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Posted Date: 23 September 2025

doi: 10.20944/preprints202508.1736.v2

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 doi:10.20944/preprints202508.1736.v2

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Adapting Science-Based Fisheries Improvement Mechanisms in Japan ~ Insights from MSC Certification Assessments ~

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Abstract

This research examines how Japan's declining coastal fisheries can be revitalized for sustainable development through globally- recognized certification systems with its mechanisms to promote improvements. Despite numerous Marine Stewardship Council (MSC) pre-assessments conducted so far, no coastal finfish fisheries in Japan currently possess the MSC certification in Japan. Mainly based on an analysis of MSC pre-assessment results, this study summarizes the identified management areas that must be strengthened for Japanese fisheries to meet international standards. The study further performs in-depth institutional analysis to identify the root causes of these management gaps, revealing structural weaknesses in Japan's co-management system. Analysis revealed four critical institutional issues as barriers to effective management implementation: the absence of precautionary, coordinated stock-based management objectives; non-inclusive decision-making; weak monitoring and evaluation mechanisms; and misaligned incentives to drive resource depletion. These findings underscore the need to update the co-management framework with extended technical and financial support to achieve science-based fisheries management in Japan. To advance reform and complement government efforts, locally adapted Fisheries Improvement Program (FIP) or pathway program, supported by multi-stakeholder collaboration may provide a stepwise, cost-effective mechanism to drive the necessary environmental recovery. Certification systems and FIPs can serve as an effective market-based incentive, but only if localized to embrace coastal and small-scale fisheries, which comprises 70% of Japanese fisheries. Localizing certification and improvement criteria without compromising scientific rigor can enhance feasibility and inclusiveness in the science-based fisheries management in Japan.

Keywords: co-management; fisheries management; sustainability standards; fishery improvement project; small-scale fisheries; sustainable seafood

1. Introduction

As the global population grows and demand for fishery resources increases, the importance of their sustainability is becoming ever more critical (FAO, 2024). The ongoing UN Decade of Ocean Science for Sustainable Development (2021–2030), emphasize the need for "transformative ocean science" which drives societal and institutional change through transdisciplinary collaboration, stakeholder co-design, inclusive and equitable practices, and the integration of local knowledge into action-oriented solutions(UNESCO-IOC, 2020) Market-driven approaches have been introduced to incentivize producers to voluntarily engage in practices that align with management objectives and support regulations (Melnychuk et al., 2025). The growing appeal of these schemes is largely attributed to the perception that some countries do not provide responsible fisheries management (Gutiérrez et al., 2012; Pérez-Ramírez et al., 2012) or do not accurately report on sustainability (UNEP, 2009;Washington & Ababouch, 2011;Bellchambers et al., 2016), and that additional tools would drive

 doi:10.20944/preprints202508.1736.v2

the change to make improvement to a global standard[1]. Although Japan is a developed country, about 70% of its fishers engage in coastal fisheries, most of which are small-scale and multi-species, managed primarily through traditionally established cooperative-based systems. Therefore, a localized approach is necessary if improvements toward global standards are to be pursued through market-based mechanisms.

Japan's fisheries production has been in a severe decline. Among stock-assessed species in Japan in 2019, only 24% of the species remain the stock at high level, while 32% and 44% of the assessed species' stock are at middle and low level (FRA, 2019). In coastal fisheries, the catch of non-TAC species accounts for approximately 60% of the volume and 80% of the production value. However, the production has been declining since 1980s from 2.27 million tons in 1985 to 0.89 million in 2017, being only 39% of its peak time (Fisheries Agency, 2021). Over the past 50 years, the number of fishers in Japan has declined to one-fifth of its previous level, with 40% of them now aged 65 or older. In the 2013 growth forecast for fisheries and aquaculture production released by the World Bank, significant growth is expected in India and other parts of Asia, while Japan is the only country predicted to experience negative growth of - 9% by 2030 (World Bank, 2013). When excluding aquaculture from this analysis, it becomes evident that the situation would be even worse for wild-capture fisheries alone with -15.6% growth projected between 2010 and 2030 (Figure 1).

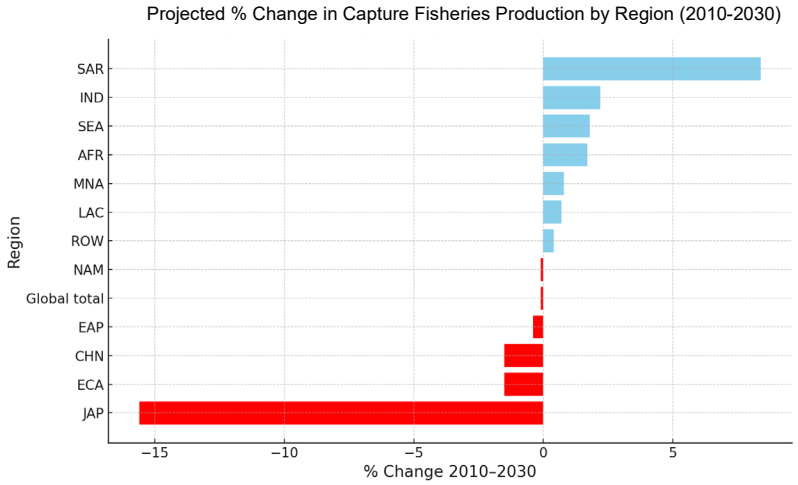

Figure 1. Projected growth change % in capture fisheries production by regions between 2010-2030. (Source: World Bank, 2016).

Nevertheless, the same World Bank report indicates that under a scenario where fisheries gradually improve their management, stock health and aquatic ecosystems by 2030, Japan would benefit the most globally with a 34% growth in catch compared to 2004 (Figure 2). This demonstrates the high potential around Japan archipelago, posing a challenge to our resource use. The study reports that if the government, fisheries resource managers, fishers, and local communities take the correct actions, it is possible to improve the productivity of stressed fisheries in many situations (World Bank, 2013). Therefore, it is crucial to understand what specific actions they should take in individual scenarios to restore marine ecosystems and resources in Japan.

[1]Global standards for sustainable fisheries refer to the FAO Code of Conduct for Responsible Fisheries (1995) and the FAO Guidelines for the Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries (2005, revised 2009).

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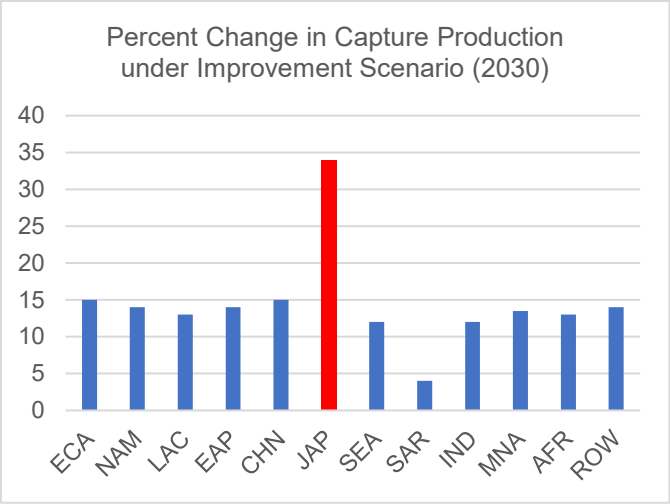

Figure 2. Projected Changes in Capture Fisheries Production in 2030 under Improvement Scenario (Adapted from Figure 4.7, World Bank, 2016). Note: ECA = Europe and Central Asia; NAM = North America; LAC = Latin America and Caribbean; CHN = China; JAP = Japan; EAP = other East Asia and the Pacific; SEA = Southeast Asia; IND = India; SAR = other South Asia; MNA = Middle East and North Africa; AFR = Sub-Saharan Africa; ROW = rest of the world.

This paper examines the potential for improving Japanese coastal fisheries through fisheries sustainability certification and Fisheries Improvement Projects (FIP)[2] (MSC, n.d.; SFP, n.d.; WWF, n.d.), based on an analysis of Marine Stewardship Council (MSC) pre-assessment and full assessment results. The study employs the MSC Fisheries Standard as the benchmark for evaluation, as it is widely seen as the most rigorous and credible certification scheme available, closely aligned with the FAO Code of Conduct for Responsible Fisheries (FAO, 2009; Gulbrandsen, 2009).

MSC pre-assessments are known to provide valuable insights into areas that require improvement (Rasal et al., 2024). In 2021, Wakamatsu and Sakai have analyzed Japanese MSC pre-assessments conducted in the past decade by third-party experts, covering various types of coastal fisheries, representing the first collective, evidence-based analysis of Japan's coastal fisheries against international standards (Wakamatsu and Sakai, 2021). However, this research has not explored the root cause behind why Japan's historically well-regarded co-management system, has led to the overall failure to meet the MSC's sustainable fisheries standard.

Using an empirical approach, this study draws from the author's decade of engagement as an MSC auditor to externally conduct MSC pre-assessments and full assessments (totaling 52 reports) as a member of various MSC assessment teams, as well as some fisheries improvement consulting in Japan. This research examines why Japanese coastal fisheries fail to pass, by identifying commonly observed management practices that contribute to weak Performance Indicators (PIs), based on author's field observations and stakeholder interviews conducted during assessment processes. Finally, it proposes what and how improvements are needed to achieve sustainable fisheries in Japan.

In section 1 this paper first consolidates the key bottlenecks identified in past MSC pre-assessment and full assessment audits as a gap analysis in terms of current management measures implemented in Japan. Since Wakamatsu et al.(2021) had already summarized the common weak PIs to see if Japanese fisheries qualify MSC certification, translating the identified weak PIs to management performances observed will be useful to understand the needs for future improvements (section 2). Section 3 analyzes the root causes on why these gaps emerge by looking into institutional factors that constitute Japanese co-management system. Key shortcomings observed in the co-management system and limitations of domestic certification system are discussed. In section 4,

[2] A Fishery Improvement Project (FIP) is a step-wise, multi-stakeholder initiative aimed at improving fishing practices and governance to enable ecological and social sustainability。

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Lessons from global practices on how these gaps can be filled are introduced to propose effective solutions, including use of certifications and Fishery Improvement Projects (FIPs).

2. Methodology - Gap Analysis of Japanese Coastal Fisheries with MSC Standards from Past assessments

2.1. MSC Certification Assessment in Japan

The MSC Fisheries Standard v2.0 (MSC, 2014) evaluates fisheries across 28 criteria grouped under three principles: Principle 1 (Stock Status), Principle 2 (Environmental Impact), and Principle 3 (Management System). These principles are intricately interrelated to function in a complementary manner. Notably, Principle 3 is evaluated based on its capacity to support the fulfillment of Principles 1 and 2. The standard requires not only alignment with international agreements like UNCLOS (1982) and the FAO Code of Conduct (1995), but also demonstration that the actual situation in a fishery meets the outcome implied by this intent (Agnew et al., 2014).

As of now, 12 Japanese fisheries are MSC-certified—10 are tuna/skipjack fisheries managed under both RFMOs and Japanese authorities, while only 2 are coastal fisheries, which are both sedentary shellfish fisheries (oyster and scallop) and certified under MSC's specific "catch-and-grow" standard[3]. One coastal fishery under domestic management was once certified but subsequently withdrew from the program (explained later). As a result, no coastal finfish fishery in Japan is currently certified, although many have undergone preliminary assessments since 2013.

Table 1. List of MSC-certified fisheries in Japan as of July 2025.

No.	Company or Organization Name	Main Target Species	Fishing Method / Type	Notes
1	Meihou Fishery Co., Ltd.	Skipjack & Albacore Tuna	Pole-and-line	RFMO managed International stock, Tuna and skipjack fishery
2	Usufuku Honten Co., Ltd.	Atlantic Bluefin Tuna	Longline	
3	Owase Bussan Co., Ltd.	Albacore, Yellowfin, Bigeye Tuna	Longline	
4	Fukuichi Gyogyo Co., Ltd.	Bigeye, Yellowfin, Albacore Tuna	Longline	
5	Coastal Pole-and-line Tuna Fisheries MSC Certification Preparation Council	Skipjack & Albacore Tuna	Pole-and-line	
6	ITOCHU Corporation (1st fishery)	Skipjack & Yellowfin Tuna	Purse Seine	
7	Katsuo Ipponzuri Fishery Co., Ltd.	Skipjack & Albacore Tuna	Pole-and-line	
8	ITOCHU Corporation (2nd fishery)	Skipjack & Yellowfin Tuna	Purse Seine	
9	Kyowa Suisan Co., Ltd. & Meihou Fishery Co., Ltd.	Skipjack & Yellowfin Tuna	Purse Seine	
10	Taiyo A&F Co., Ltd.	Skipjack & Yellowfin Tuna	Purse Seine	
11	Hokkaido Federation of Fisheries Cooperative Associations	Japanese Scallop	Culture (basket/rack)	Japanese Coastal Fishery
12	Maruto Suisan Co., Ltd.	Pacific Oyster	Rope-hanging Culture	

Wakamatsu et al. (2021) analysed 53 pre-assessed fisheries from 2015–2018. They found that 40% did not meet MSC's stock status requirements (Principle 1), though improvements could be realized through adopting more conservative harvest strategies. In Principle 2, many lacked sufficient data on environmental impacts, including bycatch and habitat effects.

In Wakamatsu (2021), Principle 3 (management system) was concluded as a strength in fisheries in Japan, with only one fishery directly failed in this principle. Nevertheless, the research further asserts that even in P3, the Japanese pre-assessed fisheries have much room for improvement since

[3] The MSC "catch-and-grow" standard applies to fisheries where juveniles or spat are collected from the wild and then grown to market size in controlled conditions, such as sea ranching or community-based coastal grow-out. Although considered aquaculture-like, these operations are assessed under MSC as wild capture fisheries, because the initial stock is taken directly from natural populations.

 doi:10.20944/preprints202508.1736.v2

the globally MSC-certified fisheries achieved significantly higher scores, particularly in consultation, decision-making, and performance evaluation (PI 3.1.2, 3.2.2, 3.2.4). A detailed examination of how these weaknesses contribute to failures in other principles contributes to future improvement.

2.2. Certification and Improvements Barriers

Between 2013 and 2023, the author participated in 17 MSC fishery pre-assessments covering 66 species across Japan. Most were small-scale, multi-species, multi-gear coastal fisheries under governor-issued permits or common fishery rights. While pre-assessments provided valuable insights, only two fisheries advanced to full assessment, and only one (an oyster fishery) was eventually certified.

Despite past MSC pre-assessments revealing clear opportunities for improvement—particularly for coastal fisheries—progress often stalled due to difficulties in interpreting technical results in English reports for Japanese clients and the absence of a support system for implementing required improvements. While conditions requiring improvement are common globally and intended to foster progress (Hønneland, 2020), in Japanese coastal fisheries, such findings often led to discontinuation of the certification process, with little follow-up on conditions. This is due to an absence of a realistic, localized system that drives fisheries improvements including technical and funding support, supported by government and market cooperation for coastal fisheries. Without an effort to create such a system, even if consumer awareness on MSC increases, it would primarily benefit certified imported or internationally managed fisheries, while Japan's own fisheries risk being left behind as the world moves towards more sustainable practices.

Internationally, FIPs are expanding, with 341 FIPs operating in 2024, 43% covering the artisanal sector, and small-scale, multi-species fisheries (Levine et al., 2020). FIPs come with a structured and supportive process where fisheries develop a Fisheries Improvement Action Plan to address specific weaknesses identified from assessments. The required improvements, implemented to meet established pre-determined milestones often with FIP implementers assistance, are verified through annual surveillances in the MSC certification scheme, conducted by the independent Conformity Assessment Bodies (CABs). Given structured support, Japan's pre-assessed fisheries could be promising FIP candidates. The motivations behind fisheries in Japan applying for pre-assessment varied, but most were driven by the strong will or leadership of individuals in fishery or seafood companies, based on a combination of perceived benefits, such as business opportunities, increased market visibility, ecosystem and long-term sustainability of fisheries and businesses. However, even to begin the preassessments, lack of funding and stakeholder consensus frequently blocked progress. With a stronger support structure for improvement, more fisheries could have pursued certification and improvements.

2.3. Domestic Perceptions and Certification

Within Japan, some argue that MSC standards are poorly suited to the nation's complex, multi-species fisheries and that the top-down model assumed by MSC doesn't align with Japan's co-management system (JFA, 2018). Although this view was denied as there are also small-scale, multi-species MSC certified fisheries globally, high cost of assessments was considered prohibitive to small-scale fisheries (JFA, 2018, Orita, 2019). Other reasons included limited price premiums due to complex domestic distribution, low consumer demand and difficulties assessing multi-layered Japanese fisheries co-management system (Swartz, 2017), (Blandon and Ishihara, 2021).

As an alternative, the Japan Fisheries Association developed the Marine Eco-Label (MEL) Japan, which offers more flexible and less rigorous assessments. Although MEL is GSSI-certified under its revised standard version 2.2, the absence of a robust review process allows broader discretion for auditors, which in turn may result in arbitrary evaluations during certification (MEL, 2022). As a result, some fisheries that did not meet MSC standards were certified under MEL without making substantive improvements (Unknown, 2024, 2022). The concept of MEL is to support Japanese coastal fishers so that they are not disadvantaged by foreign certification schemes in markets; thus, the

 doi:10.20944/preprints202508.1736.v2

scheme has insufficient mechanism to promote improvements toward sustainable fisheries, such as the need for fishery to create and implement the Improvement Action Plan, compared with MSC. Given the prevailing view taken highly by some Japanese academics and industries that Japan's fisheries co-management is well regarded internationally (Makino & Matsuda, 2005; Gutiérrez et al., 2011), limited attention has been paid to assessing its weaknesses so far. As a result, domestically, MEL and MSC certification's differences are generally perceived in terms of cost and applicability, while recognition that certification as a tool for promoting exports or seafood consumption is dominant (Orita, 2019), rather than a mechanism to improve fisheries sustainability.

2.4. GAP Analysis Results

Audits on Japanese coastal fisheries highlighted shortages in evidence, causing the fisheries to fail against the MSC standard. The results for the Japanese fisheries are summarized below.

Principle 1 - Stock Status.

- Disparity between the provided scientific recommendation for sustainable management (stock assessment and suggested harvest strategies) and the fishery-specific management plan (Resource Management Plan).
- Lack or shortage of precautionary approach to management objective setting and its decision making.
- Lack of harvest strategies and rules coordination by stocks among different fishery units for widely distributed (transboundary) fishery resources.
- Internationally shared stock without management coordination (mostly with Korea and China).
- Lack of catch data reporting through logbook, which provides necessary information for stock assessment, such as species and catch size.

Principle 2 - Ecosystem Impacts.

Japan's fisheries management lacks an ecosystem-based approach, which is essential for ensuring fisheries long-term sustainability. Key gaps include:

- Insufficient reporting and data collection on bycatch and endangered species.
- Limited consideration of ecosystem impacts from bycatch and endangered, threatened, and protected (ETP) species.
- Neglect of the carrying capacity of fishing grounds or habitats, especially in coastal aquaculture and sedentary species fisheries.
- Habitat modifications (e.g., seabed plowing, large artificial reef installations) conducted without adequate ecosystem considerations.
- Over-reliance on stock enhancement without robust scientific backing, potentially falling outside MSC scope.
- Insufficient attention to genetic effects on natural populations.
- Lack of measures for proper gear disposal and reduction of plastic waste.
- Limited attention to the sustainability of bait fisheries.

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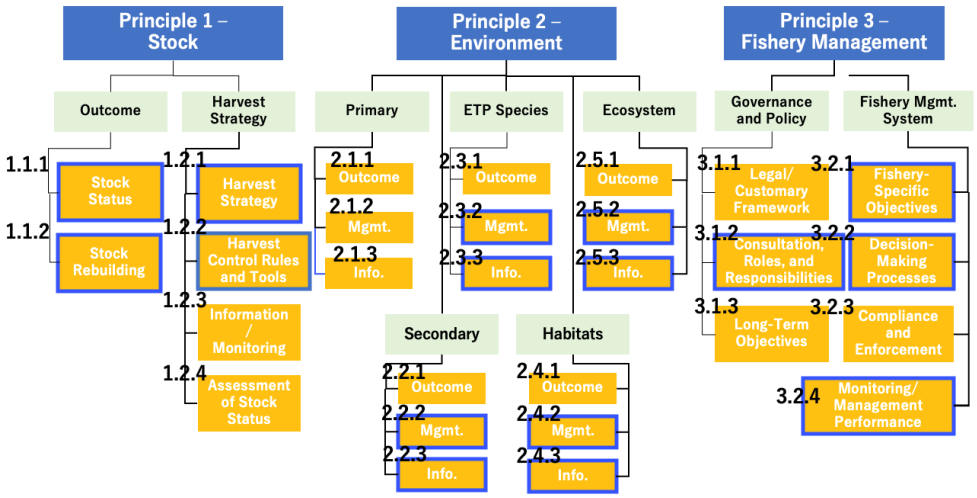

Figure 3. The 28 Performance indicators from 1.1.1 to 3.2.4 in the MSC Standard in a default tree. Performance Indicators (PIs) that are particularly weak in Japanese coastal fisheries are highlighted in blue frames.

Principle 3 - Management Systems.

Japanese fisheries have historically passed 3.1.1（legal/customary framework） and 3.1.2 (decision-making processes). While PI 3.1.3 (long-term objectives) has been a weak area, the revised Fisheries Act now aligns Japan's management with MSC's standard, if implementation goes successful.

- Lack of clear, stakeholder participation mechanism which provides consultation opportunity for all interested and affected parties to be involved.
- Lack of fishery-specific long-term goal that achieves Principle 1 and 2 objectives explicit within the fishery-specific management system.
- Lack of decision-making processes:
    1. that result in measures and strategies to achieve the fishery-specific objectives.
    2. that respond to serious and important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
    3. with precautionary approach and the use of best available information.
- Lack of accountability and transparency (data and meeting records sharing upon requests)
- Lack of unclear evidence provision on Monitoring, Control and Surveillance system implementation and its enforceability with penalties or right incentives
- Lack of management effectiveness evaluation (Fishery Management Plans, management measures and subsidies, etc.).

The MSC standards are further analyzed through the lens of key components required in fisheries management plans to ensure effective governance. From the aspect of Fishery Management Plan, the 28 PIs can be organized as shown in Figure 4. Principles 3.1.1 to 3.1.3 falls onto overarching management framework which is set by central government as a legal and policy framework. Then 3.2.1 – 3.2.4 are fishery-specific management measures, which includes specific management measures assessed in Principle 1 and 2. It is evident that 3.1.1. and 3.1.2, that Japanese fisheries do better than other global fisheries, are all categorized in overarching governance. The fishery-specific management indicators are the weakness of Japanese fisheries, here they underperform compared to global fisheries. Japan has an excellent governance but has insufficient implementation of the policy.

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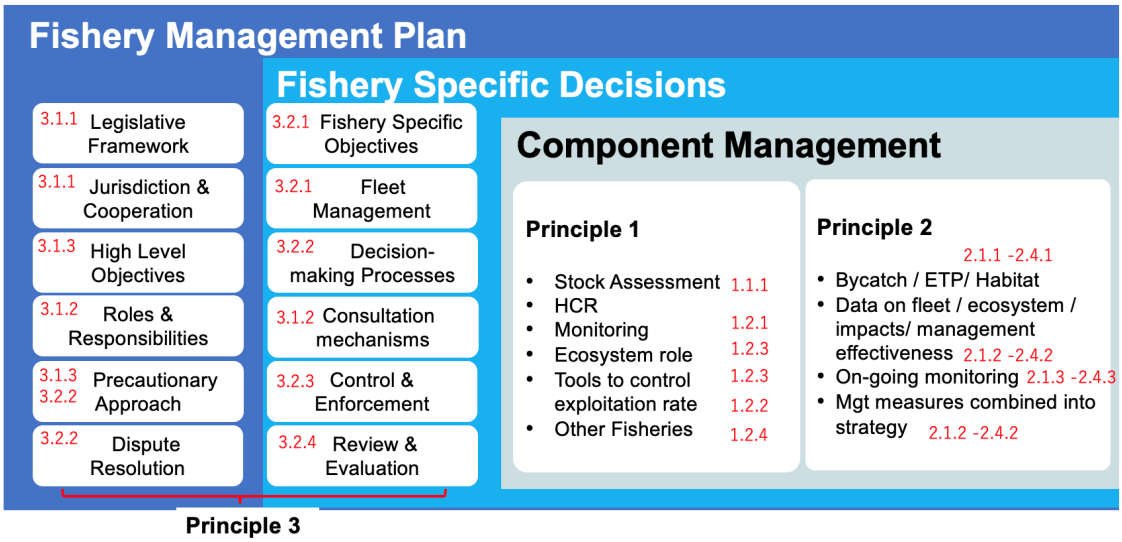

Figure 4. A reconstructed diagram of MSC assessment indicators, organized as general elements consisting of a fisheries management plan. This figure does not represent the official view of MSC but was used by a trainer during a MSC's FIP training session to support participants' understanding (Southall, 2018)). The PI number was added in parenthesis by author to show matching PIs to each element.

In principle 1, while bottlenecks were found in stock status (PI 1.1.1), stock rebuilding (PI 1.1.2), and harvest control rules (1.2.2) , it was information and monitoring (PI1.2.3) that had the least number of fails, meaning that although information does exist, the decision-making system (PI 3.2.2) does not allow it to reach the expected management strategy and outcome of stock to the level. This eventually affects the fishery-specific management resulting in improvements needed in long-term objectives (3.1.3), consultation (PI 3.1.2b), fishery specific objective (PI 3.2.1), and management performance and evaluation (PI 3.2.4).

In Principle 2, bycatch species including ETP species, were both weak in terms of information and management, and sometimes performed well for target species but do not sufficiently consider related species and habitats, - this is because of governments' siloed system. This can be reflected to the insufficient fishery specific management (agreement) reflected in 3.2.1.

In Principle 3, the existence of documented policies and decision-making frameworks provides the appearance that co-management is functioning effectively. This surface-level structure in overarching governance often compensates for overall low scores in Fishery-Specific Management, allowing the principle to barely pass in assessments. However, in-depth pre-assessments reveal that critical implementation gaps lie within the Fishery-Specific Management component. These weaknesses are directly linked to the failures observed in Principles 1 and 2.

3. Analysis - Why These Gaps Emerge: Institutional Factors (1.1.1, 1.1.2, 1.2.1, 3.1.3, 3.2.1)

3.1. Japanese Co-Management and Resource Management Agreement (RMA)

The analysis highlighted a lack of coherence between resource management objectives and policies established by national and prefectural-level governments and fishery-level resource management plans (agreements) formulated by fishermen. This misalignment stems from the absence of a responsible coordinating authority that ensure a science-based decision-making processes.

Co-management involves shared fisheries governance between the government and fishers, but its actual forms vary widely, ranging from government-led to fisher-dominated systems, with differing roles and degrees of responsibility (Pomeroy & Berkes, 1997). A key element of Japan's

 doi:10.20944/preprints202508.1736.v2

coastal management system lied in its principle "resource management by resources users" (Makino, 2011), Fishery Act, 1949 amended in 2018) in which fishermen play the central role in decision-making. Although support from the government and research institutions is available upon fishers' agreement, the management decision, including the development of measures, are largely left to fishing communities. The limited governmental responsibility for science-based management appears to be partly attributable to Japan's outdated legal framework, originating in the early 6th century, which defined living marine resources are regarded as res nullius (ownerless property) until captured (Arizono, 2018)." This interpretation is based on Article 239 of the Civil Code, which stipulates that ownership is acquired by occupying an ownerless movable with intent to own. The Fisheries Act regulates the right to harvest rather than ownership of the resources themselves, and thus fishers obtain ownership only upon capture, within the limits set by licenses and fishing rights. (Hakala et al., 2023) pointed that Japan's fishery management objective historically lied in the social definition of success, such as supporting fishing communities rather than biological definition of success, such as resources management and sustainability of stocks. Compared to many developed countries, where fishery resources are regarded as national common property and managed for their sustainable use, decision-making in Japanese fisheries gives limited weight to science and lacks clear criteria to ensure long-term resource sustainability. Instead, management decisions are often based on the immediate preferences of fishers or social considerations, based on consensus. This situation appears to stem from the absence of clear governmental accountability for resource stewardship, with the assumption that such responsibility lies with fishers themselves. In Japanese fisheries, key decision-making bodies include fishery cooperatives, wide-area fishery coordination committees at the prefectural and regional level, and national policy councils and locally established voluntary Fisheries Management Organizations (FMOs) typically organized around specific gear types or target species. However, outcomes to date indicate that fishers alone have been unable to ensure effective and sustainable management.

Since 2011, fisheries have been recommended to formulate their own Resource Management Plans (RMP) under the Resource Management and Fisheries Operation Stability Program. With the enactment of the Revised Fisheries Act in 2018 these are updated as "Resource Management Agreements (RMA)". These agreements must be prepared by fishery license-holders in accordance with national or prefectural policy guidance and are submitted to the respective government bodies for approval. Such approval is a prerequisite for enrolment in the fishermen's mutual aid compensation scheme, which provides financial support for income reductions, covering up to 90% of previous earnings. This scheme is intended to incentivize restrictive management practices while preserving community livelihoods, under the assumption that such plans are well-integrated, science-based, and tailored to local ecological and social contexts. However, in practice, these plans often fall short of these goals, as explained below.

3.2. Key Issues in Co-Management

Issue 1. Lack of Science-based Objectives, with Management Measures Coordinated by Stock (PI 3.1.3, 3.2.1)

Analysis of fisheries that underwent MSC assessments revealed four critical issues with Japan's current co-management system. The first issue is the lack of well-defined, science-based objectives and measures within management plans. Many plans fail to include explicit numerical targets aligned with sustainable management benchmarks, such as Maximum Sustainable Yield (MSY), integrating science-based sustainable management objective (3.2.1) with measures encompassing official measures (such as TAC, Resources recovery plan) and voluntary measures in place.

Many of the RMAs are not aligned with national or prefectural guidelines provided officially. Even when stock assessments are available from the Japan Fisheries Research and Education Agency (FRA) for widely distributed stocks, these are not reflected for stock-unit management (Figure 5). This deficiency in official management objective setting is partly due to the flexibility embedded in Japan's TAC and Total Allowable Effort (TAE) system as well, which historically allowed for the

 doi:10.20944/preprints202508.1736.v2

inclusion of socioeconomic considerations to lower objectives, rather than localizing approaches for implementation. Although the amended Fisheries Act now require fisheries scientific objectives such as MSY-based targets, establishment of scientific reference points, and IQ, aligning with the policies of FAO sustainable fisheries and MSC, the historical absence of the responsible management system to conduct stock-based management fail to align all fisheries targeting the same stock. To cope with the stagnated implementation of the Act, the Japan Fisheries Agency (JFA) introduced a stepwise approach to gradually implement the MSY target for newly designated TAC species. However, due to strong opposition from fishers, there is still no clear or foreseen timeline for progressing from the current Step 1 (data collection only) to Step 2 (TAC allocation) and to Step 3 (enforcement with sanctions) (personal communication with JFA, 2025). For non-TAC species, the revised Fisheries Act updated the RMPs to RMAs, and clearly set its requirement to be approved by government under the revised Fishery Act Article 125. The number of species subject to official stock assessments are also increased to 200. However, the content of the RMA remains flexible, with approval criteria that are vague and left to be determined by each fishery.

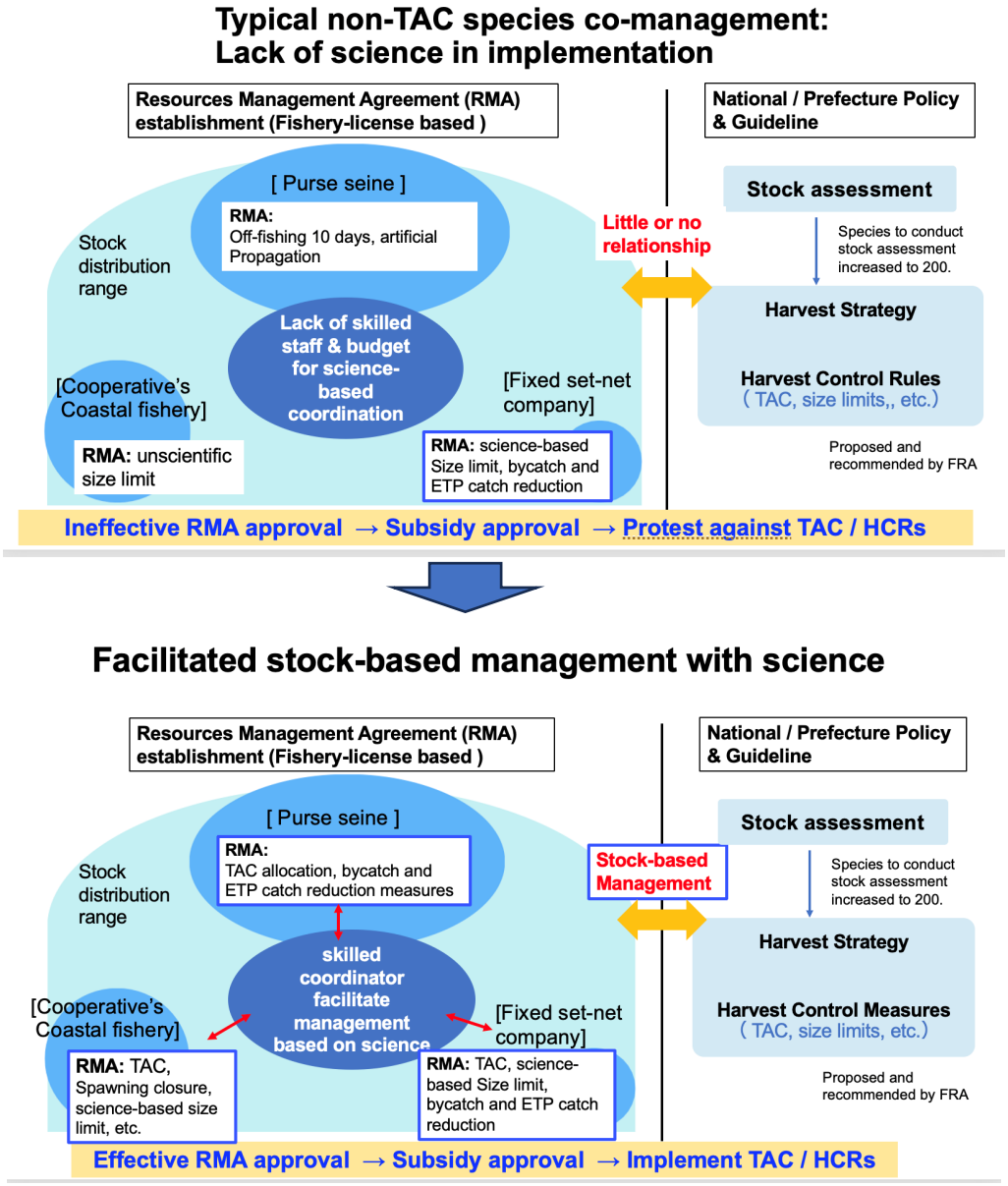

Figure 5. Schematic diagrams showing a typical non-TAC species' co-management lacking science and an ideally facilitated stock and science-based co-management.

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Most frequently observed resource management measures reflected in the past RMPs and current RMAs tends to follow the model templates of the plan format provided by the Fishery Agency to help fulfill requirement to make the plan, such as "10- days off-fishing dates" and "artificial propagation", or artificial habitat modification such as establishment of fish aggregating concrete blocks for effective fishing, which may seem that the measures are in place, but lacks evidence in long-term resources sustainability (Miyazaki Prefecture, 2024; Nagasaki Prefecture, 2022). As a result, in the past pre-assessments, harvest strategies and other management measures are not effectively structured to control catches in a way that conserves parental fish populations or help ecosystem sustainability. In some cases, conflicting conservation and development measures are implemented by different fisheries sharing the same stock, making it difficult to achieve effective outcomes. Also, ecosystem-based management is rarely incorporated, due to the siloed administrative structure that separates fishery and habitat from ecosystem policy domains. As the plans can be prepared by any license units, such as individual fishing company or cooperatives irrespective of the stock distribution range, without responsible coordinators' presence it is hard to make the effective plan /agreement by fisheries alone.

Issue 2. Decision Making and Stakeholder Participation (mainly PI3.1.2, 3.2.2 and all other related PIs)

The second issue concerns decision-making and stakeholder involvement. While co-management implies a shared responsibility between government and fishers, in practice, decision-making is centrally delegated to fishing communities (Makino, 2013), without clear guidance on objectives and measures as seen in Issue 1. When government establishes a fisheries management policy or measures, such as TAC, Total TAE in Resources Recovery Plan, fishermen are consulted in advance, and in every objective setting of the measures and even the confirmation of compliance with measures in the RMA, fisheries remain at the center of decision-making. Expert advisors invited to the fisheries policy councils are composed primarily of academics or experts who are acceptable to the fishing industry. This composition raises concerns that it may limit the inclusion of independent or critical perspectives, thereby hindering the introduction of new knowledge and innovation into the policy process. This dynamic where only limited government-fishermen discussion determines its policy, management measures, and evaluation in closed settings, short-term management objectives that do not cause hardships for fishers are likely accepted to continuously decrease target objectives by selecting the most conservative choices that prioritize short-term socioeconomic stability. The consensus-driven structure of decision-making in fishery cooperatives, where internal decisions are seldom challenged, further reinforces this tendency and makes it difficult for the voices of small-scale and coastal fishers to be heard.

Scientific institutions, such as FRA, have limited independence and restricted capacity to initiate or fund necessary research. Their role appears to remain supportive rather than directive. The result is a lack of robust data collection and scientific input in management plans, failing to convince precautionary approach incorporated in the decision-making. The distortion in the decision-making mechanism appears to have also arisen from the lack of science-based explanations provided by the government and scientists, which has resulted in fishers being compelled to make decisions based on insufficient scientific information. Until the 2018 law revision, consultation processes have limited inclusion of citizen groups, NGOs, and external experts. While it was possible for them to attend as observers, observers were not granted the opportunity to provide comments or participate in the discussion. This contrasts with internal meetings and coordination among the selected official members, which are frequently held, with opinions coordinated in-house. The record first showed signs of increased transparency in 2017, when WWF-Japan was invited to participate in Fishery Policy Council discussions prior to an International Scientific Committee (ISC) meeting for the first time, and public comments were invited through an online platform (Gascoigne et al., 2023).

The approval process of RMPs took place in committees composed of government officials, fisheries cooperative representatives, and affiliated mutual aid insurance entities, without broader stakeholder involvement. As such, the needs of future generations of fishermen, the general public,

 doi:10.20944/preprints202508.1736.v2

and marginalized small-scale fishers who support long-term resources sustainability are often unrepresented. This deficiency has been reflected in the history of Japanese fisheries long-term goal settings, where objectives had been set at Blimit in Japanese TAC system, instead of Btarget to achieve MSY as a long-term objective (FRA, 2018). While the revised Fisheries Act has introduced requirements for disclosure of all fisheries RMAs, chances for external stakeholders and academic research have opened. However, after historical exclusion, number of citizen groups are scarce in Japan.

Effective implementation requires facilitation with an effective guideline to involve necessary stakeholders for science-based, stock-range management integration. However, Hakala et al. (2023) pointed out that Japan's Fisheries Act and regulations lack specificity and rely heavily on individual government managers to balance biological sustainability with the economic well-being of fishing communities. Moreover, in most regions—except for areas like Hokkaido—government personnel, including staff from prefectural fisheries departments, research institutes, and extension officers who work directly with coastal fishers, are rotated every 2–3 years. This generalist-oriented staffing system, which deters to accumulate long-term specialization at local sites, undermines trust-building with fishers, reduces the quality of technical support, and hampers the consistent implementation of long-term management goals. Unless more opportunities for involving external experts with long-term, specialized capacity in science-based resource management become available, maintaining and updating effective management plans appears difficult.

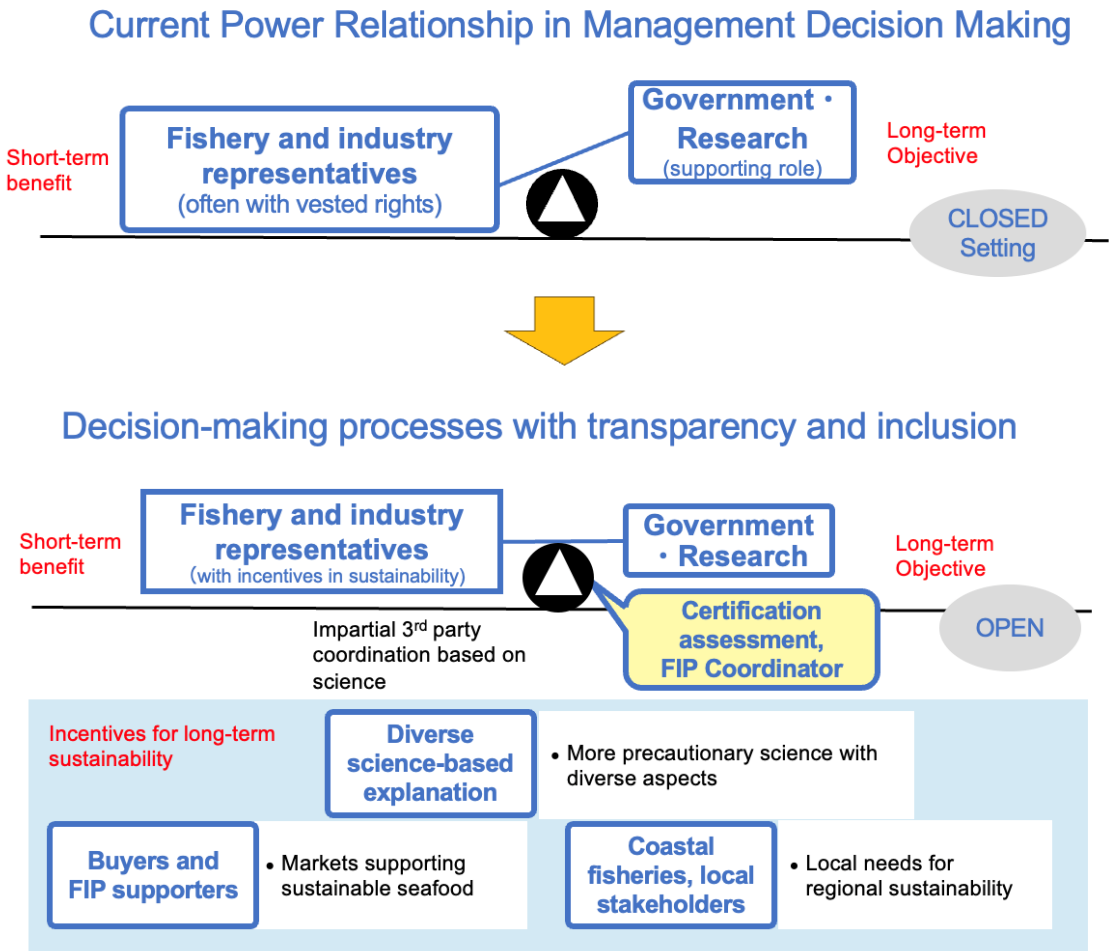

Figure 6. Schematics of the closed, fishers-centered decision making to equitable, sustainability-oriented decision-making process.

Issue 3: Weak Monitoring and Evaluation Mechanisms (PI 3.2.3, 3.2.4)

 doi:10.20944/preprints202508.1736.v2

A third systemic issue is the absence of rigorous monitoring and evaluation mechanisms. Implementation of the RMP/RMA is confirmed at compliance councils convened by national or prefectural governments; however, the process lacks clear approval criteria and often serves as a procedural formality. The council members consist of representatives from fisheries cooperative, fisheries cooperative's mutual aid company, prefectural fisheries department, prefectural fisheries research institute. Determinations are based on the consensus, and the council discussion range is limited to minimal legal compliance check, without clear criteria to verify whether measures are scientifically sound or effectively enforced. Locally implemented gear- or species-specific measures developed by FMOs are often not reflected in official plans, because only verifiable measures are listed in the RMA for their evaluation purposes, while voluntary measures can be included in an appendix document.

Issue 4: Misaligned Incentives and Budget Allocation (3.1.3, 3.1.2, 3.2.2 and all other related PIs)

The final issue relates to misaligned incentives and skewed budget priorities. Income compensation is often provided regardless of whether a fishery demonstrates effective resource management, weakening the incentive to adopt or enforce sustainable practices. This enabled the continuation of fishing operations without practicing genuine management efforts. This institutional arrangement has contributed to resistance against stronger regulatory measures such as Total Allowable Catch (TAC). Meanwhile, Japan's fisheries budget continues to prioritize infrastructure and operational subsidies over science, training, and coordination. In 2023, only 8% of the budget was allocated to resource assessment and management, compared to 29% allocated to fisheries subsidies for operational stability, 35% for infrastructure and public building / ports construction projects, 11% for strengthening competitiveness through high-tech, high-performance fishing infrastructure investment, with reminder for foreign fishing activities, aquaculture and whaling, capacity building, coastal fishing community revitalization. The lack of investment in fishery-specific advisory services, research, and capacity-building undermines efforts to improve fisheries management.

Although the official management is admitted as the most effective measures to reduce fishing pressure from number of sources (Melnychuk et al., 2025; Wakamatsu and Sakai, 2021), the weakness in decision making process (PI 3.2.2) prone to the Japanese "co-management", which is essentially left to fishers themselves without an appropriate incentive mechanism for long-term sustainability hinders the alignment with long-term objective (PI 3.1.3), eventually to affect insufficient harvest strategy as in PI 1.2.1.

3.3. RMA – Key Needs for Improvement

Japanese fisheries with sedentary species, such as scallop and oyster with strong local leadership and scientific support have achieved success in MSC certification through their community-based management. However, those targeting widely distributed stocks struggle with coordination and science-based management. The Kyoto Danish Seine fishery, Japan's first MSC-certified fishery, withdrew from certification due to lack of support for stock-based management, under the pre-reform Fisheries Act.

Ostrom's foundational work on collective resource governance identifies essential conditions for effective co-management including clearly defined boundaries, participatory decision-making, and robust monitoring (Ostrom, 1990). In many Japanese coastal fisheries' co-management, these conditions are unmet, particularly for widely distributed species. The result is a system vulnerable to the tragedy of the commons, where lack of coordinated oversight leads to unsustainable exploitation.

The RMPs had not been disclosed until the revision of the Fisheries Act mandated the publication of RMAs in 2020, since they were confidential and kept internally within fishery organizations. The external reviews in the MSC pre-assessment process revealed that in many cases, fisheries had been preparing these not just as a mere formality, but as a procedural requirement to renew licenses / continue the income insurance membership. In some cases, fisheries have well-

 doi:10.20944/preprints202508.1736.v2

designed and detailed RMPs, often developed in response to stock collapses or crises following natural disasters.

While co-management has been effective in maintaining order and reducing administrative costs under conditions of resource abundance—and has functioned relatively well with lowered management objectives and the goodwill of fishers—it is insufficient to ensure long-term sustainability. In some cases, it imposes a disproportionate burden on specific groups of fishers to conserve resources.

In sum, Japan's co-management need to be strengthened with essential elements for effective resource management, such as resource-unit–based management with clear science-based objectives, inclusive decision-making with transparency, technical guidance for improvement, that are supported by adequate budget and technical staff. Co-management remains an essential framework for covering the diversity of fisheries in Japan. However, it must clearly define key management roles for implementing science-based, ecosystem-oriented management and provide technical support to ensure the long-term viability of fisheries. MSC assessments have highlighted critical gaps in these areas. Beyond delegating responsibility to fishers, it is essential to equip them with the training, expertise, and access to specialists needed to address today's complex challenges. Given the increasing vulnerability of coastal ecosystems to climate change, updating co-management is vital to safeguarding regional fisheries. External evaluations and support from non-governmental sectors, ensuring adequate scientific input and expert coordination will also strongly support the implementation. As the World Bank report (2013) showed, addressing these institutional weaknesses is essential to reverse the trend of declining resources.

4. Discussion - How the Gaps Can Be Filled

4.1. Global Practices on Small-Scale, Multi-Species Fisheries

In the state of Western Australia in Australia, for example, findings from MSC pre-assessment gap analyses prompted a shift away from purely top-down decision-making to government-facilitated stakeholder engagement, especially incorporating fishermen's voice. Diverse knowledge and perspectives were integrated into a transparent decision-making process, leading to the development of stakeholder engagement guidelines (Government of Western Australia, 2016). To cope with their fisheries being data-limited and multi-species, they introduced regional ecosystem monitoring and centralized data-sharing systems to support all kinds of fisheries to help them obtain MSC certification, reducing the burden on individual fisheries (Bellchambers et al., 2016). Globally, various methods for managing and improving small-scale and multi-species fisheries are being developed and studied, each tailored to specific local contexts (Karr et al., 2017), (Kleisner et al., 2022).

In Japan, where 70% of fishermen engage in small-scale, coastal, and multi-species, localized and stepwise adoption of global best practices could accelerate sustainability. Strong community organizations already exist and, if guided appropriately, can support data collection and implementation. Existing stepwise approach to TAC can be combined with effective small-scale fisheries voluntary regulations, so that fisheries making proactive efforts are supported through FIPs. Collaboration among fisheries sharing the same stock can foster self-driven improvements and enhance management effectiveness. Integrating all measures, including spawning site protection and seabed restorations, for example, into a unified framework can accelerate stock recovery. As Melnychuk et al. (2021) noted, broader management measures, especially those with strong mandates, lead to improved stock conditions and long-term yields.

As the coastal ecosystem management is fragmented in Japan, and remains a central barrier to international certification, integrating local ecological knowledge with scientific evidence obtained from 3rd party assessments can improve community-led efforts, incorporating Ecosystem-Based Fisheries Management (EBFM). A shift is needed from artificial interventions—such as aquaculture and hatchery-based approaches prioritizing industry's short-term gains—toward nature-based solutions that are long-term and aligned with ecosystem functions.

 doi:10.20944/preprints202508.1736.v2

In the U.S.—a frequent legal model for Japan—has institutionalized ecosystem-based fisheries management through the Magnuson-Stevens Act. Japan still lacks a robust legal foundation to integrate ecological considerations into fisheries policy. The foundational principles of fisheries economics suggest that sustainable resource use maximizes long-term economic returns (Clark, 1973;Grafton et al., 2007), and that in the absence of effective regulation, fisher behaviour tends to converge toward an overfishing equilibrium—a classic example of the tragedy of the commons (Gordon, 1954; Hardin, 1968). Despite these well-established theoretical insights, Japan's fisheries governance remains constrained by old institutional and legal designs. Without embedding ecosystem sustainability as a core principle and restructuring fragmented governance, Japan risks repeating its history of fisher-led resource depletion, despite the ongoing efforts for sustainability-driven reform.

4.2. Use of FIPs and Certifications as External Review and Facilitation Tools

To increase opportunities to gain external, neutral inputs, the internationally recognized certification schemes and FIPs, which are increasingly widespread globally, can act as one approach for solution. Globally, FIPs have become vital for supporting sustainable fisheries in data-limited settings. They mobilize funding from industry, government, and donors, and provide technical assistance with policy advocacy, leading evidence-based policy making (EBPM). Research shows that FIPs improve the likelihood of avoiding overfishing and reaching sustainability targets (Cannon et al., 2018; Crona et al., 2019). However, long-term success depends on sustained support across sectors. Without such backing, many FIPs—and MSC certification efforts—fail to achieve their goals (Melnychuk et al., 2025;López-Ercilla et al., 2024).

In European coastal fisheries, the MedPath project provided a structured pathway toward sustainability by systematically applying the MSC Fisheries Standard as a benchmark. A total of 34 fisheries underwent pre-assessments, which served to identify specific gaps preventing them from meeting certification requirements and to clarify the areas in need of improvement (MSC, 2024). Building on these, improvement action plans were developed for 29 fisheries, many of which have already progressed to the implementation stage. These action plans have effectively functioned as Fishery Improvement Project (FIP)-like processes, offering a practical mechanism for fisheries to move closer to certification while embedding continuous improvement practices into management. This provides a compelling example of how the outcomes of this research may be operationalized, using the gaps identified in past pre-assessments as a foundational stage for launching comparable initiatives in Japan.

Criticism that Japanese fisheries are incompatible with MSC standards appear similar to historical objections to MSY in Japan. As Okamura observed in the context of Japan's experiences with MSY, the issue lies not in the framework itself but in the lack of efforts to find its practical application (Okamura, 2023). MEL certifications highly endorse existing multi-level governance structures and management plans to certify coastal fisheries in Japan. However, limited budgets and staffing prevent the assignment of species-specific experts or independent evaluations, resembling second-party certifications. It lacks transparency in authors' names and backgrounds, and the lack of evidence in assessment remains a hurdle for the certification system to be effective to promote improvements. MSC certification requires collecting and evaluating scientific evidence to assess whether each measure is effectively implemented—making the process more time- and cost-intensive. This deeper level of scrutiny reveals the institutional weaknesses outlined in Section 2. The existence of a framework alone does not guarantee its proper application or impact, which is precisely where independent and evidence-based international certification adds value. However, neither the government nor the fisheries sector alone can bear the full cost of the evaluations and improvements. Each certification scheme has both strengths and weaknesses, and to truly promote sustainable fisheries in Japan, it is necessary to retain the core elements of effective management while adapting the approach locally.

 doi:10.20944/preprints202508.1736.v2

5. Conclusion and Recommendations

Co-creation of well-designed, locally applicable FIPs or improvement pathways with stakeholder collaboration will foster a mechanism that aligns with Japan's revised Act and international expectations. However, certification standards must be adapted to allow the step-by-step efforts to be recognized, with financial and technical support extended. Localizing certification and improvement criteria without compromising scientific rigor can enhance feasibility and inclusiveness.

While not all fishers may be able to engage in improvement efforts, providing a supportive, incentivized framework for motivated actors provide a cost-effective alternative for government to mobilize private sectors to promote environmental recovery and position some fisheries as leaders for growth industry. This creation of transformational system resonates with the recommendation of the United Nations Food Systems Summit 2024, which calls for an urgent shift from fragmented, siloed approaches to a more integrated, systems-based framework (United Nations, 2023).

Strengthening small-scale fisheries evaluation methods through case studies developed by international organizations, as well as through dialogue with local stakeholders will be a key to developing practical, credible improvement systems. Advancing such research and fostering seamless coordination among international initiatives, Japan's fishing communities, market mechanisms, and policy frameworks could help unlock the potential for Japan's fisheries sector.

To address the challenge, following specific actions are recommended for each sector:

Table 2. Key Roles and Recommended Actions for Advancing Sustainable Fisheries Management in Japan.

Stakeholder Group	Recommended Actions
Government	- Establish clear consultation and decision-making guidelines for inclusive coastal management - Increase investment in scientific and coordination capacity for stock-based management and fishery management trainings. - Ensure institutional independence for science-based and ecosystem-based management - Support small-scale, multi-species fisheries through ecosystem monitoring and centralized data systems - Reform legal framework to strengthen co-management with clear roles and responsibilities.
Corporations	- Adopt sustainable sourcing policies - Provide funding for improvements via certification and FIPs - Review corporate impact on sourced products.
Academia	- Conduct solution-oriented research to the pressing real-world issues in collaboration with industry and diverse stakeholders.
Fisheries	- Become responsible steward of ocean, which is expected in exchange of the endowed coastal fishing rights in Japan. - Increase transparency and accountability for fisheries operations. - Participate in consultation processes from diverse positions. - Actively seek to learn methodologies of resources management to implement rules and regulations.
Consumers	- Support sustainable seafood through purchasing choices
Certification Scheme Holders	- *MEL*: Introduce external reviews to improve assessment neutrality and transparency in all processes. - *MSC and MEL*: Design locally appropriate improvement

 doi:10.20944/preprints202508.1736.v2

	pathways integrated with certification in collaboration with stakeholders. - Disseminate awareness that certifications and FIPs are tools to improve sustainability and requires the system to support improvement. - Facilitate science-based implementation with equitable stakeholder engagement - Share knowledge through user-friendly, centralized platforms for Japanese stakeholders
FIP Coordinators	
Financial Institutions & Funders	- Provide sustainability-linked financing - Support grassroots sustainability initiatives

Funding: This work was supported by JST SPRING, Grant Number JPMJSP2108.

Acknowledgments: The author expresses sincere gratitude to Jennifer Rasal MRes. at the Marine Stewardship Council for her valuable support and guidance in utilizing the public database, as well as for her contributions to improving this research. Deep appreciation is also extended to Dr. Mitsutaku Makino and Dr. Hiroki Wakamatsu for their generous support, supervision, and insightful comments throughout the writing and review process. The author further wishes to convey sincere respect and heartfelt thanks to the fishers and stakeholders who participated in the MSC assessments, which formed the foundation of this study.

Declaration of generative AI and AI-assisted technologies in the writing process.

During the preparation of this paper the author used ChatGPT 4.0 in order to improve the readability and language of the manuscript. After using this tool, the author reviewed and edited the content as needed and take full responsibility for the content of the published article.

Glossary

EBFM – Ecosystem-Based Fisheries Management
ETP species – Endangered, Threatened, and Protected species
FAO – Food and Agriculture Organization of the United Nations
FIP – Fisheries Improvement Project
FMO – Fisheries Management Organization
JFA – Japan Fisheries Agency
MEL – Marine Eco-Label Japan
MSC – Marine Stewardship Council
MSY – Maximum Sustainable Yield
RFA – Japan Fisheries Research and Education Agency
RMA – Resource Management Agreement
RMP – Resource Management Plan
TAC – Total Allowable Catch
TAE – Total Allowable Effort
UNCLOS – United Nations Convention on the Law of the Sea
UNEP – United Nations Environment Programme
UNESCO-IOC – Intergovernmental Oceanographic Commission of UNESCO

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