a panel constitutes an institutional choice under national law rather than a body expressly required by UNCLOS or UNFSA. For straddling or highly migratory stocks, the review process should also ensure data reconciliation, compliance with RFMO limits, and the compatibility of management measures. Domestic transactions do not require general RFMO approval, but they must not be used to circumvent regional conservation obligations.

Through this operationalisation, the contribution of the CCC lies in separating four questions that are frequently conflated: whether aggregate harvesting is consistent with conservation obligations; how national law constructs the strength of fishing rights; who controls access and rents through markets and contractual arrangements; and whether the State retains the capacity to undertake ecological and distributive correction. The framework does not categorically reject transferability, nor does it assume that every administrative quota is free from commodification. Instead, the CCC functions as an early-warning mechanism that identifies the point at which the security of rights, efficiency, or flexibility begins to diminish transparency, equitable access, and the State's adaptive capacity. For Indonesia, the regulatory objective is to preserve the Measured Fishing

Policy as an adaptive system of public allocation: sufficiently secure to be operational, yet conditional, reviewable, transparent, and responsive to stock conditions and the interests of small-scale fishers.

### **C. Conclusion**

This study concludes that quota-based conservation becomes commodified not because international fisheries law requires private ownership, but because domestic law progressively strengthens the security, duration, divisibility, transferability, leasing, and capitalisation of derivative harvesting entitlements. UNCLOS and, within its material scope, UNFSA retain the coastal State's sovereign rights and impose continuing duties of science-based conservation, precaution, cooperation, monitoring, and adjustment. Iceland and New Zealand create clearer formal pathways from scientific advice and harvest control rules to TAC decisions, while Indonesia's output-control model links JTB and catch quotas to resource potential and precaution but does not yet establish an equally general system of stock-specific reference points and pre-agreed adjustment triggers. The comparison therefore distinguishes formal design alignment from empirical compliance and confirms that public authority may remain legally intact even when asset values, lease dependence, or market concentration constrain its practical exercise.

The Conservation–Commodification Continuum contributes a legal-regulatory diagnostic framework that connects four dimensions: the strength of harvesting rights, market intensity, the distribution of access and rents, and the State's ecological and distributive corrective capacity. Its central conceptual implication is that commodification is cumulative, layered, and potentially reversible rather than a binary consequence of quota management. For Indonesia, the legal framework should expressly classify catch quotas as conditional, non-proprietary, non-perpetual, and non-collateralisable administrative entitlements; codify stock-specific target and limit reference points and harvest control rules; and create an independent, multidisciplinary review mechanism for scientific, precautionary, and UNFSA consistency where applicable. Domestic quota transfers need not receive generic RFMO approval, but reporting and data-reconciliation duties should ensure that transfers do not cause aggregate catches or vessel operations to exceed applicable regional allocations or conservation measures. Beneficial-control disclosure, concentration limits, dedicated small-scale access, participation, and review remedies are also necessary to address functional commodification and the human-rights implications of livelihood exclusion. The study is limited by its doctrinal-comparative design and documentary evidence, which cannot establish how consistently scientific advice is followed, how transfers operate contractually, or how fishers, enterprises, Indigenous communities, and implementing authorities experience the regimes. Future research should therefore test the CCC empirically across Indonesia's fisheries management areas by examining quota allocation, harvest-control decisions, lease or transfer arrangements, beneficial control, processor dependence, small-scale fisher access, and the distribution of rents. Longitudinal analysis should determine whether stronger entitlement security or emerging secondary transactions create rigidity and concentration or instead improve

compliance and stock responsiveness. Further comparative research should include community-based and Indigenous fisheries arrangements, examine dispute-settlement and RFMO compatibility issues for shared stocks, and develop measurable indicators of ecological responsiveness, control concentration, livelihood effects, and implementation of UNCLOS, UNFSA, ICESCR, UNDRIP, and SDG 14

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