Assessing Forced Labor in the Distant Water Fishing Supply Chain

REPORT | **APRIL 2026**

PRODUCED FOR

U.S. Department of Labor
Bureau of International Labor Affairs
Office of Child Labor, Forced Labor, and Human Trafficking

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ACKNOWLEDGEMENTS

This report presents research on assessing forced labor in the distant water fishing supply chain. ICF prepared this report according to the terms specified in its contract with the U.S. Department of Labor. The research team would like to express sincere thanks to all the parties involved for their support and valuable contributions.

Funding for this research was provided by the U.S. Department of Labor under contract number GS-00F189CA and order number 1605C2-22-F-00060. This material does not necessarily reflect the views or policies of the U.S. Department of Labor, nor does the mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government. These studies were designed to help U.S. businesses map supply chains across multiple tiers and trace raw materials back to their sources, enabling them to detect likely risks and safeguard operations. By exposing where exploitative labor hides in global production networks, these studies contribute to efforts to strengthen supply chain resilience and level the playing field for American workers and businesses.

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GLOSSARY

Bagi hasil: An Indonesian term for a "profit-sharing" wage system in which fishing crew compensation is based on a share of catch value rather than fixed wages. This system is common in Indonesian fisheries and can facilitate wage manipulation and exploitation when calculations and deductions are opaque.

Beneficial owner/Ultimate beneficial owner: The individual or entity that ultimately controls and profits from a vessel's operations, even if not listed as the registered owner. Complex corporate structures often obscure beneficial ownership, making accountability difficult.

Benthic species: Species that live on, in, or very near the bottom of a body of water, such as cod or pollock.

Carrier vessel/Reefer: Refrigerated cargo vessels designed to receive catch from fishing vessels and transport it to processing facilities or ports. These vessels enable fishing vessels to remain at sea for extended periods by eliminating the need to return to port for offloading. They also facilitate co-mingling of catches from multiple vessels.

Catch documentation: Records and certificates that track seafood from catch to landing, including information on vessels, species, catch location, and quantity. They are required by many countries and Regional Fisheries Management Organizations.

Chain of custody: Documentation that tracks seafood products through each stage of the supply chain from catch to consumer, maintaining traceability to specific vessels or fishing operations. Robust chain of custody is necessary to identify and exclude forced labor-linked products.

Coastal state: A country with jurisdiction over its territorial waters and Exclusive Economic Zone (EEZ). Coastal states can regulate fishing activities and working conditions for vessels operating in their EEZs, regardless of the vessel's flag.

Co-mingling: The mixing of seafood from different vessels, fishing trips, or sources during transshipment, landing, cold storage, or processing. Co-mingling breaks vessel-level traceability and makes it practically impossible to distinguish forced labor-linked catch from other products without robust documentation systems.

Debt bondage: A form of forced labor in which workers are compelled to work to repay debts—often recruitment fees—under conditions in which the terms are disadvantageous and the worker cannot leave until the debt is repaid. It is common in distant water fishing through recruitment fee systems.

Demersal species: Fish species that live and feed on or near the ocean floor. Examples include snapper and grouper.

Distant water fishing: Fishing operations conducted by vessels operating in marine regions significantly distant from their home nation's territorial waters or EEZs, including on the high seas. These vessels engage in extended fishing voyages, often lasting from several weeks to two years, leveraging transshipment at sea to offload catches and resupply provisions.

Due diligence: The process companies undertake to identify, prevent, mitigate, and account for how they address adverse human rights impacts in their operations and supply chains. In the context of forced labor, this includes risk assessment, supplier verification, and remediation measures.

Flag of convenience: The practice of registering vessels in countries with minimal regulatory oversight and enforcement capacity to avoid more stringent labor, safety, and environmental regulations.

Flag state: The country where a vessel is registered. Under international law, the flag state is generally treated as having primary authority and responsibility over vessels flying its flag, particularly on the high

seas. Flag state authority is not exclusive; other states may exercise jurisdiction over the vessel in certain circumstances, such as when the vessel operates in another state's territorial waters or ports, or when port states conduct inspections under agreements like the Port State Measures Agreement. The flag state's laws and regulations apply to vessels flying its flag regardless of location, including requirements for labor standards compliance.

Groundfish: Species that live on, near, or are strongly associated with the seafloor, including both benthic species (e.g., cod, pollock) and demersal, bottom-associated fishes (e.g., snapper, grouper).

High seas: Ocean areas beyond any country's EEZ—extending beyond 200 nautical miles from coastlines. These areas cover nearly two-thirds of the world's oceans and are not under the jurisdiction of any single nation, making labor oversight particularly challenging.

High-throughput port: A major seaport handling massive volumes of cargo and vessel traffic. In the context of distant water fishing, these ports serve as key aggregation points at which catches from multiple vessels are landed, processed, and distributed into supply chains, often with limited traceability mechanisms.

Longlines/Longliner vessels: Fishing vessels that target high-value species like tuna and swordfish using miles of baited hooks suspended from a main line. The gear can extend for dozens of miles and requires intensive manual labor to set, monitor, and retrieve catches.

Manning agency: A recruitment agency that places crew members on fishing vessels. These agencies often charge recruitment fees to workers and serve as intermediaries between vessel operators and workers, particularly in the context of migrant labor recruitment. It is also referred to as a "crewing agency" in maritime contexts.

Manning contract: The employment agreement between a worker and a vessel operator, often arranged through a manning agency. These contracts specify wages, working conditions, and terms of employment, though actual conditions often deviate substantially from contractual promises.

Market state: Countries that import seafood products. Market states can exercise jurisdiction through import controls, including detention of goods produced with forced labor.

Mass balance: A traceability and verification method that compares the total quantity inputs entering a supply chain (e.g., raw fish from landings or farms) with the total quantity of outputs (e.g., processed products sold) over a defined period. The principle ensures that the amount of legally sourced product claimed in sales does not exceed what was actually received, accounting for yields, losses, and processing conversions.

Pelagic species: Fish species that live and feed in the open water column rather than on or near the seafloor. Examples include tuna, mackerel, sardines, and squid.

Port state: The country in whose port a vessel docks. Port states have jurisdiction to inspect foreign vessels entering their ports and can enforce certain labor and safety standards, providing an important enforcement mechanism for vessels that might evade flag state oversight.

Processing hub: Ports or coastal facilities with significant cold storage and seafood processing capacity that serve as aggregation points at which catches from multiple vessels are consolidated, processed, and distributed into supply chains.

Purse seines/Seine vessels: Fishing vessels that encircle schools of fish (especially tuna) with large nets that are then drawn closed at the bottom like a purse. These vessels typically target schooling pelagic species and can catch large volumes in single sets.

Segregation: Maintaining physical separation of different product streams (e.g., from different vessels/fisheries) throughout processing and distribution to maintain traceability; the alternative to mass balance approaches.

Seiners: Vessels that encircle schools of fish with nets and are similar to purse seines but may refer to different net configurations, depending on target species and fishing region.

Sending state: The country from which migrant workers originate. Sending states have jurisdiction over recruitment practices within their territory and may have authority to protect their nationals working abroad under certain circumstances.

Squid jigging vessels: Specialized fishing vessels that use automated jigging machines and bright lights at night to attract squid. Crews work intensive night shifts during peak squid seasons, often for months at a time.

Target vessels: A term used in this report to refer to vessels on which respondents experienced forced labor, as defined by the study's criteria.

Tied visa: Immigration status that links a worker's legal right to remain in a country to their specific employer or employment contract. This status creates vulnerability to exploitation because workers risk deportation if they leave abusive employers or report violations.

Toothfish: High-value deep-sea fish species, including Antarctic toothfish and Patagonian toothfish (often marketed as Chilean sea bass). They are the target of some distant water fishing operations in the Southern Ocean.

Transshipment/At-sea transfer: The transfer of fish or seafood products from one vessel to another—usually from a fishing vessel to a refrigerated carrier vessel or "reefer"—at sea or in port without formal landing. This practice is central to distant water operations but poses high traceability and labor risk concerns because it bypasses port inspections and enables vessels to remain at sea for extended periods. International frameworks, such as the Food and Agriculture Organization of the United Nations International Plan of Action on Illegal, Unreported, and Unregulated Fishing, the Port State Measures Agreement, and Regional Fisheries Management Organization measures, regulate transshipment due to its role in laundering illegally caught fish and obscuring labor conditions.

Trap setters: Vessels that deploy baited traps or pots on the sea floor to catch crustaceans (lobster, crab) and some groundfish species. Traps are retrieved after a soak time of hours or days.

Trawlers: Fishing vessels that drag heavy nets across the seafloor (bottom trawling) or through midwater (pelagic trawling) to catch groundfish, shrimp, and other species. These vessels can process and freeze catches on board.

ABBREVIATIONS

AIS	Automatic Identification System
C188	International Labor Organization Convention 188 on Work in Fishing (2007)
CBP	U.S. Customs and Border Protection
DWF	distant water fishing
EEZ	Exclusive Economic Zone
EU	European Union
FCF	Fong Chun Formosa Fishery Co., Ltd.
GFW	Global Fishing Watch
IDR	Indonesian Rupiah
ILO	International Labor Organization
IUU	illegal, unreported, and unregulated
KII	key informant interview
PPE	personal protective equipment
PSMA	Port State Measures Agreement
RFMO	Regional Fisheries Management Organization
SIMP	Seafood Import Monitoring Program
SIOFA	Southern Indian Ocean Fisheries Agreement
SPRFMO	South Pacific Regional Fisheries Management Organization
UBO	ultimate beneficial owner
UNCLOS	United Nations Convention on the Law of the Sea
WCPFC	Western and Central Pacific Fisheries Commission

EXECUTIVE SUMMARY

CONTEXT AND OBJECTIVES

This report investigates forced labor in the distant water fishing (DWF) supply chain, with a focus on Indonesian migrant fishers. Distant water fleets operate far from national jurisdictions, often on the high seas or in foreign Exclusive Economic Zones and supply global seafood markets. The study pursued two main objectives: (1) to assess forced labor risks in Indonesian migrant fisher recruitment, placement, and work on distant water vessels, with a regional focus on East Asian flagged and owned vessels; and (2) to trace seafood caught from vessels with reported incidents of forced labor and analyze impediments to tracing when they arise.

METHODOLOGY AND DATA COLLECTION

The research employed a mixed-methods approach, combining interviews with fishers in Indonesia and Taiwan; key informant interviews, including with representatives from government, unions, civil society, and industry; and secondary data review, including existing literature and production and trade data. Vessel identification and movement were verified using maritime databases and Automatic Identification System tracking data from Global Fishing Watch. The report draws findings from interviews with 125 Indonesian migrant fishers and 39 key informants from labor unions, international civil society organizations, and industry associations. In both Indonesia and Taiwan, access to workers was supported by worker unions and civil society organizations, and all workers were either currently employed in DWF or returned within the last year. Data collection took place from June to December 2025. The study's sampling method—purposive and snowball sampling—enabled a diverse pool of respondents but limits statistical representativeness.

The study operationalized the measurement of forced labor according to the guidelines provided in the 20th International Conference of Labor Statisticians' *Guidelines Concerning the Measurement of Forced Labour* (2018) and the International Labor Organization's *Hard to See, Harder to Count* (2024). According to these guidelines, a case of forced labor requires performing work that is both involuntary and under the threat or menace of a penalty.

KEY FINDINGS

The study found that forced labor is pervasive on DWF vessels, with **77% of respondents reporting experiences consistent with forced labor conditions,** based on the presence of both coercion and involuntary work indicators. Key findings include the following:

Forced Labor Indicators

- A total of 77% of respondents met the criteria for forced labor, with high rates of involuntary work (89%) and coercion (82%).
- Involuntary work indicators included onerous working hours or work schedule (65%), hazardous or degrading working conditions (51%), debt-linked recruitment (49%), inability to leave employment (35%), degrading living conditions (26%), low or no wages (13%), and deceptive recruitment (9%).
- Coercion indicators included abuse of isolation (62%); movement restrictions (45%); retention of cash, assets, or identity documents (36%); debt manipulation (29%); and abuse of vulnerability (24%).

Risk Factors for Forced Labor

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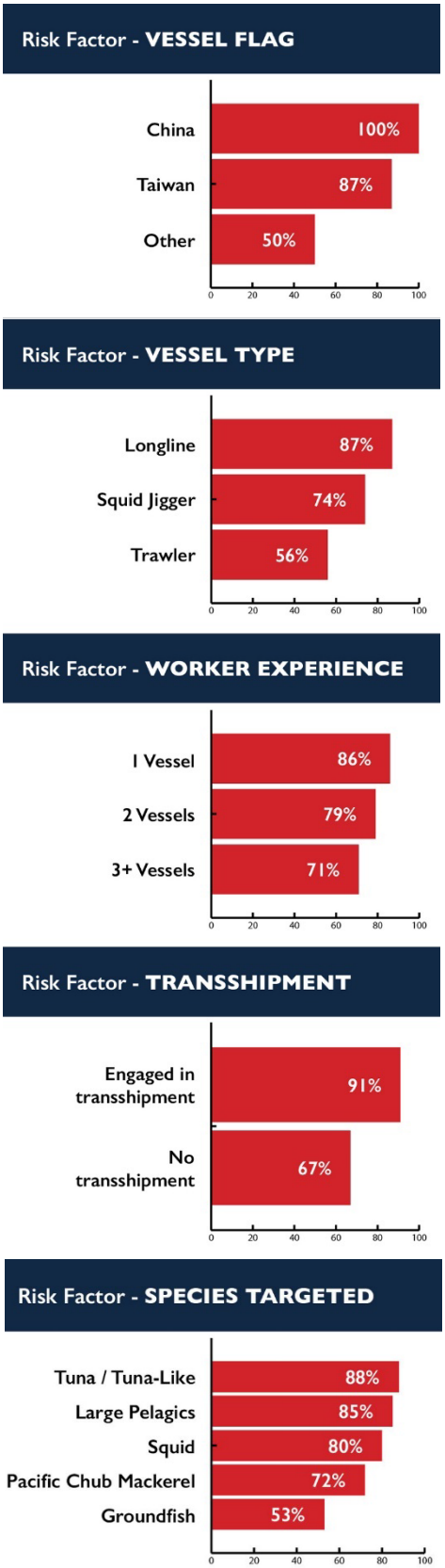
- Vessel flag: All workers on vessels flagged to China experienced forced labor, compared to 87% of workers on vessels flagged to Taiwan and 50% of workers on vessels flagged outside Taiwan or China (including Japan, Kenya, Malaysia, Micronesia, Portugal, South Korea, Spain, the United States, and Vanuatu).
- Vessel type: Workers on longline vessels had the highest forced labor rate (87%), followed by those on squid jiggers (74%). Those on trawlers had lower rates (56%).
- Lack of experience: Workers with less experience faced higher rates of forced labor; 86% of those with experience working on only 1 vessel experienced forced labor, compared to 79% of those with experience working on 2 vessels and 71% of those with experience working on 3 or more vessels.
- Transshipment (offloading catch to another vessel at sea): A total of 91% of those on vessels engaging in transshipment experienced forced labor, compared to 67% of those on vessels that did not engage in transshipment.
- Species targeted: Those targeting high-value species tended to have higher rates of forced labor. In this study, 88% of those targeting tuna and tuna-like species and 85% of those targeting large pelagics, such as swordfish and mahi-mahi, experienced forced labor, compared to 80% of those targeting squid, 72% of those targeting pacific chub mackerel, and 53% of those targeting groundfish, such as cod or grouper.

Living and Working Conditions

Recruitment

- Most fishers were hired through agencies and brokers in Indonesia, and many of these agencies are affiliated with other agencies in destination countries. Fishers often incurred high recruitment fees and debt (69% paid costs and 49% went into debt with their employer or recruiter). Among those who incurred recruitment-related debt to their employer or recruiter, the average recruitment cost was USD $672; 20% reported costs of USD $1,000 or higher, and 59% incurred costs exceeding one month's pay.
- Written contracts were standard, but 13% reported job conditions that did not match the conditions in the contract.
- A total of 14% of workers were required to provide their employer or recruiter with a security deposit that would be returned after the completion of the contract.

Risk factors for forced labor

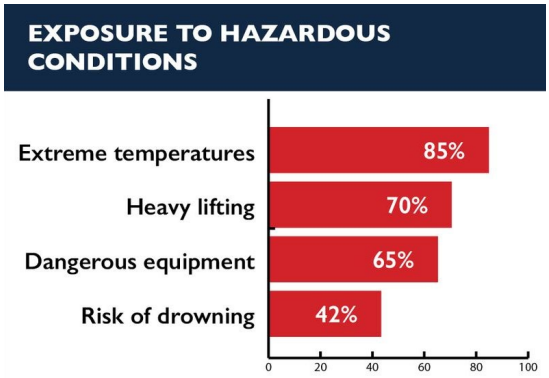


Earnings

- Median monthly earnings were USD $550; 19% earned less than USD $500/month.
- Payment arrangements varied: some fishers were paid in cash on board, others received wages via bank transfer (to their own account or that of a family member), and others collected pay from an agency in port. In some cases, fishers were paid through more than one method.
- More than half (60%) of workers were paid by their manning agent, 39% by the fishing company, and 11% by the vessel captain. Some workers received part of their payment from one source and part from another.
- Payment delays and wage arrears were common: 19% had difficulty accessing earnings, 11% experienced delays exceeding one month or delays related to low catch or vessel breakdowns, and some were owed more than a year's wages. Indirect payment transfers through manning agents often led to prolonged delays, unpaid wages, and obscured responsibility.

Working Conditions

- Most workers faced hazardous conditions, including extreme temperatures (85%), heavy lifting (70%), dangerous equipment (65%), and the risk of drowning (42%).
- Thirty-one percent reported injury or illness from work; many continued to work unless seriously unwell (e.g., vomiting or a severely infected wound).
- Among those facing risks, 42% reported that their employers did not provide the training needed to perform their jobs safely, and 12% indicated that their employer endangered their life by failing to take proper safety precautions.

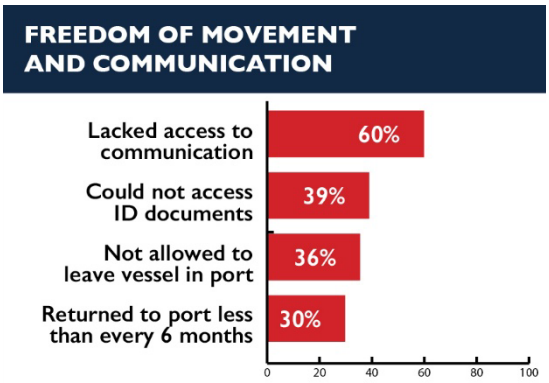


- Physical violence (6%) and verbal abuse (25%) were reported.
- A total of 60% worked more than 14 hours per day; 22% worked non-stop without breaks.

Living Conditions

- A total of 28% of respondents felt that their accommodations were harmful to their health, 11% did not feel safe in their sleeping quarters, and 13% did not have a safe space to store their belongings. The main concerns about sleeping quarters included vermin such as bed bugs and rats and excessive heat or cold.
- Twenty-seven percent reported feeling hungry due to insufficient food (severely limited rations). Fifteen percent reported lacking access to clean drinking water. (The actual risk may be higher, as some fishers who reported access to "clean" water relied on sources that may not be potable.)

Freedom of Movement and Communication



- A total of 60% *rarely or never* had access to communication with friends, family, and support organizations off ship due to no or limited Wi-Fi or other means of communication. Thirty-nine percent could not access identification documents in port if needed.
- Many returned to port infrequently (30% less often than every 6 months); 36% were not allowed to leave the vessel in port.
- Seventeen percent could not quit before contract end, often due to the requirement to pay for their own return ticket to Indonesia or debt. Twenty-six percent of workers with a defined end date worked beyond that date, often without a meaningful option to refuse, as they were still at sea.

Supply Chain Dynamics and Traceability

- Transshipment at sea is a common practice that makes it harder to track where the catch comes from and to record accurate data before the fish ever reach a port.
- Vessel tracking data indicated repeated visits to a small set of well-positioned hubs for unloading, services, and onward movement into processing and trade channels. This is a key finding, as companies can design due diligence activities that focus on these key ports.
- Once seafood is landed, it is frequently consolidated, co-mingled, packaged, and sold for domestic consumption or exported, making it practically impossible to distinguish forced labor-linked catch from other product lots.
- Traceability frequently degrades during processing through large industrial plants or hub ports, to the point that forced labor-linked catch cannot be distinguished from other product lots without robust vessel-level traceability and auditable chain-of-custody controls.
- Current voluntary systems used to identify forced labor, such as the Seafood Slavery Risk Tool or the Conservation Alliance for Seafood Solutions Human Rights and Social Responsibility Policy, are insufficient to mitigate the risk of co-mingling of seafood catch in ports, cold storage, and processing facilities, and by traders, thereby increasing the risk of catch from a vessel with forced labor conditions tainting downstream supply chains.

Legal Framework Versus Enforcement Reality

The weakness in enforcement arises from insufficient institutional capacity and political commitment, rather than absence of legal authority:

- Despite comprehensive statutory frameworks in China, Indonesia, and Taiwan prohibiting forced labor practices, systematic enforcement gaps persist across all examined jurisdictions.
- Flag states decline at-sea inspections, despite clear legal authority under the United Nations Convention Law of the Sea Article 94.
- Port states allocate inspection resources toward fisheries compliance rather than labor conditions.
- Sending states put insufficient resources toward compliance mechanisms for fishing sector recruitment violations.

CONCLUSION AND RECOMMENDATIONS

This study found that forced labor remains a pervasive concern in DWF operations employing Indonesian migrant fishers, driven by a complex interplay of economic, structural, and governance factors. The research documented systematic exploitation across multiple forced labor indicators in vessels operating across global fishing grounds. Findings suggest that despite comprehensive legal frameworks prohibiting such practices across multiple jurisdictions, enforcement failures enable widespread abuse to continue.

The DWF supply chain presents unique challenges for addressing forced labor. Once seafood enters the supply chain through transshipment or port landing, limited traceability mechanisms and systematic co-mingling of catches at various points in the supply chain make it nearly impossible to distinguish between seafood caught under forced labor conditions and other products without robust vessel-level documentation and chain-of-custody controls. This means that products made with seafood caught using forced labor are likely to permeate global seafood supply chains and enter major consumer markets.

Recommendations

To Flag State Governments:

- Establish mandatory at-sea inspection programs for DWF vessels, with inspectors trained to identify forced labor indicators.
- Implement requirements for vessels to maintain onboard Wi-Fi connectivity, enabling crew communication with families and authorities.
- Enforce penalties that effectively deter document retention, wage withholding, and retaliatory termination practices.
- Prohibit visa rules that link a worker's legal status to a specific employer, effectively facilitating deportation before workers can pursue remedies for labor violations.
- Regulate and oversee flag state–based recruitment and manning agents, including licensing, transparency requirements, and joint accountability mechanisms with sending state recruitment actors, to prevent fee charging, contract substitution, and wage manipulation across jurisdictions.
- Engage actively in Regional Fisheries Management Organization (RFMO) compliance and inspection mechanisms, including submitting labor-related findings to RFMO compliance committees and supporting the expansion of observer and inspection mandates to include labor conditions.
- Use bilateral agreements with sending states to operationalize labor standards, including joint inspection protocols, information-sharing arrangements, and clear responsibility for remediation when violations occur.

To Sending State Governments (Indonesia):

- Strengthen enforcement of existing zero-fee recruitment policies, with meaningful penalties for violations and accessible complaint mechanisms for workers at sea.
- Standardize wage escrow systems requiring direct electronic payment to workers' Indonesian bank accounts, with payment verification accessible before contract completion.
- Streamline pre-departure orientation programs providing workers with emergency contact information, rights awareness, and documentation of contract terms.
- Strengthen bilateral labor agreements with flag states by establishing minimum standards, inspection protocols, and remedy mechanisms.

To Port State Governments:

- Expand Port State Measures Agreement inspection protocols to explicitly include labor condition checks alongside fisheries compliance verification.
- Train port inspectors to identify forced labor indicators and provide access to confidential reporting channels for crew members.
- Negotiate with strategic countries to allow migrant fishers to access ports for key services (medical care, social services, and communications).
- Establish shore-side housing and support services, enabling crew members to disembark during port calls and access assistance if needed.
- Share labor violation information across port state jurisdictions and with relevant RFMOs to identify repeat offender vessels and beneficial owners.
- Adopt a no-tolerance anti-retaliation clause or policy with corresponding enforcement procedures.

To Market State Governments:

- Create an enabling environment for business due diligence (e.g., establish consistent expectations for industry accountability and due diligence in seafood supply chains), while also finding ways to reduce reporting burdens.
- Strengthen networks, protocols, and regional cooperation to obtain and share information across market state jurisdictions about forced labor cases in the seafood supply chain.
- Use the full weight of civil and criminal authorities to hold accountable companies and vessel owners engaged in forced labor.
- Advocate for the integration of binding labor standards into RFMO regions of oversight, building on successes such as the Western and Central Pacific Fisheries Commission's adoption of binding regional crew welfare standards (Conservation and Management Measure 2024-04).
- Leverage trade agreement negotiations to incorporate fishing labor recommendations and standards as enforceable and binding requirements for port states and flag states.[1]
- Establish public databases of vessels and beneficial owners with documented forced labor violations to inform enforcement actions.
- Support the development of technology solutions enabling real-time verification of working conditions and catch documentation.
- Issue civil penalties against importers who have been directly implicated in forced labor trade violations.
- Conduct regulatory audits of tuna, squid, and mahi-mahi importers to understand how they trace their supply chains, what information they rely on, and what steps they take to eliminate forced labor from these high-risk supply chains.
- Issue forced labor trade enforcement actions against entire fleets rather than individual vessels due to high risk of co-mingling among vessels through transshipment. Individual vessels easily change names and flags of convenience, making vessel-specific enforcement ineffective.
- Consider targeting forced labor trade enforcement actions against seafood processors that have been shown to repeatedly source seafood from vessels using forced labor.

[1] In February 2026, the United States and Taiwan signed the U.S.–Taiwan Agreement on Reciprocal Trade, which includes labor-related commitments relevant to Taiwan's commercial fishing sector, including improving protection of labor rights on commercial fishing vessels, addressing the charging of recruitment fees in certain sectors, prohibiting retention of workers' identity documents, strengthening enforcement of labor laws, and prohibiting the importation of goods produced with forced labor. See Office of the U.S. Trade Representative, "Fact Sheet on U.S.-Taiwan Agreement on Reciprocal Trade" (Feb. 12, 2026). These labor provisions are expected to be implemented on a phased timeline and to go into effect over the next three to five years, illustrating one way a market state can exert leverage through trade negotiations to advance fishing labor standards.

- Revive and implement action plans to enhance traceability expansion and strengthen government ability to address illegal, unreported, and unregulated fishing activities and combat forced labor in seafood supply chains.
- Encourage alignment between trade enforcement actions and RFMO compliance outcomes, so vessels and fleets flagged in one system face consequences across others.

To Private Sector Actors:

Given the prevalence and pervasive nature of forced labor in DWF fleets, seafood buyers throughout the supply chain, including processors, brands, importers of record, and retailers, should collaborate to enact intensive and comprehensive programs to identify and remedy forced labor throughout seafood supply chains. The risk is particularly high with regard to tuna, squid, and other large pelagics like mahi-mahi. Given the extent of recommended reforms, companies should take a phased approach. The following remediation program should apply to all personnel aboard DWF vessels and should cover all stages of the employment cycle (recruitment, employment, and separation).

Worker Protection and Safety

- Implement and enforce a zero-tolerance standard against physical abuse, threats, harassment, intimidation, retaliation, and improper surveillance of workers.
- Ensure immediate access to medical care, adequate food, clean drinking water, required medications, and hygienic living spaces free from pests or unsafe conditions.
- Provide workers with appropriate job training prior to vessel onboarding and personal protective equipment suited to all tasks, and maintain clear emergency procedures for medical crises and man overboard events.
- Keep all vessel tracking systems (e.g., Automatic Identification System) continuously active to improve safety, transparency, and accountability.

Communication and Grievance Access

- Provide unrestricted, confidential Wi-Fi for all crew members; return any confiscated phones and supply devices.
- Maintain a fully independent, multilingual grievance channel available 24/7, capable of documenting, investigating, and resolving complaints without retaliation.

Living and Working Conditions

- Align onboard living and working conditions with widely recognized labor norms, including adequate hours of rest, proper accommodation, safe food handling, and access to health and safety protections.
- Ensure that workers can move freely on board and during port calls, with reliable access to shore leave.
- Provide secure storage for identity documents and valuables and strictly prohibit confiscation at all times.

Fair Employment and Compensation

- Repay all recruitment fees paid by workers, along with any withheld, unpaid, or improperly deducted wages.
- Provide workers with clear, written contracts in their native languages explaining pay, duties, living conditions, benefits, repatriation terms, and port call expectations.
- Maintain transparent payroll systems with accessible, verifiable records and paystubs that workers can easily review.

Recruitment and Oversight

- Minimize reliance on intermediary recruiters to reduce risk and increase accountability.
- Conduct independent worker interviews to identify issues, assess risks, and verify working conditions.
- Maintain accurate crew lists, including nationality, job roles, and length of time on board.

Monitoring of Vessels and Working Conditions

- Carry out independent inspections of vessels, of both living and working areas, especially during port visits where access is easier.
- Avoid using onboard cameras or monitoring technologies to discipline workers, surveil breaks, or restrict movement.

Traceability and Supply Chain Integrity

- Avoid aggregated or mass balance traceability approaches that obscure vessel-level details.
- Eliminate reliance on paper records or self-disclosed information; instead, adopt secure digital systems, such as blockchain, that validate vessel identity, catch records, and activity.
- Prioritize sourcing from vessels with a verified history of compliance and avoid vessels known for frequent name or ownership changes.

To Civil Society and Other Stakeholders:

Civil society and other stakeholders have established a foundation for identifying and supporting fishers subject to forced labor conditions. However, these stakeholders may wish to consider a unified approach to the following issues:

- Provide resources to worker support centers in major fishing ports that provide legal assistance, translation services, and confidential reporting channels to fishers. This may increase the impact and coverage of programming.
- Strengthen systematic documentation of forced labor cases and share findings in unified databases, allowing advocates access to use with enforcement authorities across multiple jurisdictions.
- Advocate for strengthened international frameworks explicitly addressing labor conditions in fishing vessel inspections.
- Support research on beneficial ownership structures and recruitment networks enabling forced labor in DWF operations.
- Develop uniform approaches and standards to verify forced labor remediation for fishers, such as repayment (recruitment fees, unpaid wages, etc.), return of identity documents, and improved working and living conditions.

Implementation of these recommendations requires coordinated effort from all stakeholders across the private sector, civil society, flag states, sending states, port states, and market states. Progress in eliminating forced labor from the DWF sector will require addressing both immediate labor violations and underlying governance failures that enable exploitation to persist despite comprehensive legal prohibitions.

1. INTRODUCTION

Distant water fishing (DWF) vessels play a crucial role in global seafood supply and international trade. DWF fleets consist of fishing vessels that operate far from their home nation's territorial waters, including on the high seas (Tickler et al., 2018a). These high seas areas extend beyond 200 nautical miles from coastlines and encompass nearly two-thirds of the world's oceans (Food and Agriculture Organization of the United Nations, 2024). Voyages frequently last six months to over a year.

DWF began expanding in the mid-20th century, driven by technological advancements, changes in international law, and the depletion of nearshore stocks. When countries established 200 nautical mile Exclusive Economic Zones (EEZs) under the United Nations Convention on the Law of the Sea (UNCLOS) in 1982, vast coastal areas that foreign fleets had long depended upon were placed under national control. As a result, fishing fleets had to travel farther from their home countries to maintain catch levels. Mechanization started gradually with improvements in refrigeration and processing equipment, then accelerated sharply in the 1990s and 2000s with the introduction of industrial fishing gear and new practices such as transshipment, which allowed vessels to transfer their catch to other vessels while still at sea. These shifts were driven by the expansion into high seas fishing and enabled fishing boats to operate for months or even years without returning to port, greatly extending their time on the water. Altogether, this has led to a dramatic increase in total catches of oceanic species since the 1950s, rising from about 1 million metric tons to roughly 11 million metric tons by 2022.

Mechanization has improved efficiency, but DWF still relies heavily on migrant labor, including tens of thousands of Indonesians deployed annually. Despite international laws, investigations since the mid-2010s have revealed widespread forced labor on distant water fleets, with documented abuses including debt bondage, violence, and deaths at sea.

This study was designed to examine labor conditions among Indonesian migrant fishers employed on DWF vessels. The research had two primary objectives:

- To assess forced labor risks in Indonesian migrant fisher recruitment, placement, and work on vessels, with a regional focus on China- and Taiwan-flagged vessels
- To attempt to trace seafood caught from vessels with reported incidents of forced labor and analyze impediments to tracing when they arise

1.1 DISTANT WATER FISHING: ECONOMIC OVERVIEW

Industrial DWF fleets harvest millions of metric tons of catch annually, contributing significantly to the estimated $186 billion international trade in aquatic products (United Nations Trade and Development, 2024). This activity supports a global seafood market projected to exceed $387 billion in 2025 (Fortune Business Insights, 2025).

A handful of nations dominate the sector: China and Taiwan account for approximately 60% of the DWF effort (Orlowski, 2019), and Japan, South Korea, and Spain are among other major players (Yozell & Shaver, 2019). China, in particular, has emerged as the principal actor. An analysis of shipping data from 2022 to 2024 showed that China conducted 30% of all high seas fishing during that period—an exponential expansion since the launch of its first DWF fleets in 1985 (Oceana & Urbina, 2025). China's DWF fleets have also been reported to serve strategic and military-related functions, including maritime surveillance (Urbina, 2023).

The United States imports 65–85% of the seafood it consumes, and distant water fisheries are the main source of tuna, squid, and other high-value seafood products for American consumers (Ferreira et al., 2022).

Tuna represents the most economically significant component of DWF operations. Global tuna production reached approximately 7 to 8 million metric tons annually in recent years.[2] These fleets supply major importers, including the United States, Japan, and the European Union (EU), underpinning multi-billion dollar seafood markets. In 2023, global tuna catch composition remained heavily weighted toward skipjack (57%) and yellowfin (31%) (International Seafood Sustainability Foundation, 2023).

Beyond tuna, squid also holds considerable economic significance within DWF operations. In 2020, squid and related species accounted for approximately 4.3% of global marine capture volume and 7% of total catch value (Aroni, 2020; Food and Agriculture Organization of the United Nations, 2022). Industrial DWF fleets from East Asia harvest these highly migratory species across the Pacific, Atlantic, and Indian Oceans, linking distant ocean production to high-demand markets in Europe, East Asia, and North America. Italy, Japan, China, Thailand, and the United States are significant importers both in terms of overall value and quantity (Ospina-Alvarez et al., 2022).

DWF fleets are also essential for other high-value species, such as Chilean sea bass, deep water shrimp, Patagonian scallops, and certain demersal finfish (Commission for the Conservation of Antarctic Marine Living Resources, 2023; Food and Agriculture Organization of the United Nations, 2022). Although these species are lower in volume than tuna or squid, they command premium prices, generating substantial revenue for distant water operators (Food and Agriculture Organization of the United Nations, 2022). By providing access to species unavailable to coastal fisheries, DWF attracts private sector actors incentivized to profit from global seafood demand.

1.2 LABOR DYNAMICS IN DISTANT WATER FISHING

Although mechanization has improved catch efficiency, fishing operations continue to require substantial human labor for gear deployment, catch handling, processing, and vessel maintenance. The complexity of modern fishing gear—miles-long longlines requiring manual baiting and retrieval, purse seines demanding coordinated deck operations, squid jigging equipment needing constant monitoring—has in many cases increased rather than decreased the physical demands on the crew. Migrant workers provide much of this labor, driven by several factors. In countries operating these fleets, few local workers are willing to take on the demanding and sometimes risky work at sea for the wages offered. Consequently, companies frequently recruit workers from Southeast Asia, where limited alternatives lead many to seek employment in fishing (Davidson & Lin, 2025).

Indonesia is one of the world's largest suppliers of migrant labor to the global fishing industry, with tens of thousands of Indonesian fishers deployed annually on DWF vessels operating across the Arctic, Atlantic, Indian, and Pacific Oceans (Greenpeace, 2024). Indonesians typically occupy the lowest ranks and perform the most physically demanding tasks, such as baiting thousands of hooks on longliners, hauling heavy nets on purse seiners, or working overnight shifts on squid jiggers (Davidson & Lin, 2025).

Until the mid-2010s, concerns about labor exploitation on DWF vessels received limited attention from regulatory authorities and international organizations. Beginning in the mid-2010s, however, the sector came under increasing scrutiny as investigations by civil society organizations, journalists, and government agencies documented widespread and systematic forced labor conditions. Between 2014 and 2025, Destructive Fishing Watch Indonesia and the International Labor Organization (ILO) recorded more than a thousand complaints from returning distant water fishers alleging severe abuse (Destructive Fishing Watch Indonesia, 2025; International Labour Organization, 2025). Investigations documented dozens of deaths at sea under conditions analogous to modern slavery on vessels from China, Taiwan, South Korea, and other nations (Chen et al., 2024; Cheung, 2025; Chiang, 2023; Davidson & Lin, 2025;

[2] In 2023, global landings of the 7 principal tuna species—skipjack, yellowfin, bigeye, albacore, and the three bluefin species—generated an estimated $40.93 billion in end market value, rising further in 2024 as international tuna trade increased 28% in quantity and 3.32% in value compared to 2023 (FAO, 2025; Research and Markets, 2024).

Tsai, 2025). In particular, multiple investigations by the Environmental Justice Foundation, Greenpeace, and other organizations have documented severe and systemic labor abuses on DWF vessels flying Chinese and Taiwanese flags (Environmental Justice Foundation, 2024b, 2024a; Greenpeace, 2021, 2024; Taiwan Association for the Promotion of Human Rights, 2025).

Despite increasing international attention and the existence of comprehensive legal frameworks prohibiting forced labor in multiple jurisdictions, concerns about labor exploitation persist. Reported forced labor indicators include debt bondage; document confiscation; excessive working hours; inadequate food, water, and medical care; restrictions on movement; restrictions on communication; and physical abuse (Davidson & Lin, 2025; Global Fishing Watch, 2024; Greenpeace, 2021; Greenpeace, 2024). Physical abuse and intimidation are common enforcement mechanisms, with testimonies describing beatings with hooks or metal rods, confinement in storage rooms, and threats of death for disobedience (Davidson & Lin, 2025). In extreme cases, Indonesian fishers have died at sea from untreated illness, injury, or malnutrition, including documented cases of beriberi on squid vessels on which captains failed to provide adequate food or medical care (Davidson & Lin, 2025; Greenpeace, 2021). Bodies have been discarded overboard or stored in freezers to avoid disrupting fishing operations (Davidson & Lin, 2025). Between 2022 and 2024, multiple high-profile cases resulted in prosecutions and regulatory actions, yet systematic exploitation continues across the sector (Chen et al., 2024).

This report consists of four sections. Section 1 introduced the context and objectives of the study. Section 2 provides a detailed account of the study's methodology and its limitations. Section 3 explores the legal and regulatory framework, profiles respondents and their vessels, and examines working and living conditions at sea. It also analyzes supply chain dynamics and risk pathways that enable forced labor to persist. Finally, Section 4 provides a conclusion and policy recommendations.

2. METHODOLOGY

The study was designed to address the following research questions:

- What are the indicators for and extent of forced labor for Indonesian migrant fishers on distant water vessels globally, with a regional focus on China- and Taiwan-flagged vessels?
- Which fleets and individual vessels are connected to forced labor conditions experienced by Indonesian fishers?
- In which destination markets is seafood sourced with forced labor more likely to appear, and in what product form are these goods usually sold? To what extent is it possible to directly trace seafood procured with forced labor to final destination markets?

This study employed a mixed-methods approach, integrating secondary data analysis, worker interviews, and key informant interviews (KIIs) to examine forced labor in the DWF sector and to conduct direct tracing to identify the vessel, captain, vessel owner, type of catch, national destination of sold catches, any downstream processing, and domestic consumption or export trends.

Secondary data review: The research process began with a thorough review and analysis of existing literature, including media reports, industry publications, academic articles, and production and trade data. This desk research provided a foundational context on labor conditions, recruitment practices, and supply chain structures associated with Indonesian migrant fishers. Insights from this review informed both the study and the final analysis.

Worker interviews: Respondents were identified using local organizations and a snowball sampling approach. Interviews were conducted in two main settings: (1) with fishers who had returned from fishing trips, either while they were in transit through dormitories or in their home villages; and (2) with fishers who were still working, interviewed during docking times in harbors. The study focused on locations with high numbers of migrant fishers, including Central Java, North Sulawesi, North Sumatra,

and East Nusa Tenggara in Indonesia, as well as Donggang, Siokang, and Kaohsiung harbors in Taiwan. Interview sites were chosen to ensure privacy, security, and participant comfort.

The interviews combined closed-ended and open-ended questions and were administered on hand-held tablets using the SurveyCTO platform. Automated skips and filters ensured that interviewers only saw relevant follow-up questions, reducing fatigue for both respondents and interviewers. Responses to closed-ended questions were recorded directly on the tablet, and open-ended responses were captured through audio recordings. The interviews collected information on socio-demographic characteristics, recruitment experiences, work activities, and indicators of forced labor. All participants had worked as migrant fishers on distant water vessels within the previous 12 months, and work-related questions referred to their most recent job. The final analytic sample included 125 fishers.[3]

Interviewer training in Manado, North Sulawesi, Indonesia. Source: ICF

KIIs: KIIs were conducted with 39 stakeholders selected for their expertise in legislation, labor rights, fishing operations, and supply chain dynamics. Interviews were held both in person and virtually in Indonesia and Taiwan, as well as virtually with global experts. Additional key informants were identified through a snowball sampling approach.

Of the 39 KIIs, 20 focused on supply chain dynamics, targeting seafood sector stakeholders involved in processing, transportation, sourcing, or advising on global seafood trade. These stakeholders included processors, port authorities, importers, academic institutions, environmental and social standards organizations, and labor rights investigators. Interviews prioritized stakeholders connected to the U.S. market and actors engaged in the trade of species referenced in worker interviews.

The remaining 19 KIIs examined labor conditions and included government officials, academics, journalists, civil society representatives, Fishery Improvement Project implementers, labor provider associations, and union representatives.

All instruments were translated into Bahasa Indonesia, tested, and revised based on pilot and field feedback.

When participants consented, worker interviews and KIIs were audio recorded and transcribed; otherwise, detailed notes were taken. All transcripts were translated into English for analysis. All personally identifying information was removed prior to analysis to protect respondent confidentiality. The research team analyzed quantitative data using Stata and Microsoft Excel. Qualitative data from transcripts were systematically coded and analyzed to identify patterns. Findings were triangulated

[3] Researchers interviewed 135 Indonesian migrant fishers—101 in Indonesia and 34 in Taiwan. Of these, 125 fishers' responses were included in the qualitative analysis, and 124 in the quantitative analysis. Ten participants were excluded from both analyses because, although they initially identified as distant water fishers, their responses showed that they returned to shore more frequently than every two weeks, which did not meet the study's definition of DWF. In addition, one fisher was excluded from the quantitative analysis because his responses combined experiences from multiple jobs, rather than focusing solely on his most recent position as required by the study.

across multiple data sources—worker interviews, vessel tracking data, and KIIs—to ensure that conclusions were supported by converging lines of evidence.

2.1 MEASURING FORCED LABOR

This study uses the definition of forced labor contained in ILO Convention 29: "The term forced or compulsory labor shall mean all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily." The study operationalizes this definition of forced labor according to the guidelines provided in the 20th International Conference of Labor Statisticians' *Guidelines Concerning the Measurement of Forced Labor* (2018) and the ILO's *Hard to See, Harder to Count* (2024).

According to the guidelines, a case of forced labor requires performing work that is both involuntary and under the threat or menace of a penalty. *Hard to See, Harder to Count* (2024) describes three employment stages: recruitment stage, employment stage, employment separation stage. For this study, a worker must have experienced both involuntary work and coercion during the same employment stage to be classified as a case of forced labor.

See Appendix 6 for the full text of the worker instrument used in this study and Appendix 7 for a mapping of questions to indicators.

2.2 SUPPLY CHAIN TRACING METHODOLOGY

To meet the objective of this study to trace seafood caught from vessels with reported incidents of forced labor, researchers attempted to identify the vessels worked on by workers the study identified as experiencing forced labor. Researchers started with a list of vessel names provided by workers. They checked each name in online ship databases (MarineTraffic and VesselFinder) and confirmed the vessel's identity by matching key details like the country of registration and the type of fishing gear used. If there were spelling or translation differences, the team searched for possible alternatives and checked for cases in which vessels might have changed names or flags. Only vessels that could be confidently identified were included in the analysis.

Once identified, researchers tracked vessel movements using global monitoring tools, primarily Global Fishing Watch (GFW), which integrates Automatic Identification System (AIS) data. AIS is a satellite-based system that transmits a vessel's position, speed, and course in real time, enabling authorities and researchers to monitor vessel activity across oceans. This technology is widely used for maritime safety and fisheries oversight because it provides a continuous record of vessel movements, including fishing activity and port visits.

Using AIS data through GFW, the team analyzed where these vessels traveled and where they stopped for extended periods, focusing on significant port visits. They also looked for signs of transshipment—when catch is transferred between vessels at sea—by combining worker reports with AIS-based tracking data. For more details on these methods, see Appendix 2: Methodology Supplement: Identifying Vessels and Documenting Vessel Movement.

To trace seafood supply chains, the study focused on vessels "flagged to" or owned by entities in China, Taiwan, South Korea, Japan, and Spain. A vessel is "flagged to" a country when it is officially registered there and operates under that country's laws and regulations. These nations maintain the most expansive DWF operations globally, with a fishing vessel flag state identity that is consistent, verifiable, and stable across multiple authoritative data sources. The fishing fleets of Taiwan, China, South Korea, and Spain have continuously expanded their mean distance to fishing grounds by at least 2,000 km since the 1950s, with Taiwan, China, and South Korea now fishing, on average, more than 3,000 km from their home ports (Tickler et al., 2018b).

These flag states were selected for several reasons. First, they represent the primary destinations for Indonesian migrant labor in the DWF sector. Second, their operations have attracted significant scrutiny due to documented cases of labor abuses, including forced labor and trafficking, predominantly affecting migrant laborers sourced from Indonesia (Park et al., 2023; Selig et al., 2022). Third, unlike vessels operating under flags of convenience—which account for nearly 30 countries and create verification challenges (Park et al., 2023; Selig et al., 2022)—these flag states maintain genuine links to their vessels, enabling more reliable identification and tracing of vessel operations and supply chains.

2.3 TRAINING AND PREPARATION

The local data collection team received comprehensive training on instrument content, ethical guidelines, and data collection procedures. Interviewer training for data collection in Indonesia was carried out in Manado, North Sulawesi, followed by instrument piloting in Lembeh Island, Bitung, North Sulawesi, in June 2025. The training comprehensively covered the study's objectives, the definition and indicators of forced labor, research design, fieldwork procedures, confidentiality, informed consent protocols, and data quality assurance. The team also participated in a detailed review of the research tools and mock interviews, with feedback sessions aimed at refining interview techniques.

Interviewer and supervisor of interview team at a pilot interview on Lembeh Island, North Sulawesi, Indonesia. Source: ICF

The pilot phase allowed research leads to observe interviewers, provide feedback, and assess the initial plan of conducting quantitative surveys followed by qualitative interviews. During debriefing, the team found that fishers were already sharing detailed experiences during the quantitative portion, so they integrated qualitative prompts into the main survey and, with participants' consent, audio recorded responses. This approach encouraged richer storytelling while maintaining structure. The pilot also led to minor adjustments in question wording and translation.

Interviewer training for data collection in Taiwan was carried out in Kaohsiung, Taiwan, in September 2025. This was followed by pilot interviews, as well as debriefing and feedback on interviews and lessons learned.

In both Indonesia and Taiwan, access to participants was supported by worker unions and civil society organizations. In Indonesia, interview teams commonly relied on these stakeholders' networks to connect with fishers who had recently returned from voyages. In Taiwan, where fishers were based in port areas, interviewers drew on established relationships with unions and civil society organizations and conducted interviews in recreational spaces provided by these organizations. Prior to data collection, ICF's independent Institutional Review Board approved the study's research design and instruments. The research was performed in compliance with 45 Code of U.S. Federal Regulations Part 46 on the Protection of Human Subjects.

2.4 DATA COLLECTION

Data collection began in June and continued until December 2025. A total of 135 worker interviews were conducted, with 125 ultimately used for analysis (see Section 2, Methodology). A total of 39 key informants were interviewed using semi-structured interview guides tailored to each respondent's expertise and role.

2.5 CHALLENGES AND LIMITATIONS

Sampling method: The study used purposive and snowball sampling rather than probability sampling to identify workers for interviews, allowing for a diverse pool of respondents but also introducing limitations. Findings are not statistically representative of the DWF industry or its labor practices. Despite these limitations, the data help identify the existence of forced labor in the industry and, when combined with qualitative insights, offer a broader understanding of the issue.

Accessing fishers: Conducting interviews with fishers presented several logistical challenges. In Central Java, some fishers lived in villages or housing complexes that also housed large numbers of migrant workers recruited for various industries. This required careful planning to avoid raising suspicion among recruiters during fieldwork and to ensure the safety of both interviewers and fishers. Availability was another major constraint. In Indonesia, fishers who were accessible were often in transit—either returning home after a trip or preparing for their next departure—while those who had permanently left the industry were much harder to locate. In Taiwan, interviews were scheduled during fishers' limited afternoon free time, but many declined to participate because they were occupied with other activities.

Interview with a fisher in Central Java, Indonesia. Source: ICF

Traceability: Tracking vessels and products in the supply chain introduces several challenges. Vessel identification is complicated by variations in naming and romanization across registries and platforms. AIS data, which are used to monitor vessel movements, can be unreliable due to gaps in coverage, inconsistent signal reception, and signal spoofing (a practice in which vessels deliberately transmit false location data to hide their actual position or activities). Supply chain transparency is also limited because products are often co-mingled at sea or during land-based processing, making it difficult to trace them back to a specific vessel or lot.

The study's findings rely on industry cooperation for interviews and data sharing, but available information can be incomplete, outdated, or restricted behind paywalls. Access to government import and export records with company identifiers varies by country, which limits the ability to fully verify ownership, transportation routes, and buyers. As a result, vessel attribution, port histories, and end market connections presented in this report should be considered conservative estimates rather than comprehensive accounts.

These considerations provide important context for the findings presented in the next section.

3. FINDINGS

This section presents the empirical findings from worker interviews and related analyses, examining the presence of forced labor and how risk varies across various characteristics. Overall, **77% of workers experienced forced labor.** Although rates of forced labor varied only modestly by characteristics such as age, education, and primary work activity, more pronounced differences emerged by birthplace, experience level, and operational characteristics of vessels and fisheries.

Key patterns related to forced labor in the sample include the following:

- **Birthplace:** A total of 73% of respondents born in Java experienced forced labor, compared to 89% of those born in Sumatra. Within Java, 68% of those born in Central Java reported forced labor, and all 11 (100%) of the respondents born in West Java reported forced labor.
- **Level of experience:** Forced labor was experienced by 86% of workers who had worked on only 1 vessel, compared to 79% of those who had worked on 2 vessels and 71% of those with experience on 3 or more vessels.
- **Vessel type:** The lowest rate of forced labor was observed on trawlers (56%); squid jiggers showed a higher rate (74%), and longline vessels had the highest rate of forced labor (87%).
- **Vessel flag:** Half (50%) of workers on vessels flagged outside Taiwan or China experienced forced labor, compared to 87% of those on Taiwanese vessels and 100% of those on Chinese vessels. All 21 respondents on Chinese-flagged vessels experienced forced labor.
- **Species of catch:** Workers on vessels targeting tuna and tuna-like species reported the highest rate of forced labor (88%), followed by those catching large pelagics (85%) and squid (80%). Vessels targeting Pacific chub mackerel had a lower rate (72%), and the lowest rate was among those catching groundfish (53%).
- **Transshipment:** A total of 91% of respondents involved in transshipment—offloading catch to another vessel while at sea—experienced forced labor, compared to 67% of respondents who did not engage in transshipment. See Section 3.5.2.2, Transshipment, for further discussion.

The remainder of this section expands on these headline findings, moving from contextual background to detailed analysis of labor conditions and risk pathways. Section 3.1 examines the legal and regulatory frameworks that shape labor conditions, highlighting gaps between statutory protections and enforcement. Next, the characteristics of the sample and the vessels on which they worked are profiled in Section 3.2, followed by a detailed analysis of working and living conditions across the sample, including recruitment practices, payment systems, exposure to hazards, and restrictions on movement and communication in Section 3.3. Section 3.4 synthesizes these characteristics within the forced labor analytical framework and presents detailed rates of indicators of involuntary work, coercion, and forced labor. Finally, Section 3.5 traces forced labor risk through seafood supply chains, tracing how seafood caught under forced labor conditions moves from harvest through transshipment, port aggregation, processing, and export, with attention to traceability challenges and regulatory pressures.

3.1 LEGAL AND REGULATORY CONTEXT FOR DISTANT WATER FISHING LABOR CONDITIONS[4]

This section examines the international legal architecture, domestic legal protections in major flag and sending states (China, Taiwan, and Indonesia), the overlapping jurisdictional frameworks that theoretically provide multiple enforcement pathways, and the fundamental enforcement failures that enable labor abuses to flourish. Understanding this legal architecture is essential for interpreting the

[4] For a thorough discussion of the international and domestic legal frameworks relevant to DWF, and how they overlap, interact, and contribute to enforcement gaps in this area, see Appendix 4.

labor conditions documented in this study, as it reveals that exploitation persists not due to the absence of protective laws, but due to a systematic failure to enforce them.

3.1.1 Flag States and Beneficial Ownership

The flag state of a vessel is the country where the vessel is registered and licensed, indicating the national laws and regulations to which the vessel is subject. Therefore, the flag state of a vessel is a critical factor of supply chain forced labor because it shapes regulatory requirements, inspection frequency, reporting obligations, and enforcement capacity of a vessel, while also influencing how easily vessels can shift identity, ownership structures, or operating jurisdictions (Kinds et al., 2025; Pew Charitable Trust, 2023).

Complex ownership structures complicate jurisdictional clarity, enforcement, and traceability because the entities that appear in vessel paperwork are often not the entities that direct operations (Park et al., 2023) (Figure 1). Oceana's "Beyond the Flag" usefully distinguishes between the registered owner and top-tier legal owners and emphasizes that the ownership chain ultimately ends with beneficial owners (Kinds et al., 2025; Oceana, 2025). This nested ownership framework illustrates how ownership can be distributed through registered owners (e.g., shell companies or corporate vehicles) and legal owners (e.g., joint ventures or corporate agreements) across jurisdictions, making enforcement and sanctions difficult, even when abuses are documented at sea. Across distant water fisheries, an ultimate beneficial owner (UBO) controls the vessel and ultimately profits the most from a vessel's operations and catch. However, the UBO is often not the same as the person or entity listed on vessel registries or supply chain paperwork because they are not the registered owner listed on licensing or registration forms (Daniels, A. et al., 2022a; Pew Charitable Trust, 2023). Tracing profits in commercial fishing is nearly impossible in many cases because large-scale operators can use layered corporate structures that obscure ownership.

Figure 1. Nested ownership of DWF vessels

Opaque ownership complicates labor and traceability due diligence because brands, traders, and independent assessors can trace seafood to a flag state and landing port, but not reliably to the individuals and corporate groups controlling vessel operations. Vessels can present one jurisdiction through their flag state or ownership registry, while operational control may be linked to other national jurisdictions through captains and UBO structures.

3.1.2 International Legal Framework

The ILO Forced Labor Convention (1930) and its 2014 Protocol prohibit forced labor and require states to take effective measures for prevention and elimination. These

instruments have achieved near-universal ratification, including by major DWF nations. The Palermo Protocol (2000) provides the internationally recognized definition of human trafficking, which requires three elements: an act such as recruitment, transportation, or harboring; a means such as force, deception, abuse of vulnerability, or debt bondage; and a purpose, namely exploitation, including forced labor. Both China and Indonesia have ratified the Palermo Protocol, but Taiwan's exclusion from United Nations membership prevents it from formally acceding to United Nations treaties. However, Taiwan has passed anti-human trafficking legislation modeled after the Palermo Protocol called the Human Trafficking Prevention Act (2023). Despite these frameworks, enforcement within the fishing sector remains weak, and the instruments lack guidance tailored to the unique conditions of this industry.

ILO Convention 188 on Work in Fishing (2007) (ILO C188) establishes minimum standards for conditions of service, accommodation, safety, and medical care aboard commercial fishing vessels. However, only 24 countries have ratified it as of December 2025—critically excluding China, Indonesia, Taiwan, South Korea, and Japan, which represent the world's largest DWF fleets. Thailand remains the only Asian nation to have ratified it, having done so in 2019.

Other international conventions related to maritime governance do not extend protections to fishers. The Maritime Labour Convention (2006) explicitly excludes fishing vessels from its scope, stating that the convention applies to all vessels "other than ships engaged in fishing or in similar pursuits." This exclusion leaves fishing crews without the Maritime Labour Convention's robust flag state enforcement mechanisms. Likewise, the Food and Agriculture Organization of the United Nations Port State Measures Agreement (PSMA), which entered into force in 2016, focuses primarily on combating illegal, unreported, and unregulated (IUU) fishing. Although its Annex E guidelines for inspector training reference health, safety, and security issues, this agreement does not explicitly cover inspection authority for labor conditions.

Regional Fisheries Management Organizations (RFMOs) add another layer to this governance landscape. Established under international agreements, RFMOs have binding authority over conservation and fisheries management measures, such as catch limits, gear restrictions, and vessel monitoring, within their respective areas of competence. However, their mandates are narrowly focused on resource sustainability and compliance with fishing rules. In general, RFMOs do not regulate labor conditions or crew welfare, nor do they have enforcement mechanisms for human rights violations.[5] This creates a significant governance gap: while RFMOs exert strong control over fish stocks and vessel behavior, they remain silent on labor standards, leaving enforcement entirely to flag, port, and sending states. The absence of labor provisions in RFMO frameworks perpetuates a regulatory blind spot in which sustainability and labor rights are treated as separate spheres, despite their interdependence in global fisheries governance.

3.1.3 Domestic Legal Protections in Major Flag and Sending States

The following sections describe the domestic legal protections in the major flag states and sending state relevant to the study sample: China, Taiwan, and Indonesia.

3.1.3.1 China

China's domestic labor framework provides comprehensive statutory protections but faces fundamental jurisdictional limitations when applied to vessels operating in international waters or foreign EEZs. In addition, China has developed sector-specific regulations for DWF through the Ministry of Agriculture and Rural Affairs, including the Regulations on the Management of Distant-Water Fisheries (2020), the Notice on Further Strengthening the Safety Management of Distant-Water Fisheries (2020), and the

[5] There is one exception to this. In 2024, the Western and Central Pacific Fisheries Commission became the first RFMO to adopt binding crew labor standards when it adopted Conservation and Management Measure 2024-04 in December 2024 (World Wildlife Fund, 2025). Implementation of these binding labor standards have, however, been delayed until 2028.

Notice on Further Strengthening the Management and Services for Foreign Crew Members in Distant-Water Fisheries (2025). However, enforcement of both general labor protections and fisheries-specific regulations remains limited in practice.

China's legal framework includes the following protections:

- Labor Contract Law Article 9 prohibits security deposits and document retention. Article 84 imposes fines of USD $71 to $286 per worker for violations. Employment Promotion Law Article 41 extends these prohibitions to employment agencies.
- Criminal Law Article 244 criminalizes forced labor through movement restriction, with aggravated circumstances increasing penalties to 3 to 10 years of imprisonment.
- Labor Contract Law Articles 30 and 85 require timely full payment of wages and impose penalties of 50% to 100% additional compensation for violations.

Despite these protections and the existence of fisheries-specific regulations, advocacy groups and civil society organizations routinely document systemic violations on Chinese distant water vessels. The enforcement gap stems from two factors: first, jurisdictional limitations, as Chinese labor laws apply "within the territory of the People's Republic of China" (Labour Law of the People's Republic of China, 1994), leaving foreign crew on vessels in international waters or foreign EEZs without effective access to Chinese labor dispute mechanisms; and second, China's systematic choice not to dedicate enforcement resources to labor standards compliance on Chinese-flagged vessels operating in distant waters. China maintains regulatory authority over its flagged vessels through both general labor law and fisheries-specific regulations, but it has opted not to extend robust labor enforcement mechanisms to ensure compliance on Chinese-flagged DWF vessels, creating a de facto enforcement vacuum despite comprehensive statutory frameworks.

3.1.3.2 Taiwan

Taiwan's regulatory framework distinguishes between "domestically hired" and "overseas-hired" foreign crew, a distinction that critics argue facilitates forced labor. Overseas-hired crew, comprising the majority of Taiwan's approximately 19,000 foreign fishing workers, are explicitly excluded from the Labor Standards Act (Tseng et al., 2023). The Ministry of Labor justifies this exclusion by stating that overseas-employed crew are "employed overseas, laid off overseas, and returned directly to their home country after the fishing operation is finished" (Fisheries Agency, Council of Agriculture, 2021). This dual-track system creates fundamentally unequal protection regimes based on hiring location rather than substantive working conditions.

Taiwan's legal framework includes the following protections:

- Human Trafficking Prevention Act Article 2(1) defines human trafficking as including violence, threats, confinement, document withholding, and "improper debt bondage," defined in Article 2(3) as "the use of unclear contracts or unreasonable payments of a debt to place people under bondage." Article 31 criminalizes these practices with penalties of 1 to 7 years of imprisonment and fines up to USD $158,876.
- Passport Act Article 32 criminalizes document retention with imprisonment up to 3 years and fines up to USD $9,533.

However, Taiwan's Employment Service Act Article 35 authorizes employment agencies to collect recruitment fees, with regulations permitting unlimited recruitment and service fees. This creates a structural contradiction: although Taiwan criminalizes debt bondage, it simultaneously permits the recruitment fee practices that routinely create the debt burdens that lead to bondage conditions documented by advocacy organizations and in U.S. Department of Labor findings.

3.1.3.3 Indonesia

Indonesia has incorporated most international forced labor prohibitions into domestic law, but the fishing sector operates under a distinct regulatory regime that provides weaker protections than general labor law, particularly through the *bagi hasil* (profit sharing) wage system that effectively exempts fishing from minimum wage requirements.

- Law No. 21 of 2007 on Trafficking provides the primary framework. Article 1(15) defines debt bondage as "the act of placing a person in a situation or condition where such person places or is forced to place him/herself or his/her family […] as a form of repayment of the debt." Article 2 establishes penalties of 3 to 15 years of imprisonment and fines of USD $7,163 to $35,815 for trafficking offenses.
- Law No. 18 of 2017 on Protection of Indonesian Migrant Workers Article 30(1) states that Indonesian migrant workers shall not be charged placement costs, a prohibition implemented through Regulation No. 9 of 2020, issued by the Agency for the Protection of Indonesian Migrant Workers, which defines "recruitment fee" broadly to include expenses for recruitment, placement requirements, and necessary support costs in destination countries, prohibiting charges for flight tickets, work visas, contract legalization, training, medical check-ups, transportation, accommodation, and service fees.
- Regulation No. 33 of 2021, issued by the Ministry of Marine Affairs and Fisheries, Article 176, permits crew remuneration through *bagi hasil* (profit sharing) systems, which effectively exempts fishing from minimum wage requirements. This system also facilitates exploitation through opaque calculations and deductions.

3.1.4 Overlapping Jurisdictional Frameworks

The governance of labor conditions on DWF vessels involves multiple, often concurrent jurisdictional grounds under international law.[6]

Each of the jurisdictional grounds described in the following sections represents a separate legal basis upon which a state could legitimately exercise jurisdiction over labor conditions on DWF vessels. Under the principle of flag state jurisdiction, for example, states can assert the authority to apply their laws over a vessel flying their flag. At the same time, if a given ship is in a foreign port, another state may have grounds to inspect and enforce its own legal standards on that ship based on the principle of port state jurisdiction.

Although these overlapping authorities create theoretical opportunities for robust enforcement, with multiple states possessing legitimate grounds to investigate and remedy labor violations, in practice, this multiplicity produces a diffusion of responsibility in which each jurisdiction points to others rather than exercising its own authority.

3.1.4.1 Flag State Jurisdiction

Flag state jurisdiction remains the primary regulatory authority under international maritime law (National Oceanic and Atmospheric Administration, 2025). Flag states have the duty under UNCLOS Article 94 to exercise jurisdiction over vessels flying their flag and to ensure compliance with labor standards (United Nations, 1982), but flag states rarely conduct at-sea inspections of their distant water fleets, citing cost, distance, or practical difficulties. In addition, the prevalence of flags of convenience undermines this framework's effectiveness.

[6] "Concurrent jurisdiction" in this context means that more than one state may have legitimate legal authority to regulate the same conduct or investigate the same labor violation—for instance, both the flag state of a vessel and the port state where it docks may have authority to investigate abusive labor conditions aboard that vessel.

Flags of convenience and the erosion of the "genuine link" requirement: International law requires a "genuine link" between a vessel and its flag state under UNCLOS Article 91. However, maritime vessels often bear little to no relationship to their flag state through the actual nationality of crew, captain, company, or beneficial owner (Ford & Wilcox, 2019). Vessels may adopt flags of convenience for various reasons, including tax advantages, reduced regulatory burden, crew recruitment flexibility, and—critically for enforcement—access to more corrupt or regulatory lax maritime management legal systems (Ford & Wilcox, 2019; Park et al., 2023). Nearly 30 countries are recognized as providing flags of convenience, fundamentally undermining the flag state jurisdiction framework (Park et al., 2023; Selig et al., 2022).

Flag hopping and false registration are recognized strategies used by DWF vessels to evade monitoring and enforcement. Beyond individual vessels, entire "shadow fleets" have emerged, particularly in high seas fisheries. These fleets frequently reflag within days or weeks, cycling through multiple jurisdictions and names to avoid sanctions and inspections. Studies by GFW and other organizations show that such fleets are common among tuna and squid fisheries, creating significant enforcement blind spots and undermining traceability (Chambers, 2025; Global Fishing Watch, 2023; Triebert et al., 2023).

3.1.4.2 Port State Jurisdiction

Port state jurisdiction allows countries to inspect foreign vessels entering their ports and enforce their own labor laws or international conventions to which they are party, regardless of the vessel's flag. This authority extends to investigating conditions that occurred prior to port arrival, and not merely conditions observable at the time of inspection (National Oceanic and Atmospheric Administration, 2025). However, this authority depends on port state capacity and willingness to act. In practice, most port state inspections focus on fisheries compliance, such as catch documentation, species identification, and gear restrictions, rather than labor conditions (Global Fishing Watch, 2021). The PSMA provides a framework for port inspections but does not mandate labor condition checks, and port authorities rarely exercise their existing authority to investigate such conditions (Selig et al., 2022).

3.1.4.3 Coastal State Jurisdiction

Coastal state jurisdiction allows states to exert jurisdiction over vessels operating in their EEZs under fishing access agreements (National Oceanic and Atmospheric Administration, 2025). This jurisdiction could theoretically extend to labor conditions as part of vessel licensing requirements, but enforcement under this jurisdictional heading has generally been limited to environmental and fisheries regulations.

3.1.4.4 Sending State Jurisdiction

Sending state (or "passive personality") jurisdiction theoretically governs recruitment practices and the conduct of nationals working as manning agents (Gallant, 2022; Society of International Law & Policy, 2020). Sending states can also potentially exercise jurisdiction over crimes committed against their nationals abroad under the passive personality principle. However, enforcement becomes difficult once workers leave the country, and coordination with flag or port states is rare. Sending states typically under-resource complaint mechanisms for fishing sector recruitment violations, leaving workers without practical remedies even when domestic law clearly prohibits the practices they experience. Indonesia's zero-fee policy remains largely unenforced, with workers routinely charged recruitment fees that create debt bondage (Walk Free, 2025). Complaint channels are inaccessible to workers at sea, and tied visa arrangements facilitate deportation before remedy (Global Labor Justice, 2025).

3.1.4.5 *Market State Jurisdiction*

Market states can deploy a variety of authorities to develop and operationalize a coordinated response to prosecute or otherwise hold accountable those involved with, or benefitting from, forced labor on fishing vessels. Market states can use their jurisdictional authorities to deter labor trafficking and to provide support and protection to forced labor survivors. They can also issue financial sanctions against

certain individuals benefitting from forced labor, hold corporations criminally liable for the crime of forced labor within the supply chain, or detain imports of prohibited items like products made with forced labor. Increasingly, forced labor import bans are emerging in the EU and elsewhere, but enforcement remains nascent in most countries. Beyond direct reporting and enforcement, market states can also incentivize foreign governments to strengthen accountability and enforcement through trade agreements and preference programs, diplomatic support, and technical assistance.

3.1.5 The Enforcement Void

Systematic labor exploitation persists across the DWF sector, despite clear jurisdictional authority under international law that could enable multiple states to investigate and enforce labor standards. Although certain statutory gaps remain—such as Taiwan's exclusion of overseas-hired crew from Labor Standards Act protections and China's opting not to extend its labor regulations to Chinese-flagged vessels—these alone do not account for the widespread abuse documented on DWF vessels. The primary driver is not a lack of legal authority but an absence of governance capacity and political will. This collective failure to exercise legitimate jurisdiction allows exploitation to thrive across regulatory boundaries, leaving workers trapped in a system in which many hold authority but few take action.

3.2 CHARACTERISTICS OF VESSELS AND CATCH

The preceding sections have established the operational environment and legal frameworks that theoretically govern DWF labor. The remainder of this section presents empirical findings from worker interviews conducted in Indonesia and Taiwan, documenting the experiences and working conditions of Indonesian migrant fishers in the DWF industry.

3.2.1 Flag States and Captain Country of Origin

Table 1[7] provides information about the flag states of vessels on which respondents in the survey sample worked. Half (51%) worked on Taiwan-flagged vessels, and 17% worked on China-flagged vessels. Civil society assessments identify China as the highest-risk flag, with systematic IUU fishing and human rights abuses documented on distant water squid and tuna fleets, particularly in the Southwest Indian Ocean (Environmental Justice Foundation, 2021, 2024a; Urbana, 2024). External investigations document denial of medical care, continuation of work after severe injury, and mortality risks on these fleets. Taiwan's vessels present a mixed picture, according to qualitative and secondary data. Key informants noted that smaller tuna longliners often subject Indonesian fishers to irregular or delayed wages, extended working hours with limited rest, inadequate medical access, and restrictions on shore leave at privately managed foreign

Longliner at port in Taiwan. Source: ICF

[7] Notes for all tables: missing responses ("don't know" and "refused") are excluded from the denominator for all estimates. Each row presents both an estimate and the numerator, denoted by "n," associated with the estimate. The denominator, denoted by "N," is included at the bottom of tables in which all rows have the same denominator, and it is presented in the final column of the row in tables in which rows have varying denominators (due to question filters or subgroup analysis).

ports. In contrast, Taiwanese squid vessels operating under Falkland Islands oversight reportedly follow stricter scientific fisheries management as well as crew welfare practices (Human Rights at Sea, 2023).

Smaller proportions of respondents worked on Spanish (9%) and Japanese (4%) vessels. Qualitative data from KIIs as well as previous reporting (Blue Marine Foundation, 2025; Oceanographic, 2025) suggest that European fleets show wage gaps for African crews and restricted shore leave, though some segments display incremental improvements in grievance access and onboard connectivity requirements. Japan's apprenticeship model raises concerns when "training" substitutes for fair wages. The remaining 19% of respondents worked on vessels flagged by a diverse set of countries: Chile, England, France, Ireland, Kenya, Malaysia, Micronesia, New Zealand, Portugal, Russia, South Korea, the United States, and Vanuatu.

South Korea's larger longliners demonstrate clearer wage structures and employer-paid recruitment fees in policy, alongside measures such as mandatory port calls, passport safekeeping rules, bans on illegal fee deductions, and reporting portals. However, civil society reports continue to document excessive working hours, salary deductions, and identity document confiscation, recommending ratification of ILO C188 (Business and Human Rights Centre, 2023; Financial Times, 2025; Ministry of Oceans and Fisheries, 2024). While larger vessels offer comparatively better facilities, captain-managed logs and lack of cumulative tracking obscure chronic overtime and rest hour violations (Business and Human Rights Centre, 2023; Vyawahare, 2023).

Table 1. Flag state of respondents' vessels

	%	n
Taiwan	51%	63
China	17%	21
Spain	9%	11
Japan	4%	5
Other[1]	19%	24
Number of respondents (N)		**124**

[1] Includes flag states reported by fewer than five respondents (Chile, England, France, Ireland, Kenya, Malaysia, Micronesia, New Zealand, Portugal, Russia, South Korea, the United States, Vanuatu).

In most fleets, the captain is responsible for enforcing flag state and RFMO rules on board. However, captains usually report to the owning or managing company, and act as the company's representative in dealings with agents, carriers, and port authorities. Company directives, often coming from the UBO, shape decisions that affect transparency and labor conditions, such as which ports to use, which agents to hire, whether crew can communicate or leave the vessel, and whether fishers are given access to grievance channels. Captains' nationality can also signal which commercial networks and governance norms influence operations, and their control over pay, promotion, and repatriation gives companies leverage that undermines oversight, even when legal jurisdiction seems clear. Nearly half of respondents (46%) reported captains from Taiwan, followed by 21% from China, 9% from Spain, 5% from Japan, 4% from South Korea, 3% from Chile, and 10% from other countries; 2% did not know the captain's country of origin (Table 2). In most cases, the captain's country of origin matched the flag state of the vessel, but this was not universal. See Section 3.5.2.1 for a discussion of flag and captain mismatches and the implications.

Table 2. Captain's country of origin by flag state of vessel

	Flag state of vessel			Total	
	Taiwan	China	Other		
	%	%	%	%	n
Taiwan	89%	0%	3%	46%	57
China	5%	90%	10%	21%	26
Spain	0%	0%	28%	9%	11

	Flag state of vessel			Total	
	Taiwan	China	Other		
	%	%	%	%	n
Japan	0%	0%	15%	5%	6
South Korea	0%	0%	13%	4%	5
Chile	0%	0%	10%	3%	4
Other	5%	5%	23%	10%	13
Don't know	2%	5%	0%	2%	2
Number of respondents (N)	**63**	**21**	**40**		**124**

3.2.2 Catch Species

Deck processing small pelagics such as sardines or anchovies. Source: iStock by Getty Images

Table 3 summarizes the species targeted by respondents' vessels. Nearly half (48%) reported working on vessels harvesting tuna and tuna-like species, primarily yellowfin tuna (40%) and bluefin tuna (24%). Large pelagics such as swordfish and mahi-mahi accounted for 31%, and squid was reported by 24% of respondents. Pacific chub mackerel (*Scomber japonicus*) represented 20% and is often caught seasonally by vessels switching gear from squid operations to purse seining. Groundfish, including benthic species (e.g., cod, pollock) and demersal fish (e.g., snapper, grouper), were targeted by 12% of vessels, small pelagics such as sardines and herring were targeted by 9% of vessels, and 19% of vessels reported other species, including shark, stingray, and crab, underscoring the diversity of catch profiles across fleets. Multiple responses were possible, as many vessels operate multi-specific or seasonal gear strategies.

Vessels flagged to Taiwan, China, and other countries targeted tuna, large pelagics, groundfish, and small pelagics at similar rates. A higher percentage of Chinese vessels (57%) targeted squid, compared to Taiwanese vessels (14%) and other vessels (23%). A higher percentage of Taiwanese vessels (38%) targeted Pacific chub mackerel, compared to Chinese vessels (5%) and other vessels (0%).

Fresh catch at port in Taiwan. Source: ICF

Table 3. Species of catch by flag state of vessel

	Flag state of vessel			Total	
	Taiwan	China	Other		
	%	%	%	%	n
Tuna and tuna-like species[1]	48%	48%	50%	48%	60
Large pelagics[2]	32%	24%	35%	31%	39
Squid	14%	57%	23%	24%	30
Pacific chub mackerel	38%	5%	0%	20%	25
Groundfish	48%	48%	50%	12%	15
Small pelagics	6%	10%	13%	9%	11
Other	21%	10%	20%	19%	23
Number of respondents (N)	**63**	**21**	**40**		**124**

[1] Including bluefin, yellowfin, albacore, bigeye, skipjack, and other tuna-like species.
[2] Including mahi-mahi, swordfish, and marlin/sailfish.

3.2.3 Type of Gear and Transshipment

The main species targeted by respondents' vessels correspond to three dominant gear types (longliners and purse seiners, squid jiggers, and trawlers), which allow vessels to stay at sea for longer periods of time between port visits (Table 4).

Longliners and purse seiners target tuna and other large pelagics. Industrial longliners use miles of baited hooks, and purse seiners encircle schools of fish with nets. These vessels typically operate across RFMO-managed waters and in adjacent EEZ high seas. Longline operations are labor-intensive and often involve overnight setting and hauling cycles, with fishing effort and crew fatigue compounding during peak seasons and multi-week trips. Globally, tuna longline fleets number in the thousands (Industrial Economics & Gomez-Hall Associates, 2023). Purse seine operations are more capital-intensive, designed around high-volume capture and freezing at sea; many large purse seiners incorporate advanced fish-finding capacity, including spotter helicopters in some fleets, and can rapidly collect large volumes of catch. Nearly half (44%) of respondents worked on longline vessels, and 4% worked on seiners.

Squid jiggers use bright lights at night to attract squid to the surface, then pull them out of the water using automated machines (jiggers) that repeatedly lift and drop lines with hooks to quickly catch large volumes of squid. Recent studies show these "light-luring" operations are concentrated in predictable offshore areas, including high seas in the Eastern Pacific, North Pacific, and Southwest Atlantic (Seto et al., 2023). Most squid from these fleets are frozen on the vessel or quickly stabilized after catch, with further processing usually done in specialized coastal facilities. Close to one-third (31%) of respondents worked on squid jiggers. In Taiwanese fisheries, some squid jigging vessels switch seasonally to Pacific chub mackerel, using seine-type nets to encircle dense shoals. Because mackerel is highly perishable, rapid freezing at sea is essential.

Purse seiner at sea. Source: iStock by Getty Images

Trawlers drag heavy nets across the seafloor or midwater. Industrial trawl fleets (including freezer trawlers) can remain at sea for extended periods, process and freeze on board, and deliver high-volume frozen blocks and fillets into global commodity channels. They target species in mid-water such as mackerel, herring, sardines, squid, and others, as well as groundfish such as pollock, leaving severe environmental damage behind. Vessels can freeze and store thousands of metric tons, enabling long and distant operations that rely on periodic port visits or mid-sea support to maintain continuous delivery to processing facilities and global markets. In the study sample, 13% of respondents worked on trawlers.

The remaining respondents worked on trap setters (vessels that deploy baited traps or pots on the seafloor) (3%), gillnetters (vessels that use walls of netting that hang vertically in the water) (2%), transfer vessels (1%), and processing vessels (1%).

Table 4. Type of vessel by flag state

	Flag state of vessel			Total	
	Taiwan	China	Other		
	%	%	%	%	n
Longline vessel	46%	33%	48%	44%	55
Squid jigger	44%	38%	8%	31%	39
Trawler	0%	19%	30%	13%	16
Seiner	3%	5%	5%	4%	5
Trap setter	6%	0%	0%	3%	4
Gillnetter	0%	5%	5%	2%	3
Transfer vessel	0%	0%	3%	1%	1
Processing vessel	0%	0%	3%	1%	1
Number of respondents (N)	**63**	**21**	**40**		**124**

Offloading of catch to another vessel while at sea (transshipment) was reported by a substantial share of respondents, with marked differences by vessel flag state. Overall, 44% of workers indicated that offloading occurred. Offloading was most commonly reported among fishers working on China-flagged

vessels, for which the majority (81%) indicated that catch was transferred to another vessel at sea. In contrast, 41% of workers on Taiwan-flagged vessels reported offloading, and the practice was least common among vessels flagged to other countries, reported by 28% of respondents.

3.3 CHARACTERISTICS OF RESPONDENTS

Table 5 summarizes background characteristics of the respondents in the sample. Respondents ranged in age from 19 to 54, with an average age of 33 (32 on Taiwan-flagged vessels, 28 on China-flagged vessels, and 37 on vessels with other flags). Consistent with the DWF sector more broadly (Dewanto et al., 2023; International Labour Organization, 2024; Kelly et al., 2025), all respondents were male. Two-thirds (67%) of respondents were born in Java (67%), 15% in Sumatra, 9% in Sulawesi, 5% in Nusa Tenggara, and 3% in Maluku Islands. Regarding education levels, 44% of respondents completed senior high or higher, 32% completed junior high, 20% completed primary school, and 4% either completed some primary school or never attended. Respondents' years of experience working on foreign fishing vessels varied widely: one-third (35%) worked on only 1 vessel, 15% on 2, 17% on 3, and 33% on 4 or more. There were notable differences by vessel flag: on average, workers on Chinese vessels had less experience (1.8 vessels on average), compared to workers on Taiwanese vessels (3.2 vessels on average) and other vessels (3.9 vessels on average).

Table 5. Respondent background characteristics

	Flag state of vessel			Total	
	Taiwan	China	Other		
	%	%	%	%	n
Age (years)					
18–24	17%	19%	5%	14%	17
25–34	51%	76%	28%	48%	59
35–44	19%	5%	48%	26%	32
45+	13%	0%	20%	13%	16
Sex					
Male	100%	100%	100%	100%	124
Female	0%	0%	0%	0%	0
Region of birth					
Java	59%	65%	83%	67%	83
Sumatra	21%	20%	5%	15%	19
Sulawesi	10%	10%	8%	9%	11
Nusa Tenggara	8%	0%	3%	5%	6
Maluku Islands	3%	5%	3%	3%	4
Education					
No formal schooling	0%	0%	3%	1%	1
Some primary	5%	0%	3%	3%	4
Completed primary	21%	24%	18%	20%	25
Completed junior high	30%	24%	40%	32%	40
Completed senior high or higher	44%	52%	38%	44%	54
Number of foreign fishing vessels worked on					
1	33%	57%	25%	35%	43
2	16%	24%	10%	15%	19
3	21%	10%	15%	17%	21
4 or more	30%	10%	50%	33%	41
Number of respondents (N)					**124**

3.4 NATURE OF WORKING AND LIVING CONDITIONS

The following sections discuss the working and living conditions experienced by respondents.

3.4.1 Recruitment

Recruitment practices create systemic risks for migrant fishers. Indonesian workers are hired through parallel systems, including manning agencies in Indonesia and agencies in destination countries such as Taiwan, China, South Korea, and Japan (Kelly et al., 2025). This multi-layered structure, often involving sub-agents and village-level brokers, dilutes accountability and obscures responsibility for recruitment fees, contract terms, and wage payments. Such fragmentation enables illegal practices, including charging excessive fees, confiscating identity documents, and withholding wages, which are all prohibited under Indonesian and international law but rarely enforced.

Most respondents (94%) obtained their jobs through a manning agency or broker and were typically referred by friends or family (78%). All respondents had a written contract for their work. Nearly all had time to read the contract before signing it (98%) and could understand the language in which the contract was written (98%). Sixteen fishers (13%)[8] reported that the actual conditions of their job did not match the promises made by their employers or recruiters. Among these workers, the most common conditions not matching promises were the amount of earnings (reported by six fishers), working hours (six fishers), nature of the job (five fishers), and work tasks (four fishers) (multiple responses were possible).

One fisher described being placed on a different type of vessel than promised, with a different flag country, and without Wi-Fi:

> *"They said I would be placed on longline, right, but it was the opposite of that and then when I got there the vessel was different. […] The vessel was a Chinese vessel [with] no signal either. I had already told the PT [Limited Liability Company, here: in reference to the manning agent in Indonesia], they said that's just how it is. […] Once on the vessel we just accept it."*
>
> —*Fisher*

Another explained that he was deceived about his pay:

> *"I really feel disadvantaged, because I was at sea working, risking my life, but the salary didn't match, it wasn't on time, and then it wasn't paid."*
>
> —*Fisher*

Another fisher described working much longer hours than expected based on his contract:

> *"In the PKL [contract] it is written 10 hours, but in reality it is not 10 hours."*
> *[Interviewer: So if you don't follow it you are sent home?]*
> *"Yes, you can be sent home because we are considered to be disobeying, disobeying the captain's orders."*
>
> —*Fisher*

3.4.1.1 Recruitment Costs

More than two-thirds of workers (69% total; 62% on Taiwanese vessels, 86% on Chinese vessels, 70% on other vessels) incurred recruitment costs, and nearly half (49%) reported going into debt with their direct employer or manning agent to cover these expenses.[9] Debt was most common among workers

[8] Data are based on transcript analysis. Because not all respondents provided this information, the estimate may understate the true extent of the finding. Includes 7 of 63 workers on Taiwanese vessels (11%), 6 of 21 workers on Chinese vessels (29%), and 3 of 40 workers on other vessels (8%).

[9] Data are based on transcript analysis. Because not all respondents provided this information, the estimate may understate the true extent of the finding.

on Chinese vessels (76%), followed by those on Taiwanese vessels (59%), and it was substantially lower among workers on other vessels (20%).

Many workers who did not borrow from their employer or manning agent to cover recruitment costs borrowed from family members or financial institutions, in some cases pledging their homes as collateral. One worker explained how recruitment agencies facilitate bank loans:

> *"If a crew member does not have money, from the system, if they don't have 30 million [USD $1,782], the rest is borrowed using a house certificate through the bank. The PT handles the process."*
>
> *—Fisher*

Workers who incurred recruitment-related debt to their employer or manning agent reported an average recruitment cost of USD $672.[10] One-fifth (20%) of those who shared their recruitment costs with researchers reported costs of USD $1,000 or higher. Among those workers who shared their recruitment costs and incurred recruitment-related debt to their employer or manning agent, 59% incurred costs exceeding one month's pay. These expenses are highly significant and may pressure workers to remain in jobs with poor conditions, as the debt would be insurmountable without continued employment in fishing.

Some respondents were unclear about the exact amounts paid or what the charges covered, while others provided detailed breakdowns. One fisher explained:

> *"The total is around IDR [Indonesian Rupiah] 5,500,000 [USD $330], that is for the passport, for the medical check-up, and BST, Basic Safety Training. After that we have a cash cost for us to come here, to be sent here. For that, we were charged. For me, that was IDR 8,290,000 [USD $500]. [All together,] IDR 5,500,000 and 8,290,000—"*
> *[Interviewer: So in total that's roughly 14 million [USD $841], right?]*
> *"Yes. [I borrowed] from my manning agency, we can apply for a loan first from the agency. […] Later we pay it back in installments. […] If we pay it back on board, that is from the salary here. In our agency's system, there is a wage system. The payments are split: one part is bank transfer, one part is onboard cash. For me, the repayment was deducted directly from the transferred salary."*
>
> *—Fisher*

Another respondent recounted a conversation with the vessel owner that highlighted a disconnect among actors in the recruitment process, leading to exploitation of workers. After describing the recruitment costs he paid to the Indonesian manning agent, he stated:

> *"Actually, we are not supposed to pay. [My boss] said to me, […] "Your Indonesian agency is not good. […] From the ticket, all documents processing, visa processing, all are backed up by me. If you still have to pay, it means your agency is not good."*
>
> *—Fisher*

3.4.1.2 Security Deposits

Seventeen respondents (14%)[11] indicated that they were required to provide their employer or manning agent with a security deposit that would be returned after the completion of the contract. This percentage was much higher for those on Chinese vessels (43%) than those on Taiwanese (10%) or other (5%) vessels. Some provided the deposit in cash, and for others it was deducted from their pay:

[10] Estimate excludes outliers. The average recruitment cost was USD $679 for workers on Taiwanese-flagged vessels, USD $693 for those on Chinese-flagged vessels, and USD $596 for those on other vessels.
[11] Data are based on transcript analysis. Because not all respondents provided this information, the estimate may understate the true extent of the finding.

"The monthly salary becomes the guarantee, that's usually [USD] $800; […] after returning, it will be returned."

—Fisher

Workers who did not complete their contract risked losing the security deposit. One explained:

"It's like a guarantee in case we "break" the contract— if we don't finish the contract, there is a deduction of a thousand [dollars] so it's forfeited."

—Fisher

Some fishers said that security deposits were often required in the past but are less common now. One said that Taiwanese law no longer allows security deposits, yet Indonesian recruitment agents continue to impose them:

"In the period before strict regulations by Taiwan government, in the contract it clearly stated deposit. Deposit was written so that crew doesn't run away in Taiwan to become illegal workers. The deposit will be returned when crew finishes contract. But there is a new regulation from Taiwan government stating crew cannot be charged deposit. So deposit was removed from contract. But they create another agreement outside the contract determined by Taiwan government. So people say that's 'just changing clothes' [looks different, but same underneath]. Taiwan government sees the contract, sees no deposit, but outside of that there is a signature."

—Fisher

3.4.2 Earnings

Payment systems in the DWF industry often create significant challenges for workers. Delayed wages are common and can lead to serious financial strain. Key informants described a chain of arrears across multiple actors: vessel owners postpone payments to manning agents in destination countries, who then delay transfers to Indonesian manning agents. This cascading system can result in months without wages for workers. Exchange rate fluctuations during batch disbursements and nontransparent deductions exacerbate financial losses. External reports confirm wage withholding and illegal deductions on Taiwanese fleets, as well as persistent salary inequalities despite policy commitments (Cheung, 2025; Greenpeace, 2024).

3.4.2.1 Reported Earnings and Delays

The earnings reported by fishers varied widely (Table 6). They reported median monthly earnings of USD $550 and mean monthly earnings of USD $630. Around half (52%) earned USD $500 to $600 per month,[12] 19% reported earning less than USD $500 per month, and 29% earned more than USD $600 per month. Workers on Chinese vessels reported lower monthly earnings on average (USD $406), compared to those on Taiwanese vessels, who reported average monthly earnings of USD $592, and those on other vessels, who reported average monthly earnings of USD $836; the average earnings of workers on vessels not flagged to China or Taiwan were more than double those of workers on vessels flagged to China. Nearly one-fifth (19%) of respondents reported difficulty accessing their earnings, with a much higher percentage of workers on Chinese vessels (43%) reporting difficulty, compared to those on Taiwanese (11%) or other (18%) vessels. Informal conversations with fishers on shore leave and KIIs with support organizations confirm that problems with receiving pay are pervasive and deeply concerning from the fishers' perspective.

Payment delays were common; 11% of respondents experienced payment delays exceeding one month or delays related to low catch or vessel breakdowns. One explained that his wages were delayed for a month "because at that time the vessel was broken. Our system was profit-sharing. When it broke

[12] These estimates exclude values that seem likely to have been reporting or data entry errors, including 4 workers who reported earning less than USD $2 and 2 workers who reported earning more than USD $2,000.

down, maybe for the repair they used that money first." Another said that his pay is delayed "often; when the vessel's catch is low [off-season], salary is late."

Multiple respondents reported being owed more than a year of overdue wages. When asked why he has not been paid, one explained:

> *"Because the company went bankrupt. Then they said it would be paid after the vessel was sold, but until now it still hasn't been paid. It's been almost a year since I came home."*
>
> —*Fisher*

Key informants reported that households often incur debt during workers' voyages, and workers hesitate to complain when overdue wages are at stake. This payment structure leaves workers with limited options and makes it difficult to leave exploitative situations. Many workers reported delayed wages that likely reduced their ability to refuse poor conditions or exit employment, and 5% explicitly stated that withheld earnings were used as leverage to compel work. One fisher explained that bonuses based on catch amount used to be paid every three months, but the policy changed:

> *"But the company said the bonus would not be paid then. So all bonuses are paid out only later. Because many people ran away, Sis. Many ran away, so maybe the company suffered losses. They already gave them money, and then they all ran away and did not come back to the vessel."*
>
> —*Fisher*

Table 6. Form of payment and amount of earnings by flag state of vessel[1]

	Flag state of vessel			Total	
	Taiwan Est.	China Est.	Other Est.	Est.	n
Median monthly earnings[1]	$550	$400	$825	$550	112
Mean monthly earnings[1]	$592	$406	$836	$630	112
Monthly earnings[1]					
Less than $500	5%	84%	6%	19%	21
$500 to $600	79%	11%	25%	52%	58
More than $600	16%	5%	69%	29%	33
Difficulty getting earnings	11%	43%	18%	19%	23
Earnings delayed by more than one month[2]	5%	29%	13%	11%	14
Earnings delayed/reduced because of low catch or vessel problems[2]	2%	0%	8%	3%	4
Paid by[3]					
Manning agency	68%	81%	38%	60%	75
Fishing company	33%	29%	53%	39%	48
Vessel captain	10%	10%	15%	11%	14
Number of respondents (N)	**63**	**21**	**40**		**124**

[1] Excludes outliers.
[2] Data are based on transcript analysis. Because not all respondents provided this information, the estimate may understate the true extent of the finding.
[3] Multiple responses possible.

3.4.2.2 Payment Channels and Responsibility

More than half (60%) of workers were paid by their manning agent, 39% by the fishing company, and 11% by the vessel captain. Some workers received part of their payment from one source and part from another (Table 6).

Sometimes the transfer of funds between these entities causes significant delays. One fisher explained:

> *"For me, I receive [my pay] every three months. […] Because of the process from the vessel owner boss to the agent, from the agent to the boss, office boss. So it takes time."*
>
> —*Fisher*

Another fisher described how these inter-entity transfers led to prolonged delays and unpaid wages and obscured responsibility:

> *"[After I had worked 10 months without pay,] my wife came here, begged—given 500 thousand rupiah [USD $30], then 1 million [USD $60]. After I called and got angry, only then did they give 3 months in full—15 million [USD $900].*
> *[When asked whether he is still owed unpaid wages, the respondent replied:]*
> *"Yes. Salary. But I consider it done. In the [contract] it says salary is paid on board. But in reality, they remitted everything here [in Indonesia]. So here [the Indonesian agents] don't want to take responsibility. The excuse is it hasn't been sent. From over there they send [USD] $350, $400—send it all. Maybe if I had transfer proof I could push it. But I don't have transfer proof from the foreign agency. [I'm still owed] 7 million [USD $420]. But chasing it would be troublesome and exhausting. Rather than chasing it, I'd rather depart [to sea] again."*
>
> *—Fisher*

An advocate from a fisher support organization highlighted how payment disputes often stem from overlapping debts and unclear responsibilities among different actors. He explained:

> *"We met some fishers who hadn't been paid in eight to nine months. Their employers said we already paid the manning agent. The manning agent said you're just paying the debt you owed us. Manning agent keeps the money because the employer had borrowed money from the manning agent. Ship owners have debt all over. That was just one example but we see this."*
>
> *—Civil society representative*

This effectively means a rolling system of payment of previous debt between recruitment agents and employers, in which current wages are withheld to pay wages from previous months.

When asked about delayed wages, one worker said:

> *"Yes, it happened to me. For those 15 months, only 10,500,000 [USD $631] was transferred, even though it should have been more than that, more. […] Until now that salary hasn't come down, […] We also want to depart again. So if we waited for the salary, it would take a long time, Sir. So we depart first and wait while working."*
> *[Interviewer: Up to now, do you still have unpaid income?]*
> *"Yes, 32 million [USD $1,923] left, Sir."*
>
> *—Fisher*

When asked about the reason, he explained:

> *"The reason generally, like when I went home, the Agency Guarantee Cost hadn't been paid. So it was withheld first. In my view that's just the office's game, Sir. As far as I know, from Agency Guarantee Cost it should be paid directly, once every three months. They say it's from the agency, etc. But from the agency side it should have already been paid."*
>
> *—Fisher*

Very few workers reported going into debt with their employers after the recruitment phase. Two went into debt because of excessive on-board charges for goods like food, and some workers mentioned debt due to pay advances.

Few workers (6%) reported that their earnings depend on meeting a quota or target; however, the qualitative data indicated that it is common for workers to receive a bonus based on the quantity of fish caught.

3.4.3 Primary Work Activities

Most fishers performed many different work tasks while on board. When asked about their primary work activity, 50% indicated fishing (Table 7). Less common primary activities included butchering (15%), freezing and storage (11%), cleaning (6%), and cooking (2%). Other primary work activities mentioned by respondents included steering the vessel and ship and machinery repair and maintenance.

Table 7. Primary work activity by flag state of vessel

	Flag state of vessel			Total	
	Taiwan	China	Other		
	%	%	%	%	n
Fishing	50%	52%	49%	50%	61
Butchering	13%	10%	21%	15%	18
Freezing/storage	11%	10%	10%	11%	13
Cleaning	6%	10%	3%	6%	7
Engine room work	3%	14%	5%	6%	7
Cooking	5%	0%	0%	2%	3
Other	11%	5%	13%	11%	13
Number of respondents (N)	**62**	**21**	**39**		**122**

3.4.4 Hazardous and Degrading Work

The majority of workers reported exposure to some risk to their health or safety, most commonly extreme heat or cold (85%), lifting heavy loads (70%), and sharp or dangerous tools or machinery (65%) (Table 8). Sharp and dangerous tools include knives, hooks, bone cutters, and head spikes used to kill fish. Several workers described risks associated with machinery. When asked about dangerous work, one replied:

> *"Yes—like guarding the ammonia compressor unit [part of the freezing system for fish], which is dangerous for the lungs, especially if a pipe leaks. It's dangerous for breathing even with a mask because it's a gas, it penetrates the mask."*
>
> *—Fisher*

Another said:

> *"Yes, when we are in port unloading fish, we use a crane. When we lift the catch with the crane and the line breaks, it can fall on people. There was a case where someone was crushed and died on the spot. The fish load was lifted by the crane, the rope snapped, and the load fell on someone. The weight can be hundreds of tons."*
>
> *—Fisher*

Other common risks included drowning (42%), for example when washed overboard or diving to fix tangled lines, and risk of falling from a height (37%). When asked what other risks they faced, one-fourth of respondents mentioned working in conditions of big waves, strong winds, or storms. A squid fisher recalled:

> *"I almost fell into the sea while installing lamps. The vessel was moving during a storm. When the waves came, we almost fell—two of us. If we fell at night, we would die."*
>
> *—Fisher*

Another fisher said:

> *"For example, when there's a big wave and we're told to work, told to do things and we push ourselves. The risk is high when the waves are big. I have experienced that before. The risk is high. We get hit by waves so that my leg was struck. Luckily, I didn't die."*
>
> *—Fisher*

Workers on China-flagged vessels reported the highest exposure to hazards across all but one type of hazard, extreme temperatures, which was similar for those on Taiwan-flagged vessels (89%) and China-flagged vessels (83%).

Table 8. Exposure to hazards by flag state of vessel[1]

	Flag state of vessel			Total	
	Taiwan	China	Other		
	%	%	%	%	n
Extreme heat or cold	89%	83%	76%	85%	82
Lifting heavy loads	66%	100%	66%	70%	68
Sharp or dangerous tools or machinery	61%	75%	69%	65%	63
Risk of drowning	39%	67%	38%	42%	41
Risk of falling from height	45%	50%	17%	37%	36
Other: Big waves, strong winds, or storms	21%	33%	24%	24%	23
Other: Miscellaneous	11%	42%	7%	13%	13
Number of respondents (N)	**56**	**12**	**29**		**97**

[1] Multiple responses possible.

3.4.4.1 Illnesses and Injuries

Nearly one-third (31%) of workers have been hurt or become sick because of the job, including 37% of those on Taiwan-flagged vessels, 29% of those on China-flagged vessels, and 23% of those on vessels with other flags. The types of injury or illness varied widely and included injuries to hands and feet, back pain, fever, headache, and toothache. Some (7%) said that they were required to work when seriously sick or injured (see Box 1 on the next page).

Box 1. Surya

Surya, a 24-year-old fisher, recently completed a contract on a Taiwanese longline vessel targeting tuna and marlin. His primary responsibility was cleaning and freezing fish. Although he reported no deceptive recruitment, his account reveals severe hardships at sea.

He recalls going hungry when the collecting vessel arrived late and provisions ran out. The crew survived on fish innards and small fish because the captain forbade them from eating the large catch intended for sale. Surya's work schedule stretched from 4:00 p.m. until noon the next day, leaving only four hours for rest—six if the crew worked exceptionally fast. His sleeping quarters were infested with vermin, yet exhaustion left no choice:

> *"Well, we were tired from working. We just slept. The point is, we made ourselves comfortable because we were already exhausted."*

Communication with the outside world was nonexistent except during port calls every four months. At sea and in port, Surya had no access to his passport. Another mechanism to discourage early departure was withholding wages:

> *"They said, wait until the vessel departs, then it will be paid. When we are docked, we are not paid immediately. We wait until the vessel departs, then we are paid."*

When asked about the most hazardous aspect of his work, he described the risk of large fish falling on crew members—tuna can weigh hundreds of pounds:

> *"If you're not paying attention, the fish can fall onto someone. That's the most dangerous. When using the winch, fish are lifted. […] The winch line snaps. It often happens that the rope breaks, like this, being pulled. That is the most dangerous."*

Surya himself suffered a serious injury when his leg was crushed by a large drum of oil. He was given one week of rest and medicine, but:

> *"[The captain] didn't know what the medicine was, what the name was. He gave the wrong medicine. So it got worse."*

The captain dismissed his condition:

> *"It's only your toe, it's okay. If you don't want it, we'll cut it off."*

Surya explained why he endured:

> *"There was no collecting vessel. I already asked to go home, but they didn't allow it."*

Despite difficulty walking, he returned to work after three days. With one crew member down, others bore the extra burden, and the constant threat of being sent home loomed large:

> *"Many were sent home because the captain didn't like their work. […] straight home, at their own cost."*

The cost was prohibitive—approximately two months' wages:

> *"It's quite a lot. To go home from there to here is 20 million rupiah [USD $1,200]."*

He was once fined USD $255 when a fish got away. The captain enforced additional punishments for such incidents:

> *"We work one more day, one more night. That is because fish got away, that's all. […] When hauling fish, you must pull fast, not slowly. Otherwise, the fish will get away."*
> *[Interviewer: So that's the punishment if fish get away, you are told to work, no sleep. Meaning 24 hours?]*
> *"Yes."*

Despite these hardships—hunger, grueling hours, unsafe conditions, injury, and punitive practices—Surya plans to work on a foreign fishing vessel again.

Many workers reported continuing to work unless very seriously unwell:

> *"If we are sick but can still stand, we still work but given work that is more towards lighter."*
>
> *—Fisher*

Another explained:

> *"But on Chinese vessels, if you're sick, better be seriously sick so you can rest. If it's just minor injuries like mine, you still have to work. I used to react badly to seawater—small wounds became big. All 10 of us had wounds, [but they] forced to keep working."*
>
> *—Fisher*

Several workers said that they had to work while sick for fear of being sent home, which could mean paying for their own plane ticket or losing their security deposit:

> *"If you didn't work, for example if you were sick and didn't work, the threat was being sent home. […] If you went home before the contract ended, the guarantee [security deposit] wouldn't be released."*
>
> *—Fisher*

> *"Working while we are sick is really uncomfortable, we would like to rest. […] Forced to work, [the captain says] we must work even when sick, except when the sickness is already severe, then rest. […] Maybe we could be sent home."*
>
> *—Fisher*

3.4.4.2 Employer Mitigation of Risk

Working in DWF is inherently hazardous, but employers have an obligation to mitigate the risk wherever possible. The failure to mitigate risk is an indicator of involuntary work with regard to hazardous or degrading working conditions (see Section 3.4.9, Indicators of Forced Labor). Respondents were asked about employer efforts to mitigate risks.

As shown in Table 9, 42% of those facing risks reported that their employers did not provide the training needed to perform their jobs safely. A notably higher percentage of workers on Chinese vessels (68%) reported a lack of training, compared to those on Taiwanese (40%) and other (29%) vessels. One fisher explained that he received no official training before or after departure:

> *"We trained ourselves only during the voyage. A friend trained us, not the captain."*
>
> *—Fisher*

Of the respondents who faced risks, 12% indicated that their employer endangered their life by failing to take proper safety precautions. The rate was much higher among those on Chinese vessels (37%) than those on Taiwanese (5%) and other (12%) vessels. One fisher described the lack of measures during rough weather at sea:

> *"If there's [strong] wind, we often keep working. I mean, on other vessels, if there's [strong] wind, they don't work. […] It's dangerous. I'm scared. When there's wind, there are waves, so I'm afraid of falling overboard."*
>
> *—Fisher*

When he raised his concerns with the manning agent who placed him in the job, he was told, "Just obey, you're the subordinate."

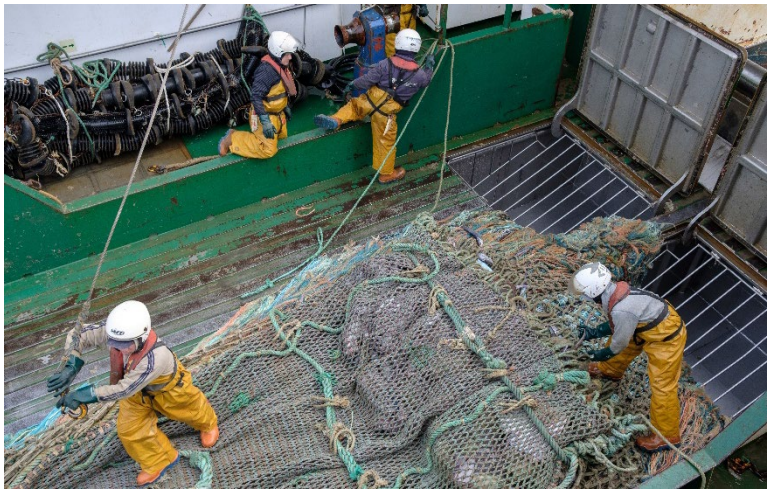
Table 9. Mitigation of risk among workers who face risk by flag state of vessel

	Flag state of vessel			Total	
	Taiwan %	China %	Other %	%	n
Employer does not provide the training needed to perform job safely	40%	68%	29%	42%	47
Employer endangers respondent's life by failing to take proper safety precautions	5%	37%	12%	12%	14
Employer does not provide personal protective equipment needed to perform job safely	7%	5%	0%	4%	5
Number of respondents (N)	**60**	**19**	**34**		**113**

3.4.4.3 Personal Protective Equipment

Only 4% of respondents reported lacking the personal protective equipment (PPE) needed to perform their jobs safely. However, qualitative data indicate that some PPE may not be in good repair or replaced as often as needed. One fisher explained:

> *"About protective work equipment, for example, if it is already damaged and we ask for a replacement, sometimes we get scolded, sometimes we get it. […] Often we argued with the person in charge of the equipment."*
>
> *—Fisher*



Fishers controlling gear on a trawler. Source: Shutterstock

All respondents were asked what types of protective gear they generally wear while working, whether provided by the employer or procured themselves. Most reported wearing shoes or boots (98%), gloves (95%), life jackets (85%), and protective clothing such as coveralls (79%). Two-thirds (64%) wore helmets, 41% wore goggles, 32% wore respirators or dust-masks, and 20% wore earplugs. Other PPE mentioned by workers included raincoats, freezer jackets, harnesses, and socks.

3.4.4.4 Violence and Verbal Abuse

In this sample, 6% of respondents reported experiencing or being threatened with physical violence. One fisher described making mistakes on board due to understaffing and being physically assaulted by the captain:

> *"They lacked workers but forced it, so efficiency was low. When there was a mistake, the captain hit me. I spoke politely, explaining the [need for more workers]."*
>
> *—Fisher*

Verbal abuse was far more common. One-fourth of respondents reported that refusing employer demands, such as working more than 14 hours per day or performing dangerous tasks, would result in verbal abuse. A fisher explained how verbal and physical abuse becomes normalized over time on some vessels:

"If your ears are thick, you just consider it like the sound of the wind. Sometimes they rant and yell, but that's normal, later they stop on their own. As for punches and kicks on board, that's kind of normal."

—Fisher

3.4.5 Work Schedules

ILO C188 requires that fishers have a minimum of 10 hours of rest per day. However, 60% of workers reported routinely working more than 14 hours daily (60% on Taiwanese vessels, 67% on Chinese vessels, and 55% on other vessels), meaning their rest hours did not meet ILO C188 standards. One worker explained:

"If the line didn't meet fish, rest time was cut—still working; then continue work again. […] If refusing, the risk is being sent home—it's the captain's order—so forced."

—Fisher

Workers are under pressure to work quickly to maximize their opportunities for sleep. One stated:

"When there is a big 'attack' of fish, we have to finish quickly. If we are slow, then we end up with less sleep."

—Fisher

Another described the competing demands to work fast but accurately, explaining that his supervisor uses a loudspeaker to demand greater accuracy:

"[My supervisor says,] 'You're already disobeying,' and tells me not to go too fast [when operating the equipment]. But we're already sleepy, it's dark too."

—Fisher

Many described working 16, 18, or even more hours. One fisher explained:

"On my vessel, we only sleep two hours [at a time]. Two hours of rest, then when we wake up, we immediately set the lines again. After setting lines, we rest again for two hours, then haul the lines again until finished. Once finished, then we sleep again. But if it's not finished, then we don't sleep. […] For setting, it's only a few hours, four hours. But hauling, sometimes if the catch is big, we don't sleep for two days. I've experienced two days without sleep. […] Sometimes the ice freezing doesn't work. The freezer is not normal. So we don't sleep either. We have to move the fish again to the freezer that can dry them."

—Fisher

The fisher added that long work hours also limit time for meals:

"Then for eating, for example, we can't just stop immediately. If we stop, the hauling can't continue. We have to do it one by one. So if the fish are many then we don't get to eat."

—Fisher

Like this fisher, 22% of workers reported being required to work non-stop without breaks during the workday (19% on Taiwanese vessels, 29% on Chinese vessels, and 23% on other vessels). Another said:

"Sometimes [the captain] tells us to work at a certain time, saying there will be a break, but there isn't. There isn't. We work until night, until the next morning. Sometimes we even have to eat standing up. Standing, eating, we stand. At most, the only way to get a break is if we really need to go to the bathroom, then we can steal that break time. Yes, Sir, life at sea is never easy."

—Fisher

3.4.6 Living Conditions

Many respondents reported concerns about their living conditions. More than one-fourth (28%) of respondents felt that their accommodations were harmful to their health (Table 10), with a much higher proportion of those on Chinese vessels (62%) reporting this concern, compared to those on Taiwanese

(27%) or other (13%) vessels. Overall, 11% did not feel safe in their sleeping quarters, and 14% did not have a safe space to store their belongings. The primary concerns regarding sleeping quarters were vermin, such as bed bugs and rats, and excessive heat or cold.

More than one-fourth (27%) reported feeling hungry because there was not enough food to eat. One respondent explained that he is often hungry because "the captain provisions too little—for several days—so it's only enough for dinner," forcing the crew to skip meals. Others described delayed arrivals of provisions that resulted in food shortages. An additional reason for hunger was insufficient time to eat due to long working hours. Overall, 10% indicated that the quality of food was poor, but the rate varied considerably by vessel flag: 43% of those on Chinese vessels reported poor quality food, compared to only 3% of those on Taiwanese vessels and 5% of those on other vessels. Some stated that the food was expired; others expressed concerns about the lack of diversity in their diet. There were also complaints about meals that did not comply with religious requirements. One fisher's account captures many of these concerns:

> *"[I feel hungry because] mealtimes are limited, Sir. Sometimes when we are still eating the foreman is already telling us to hurry up, 'hurry, work, work, work,' like that. The portion sometimes is only rice. […] But for the side dishes, Sir, we are Muslims and don't eat pork, but it is often pork that is served. Sometimes when we are off work, we only eat twice a day. […] We have instant noodles on credit from the captain, so we eat noodles at most, Sir. On working days, we eat three times a day. But that third meal is less decent. The first and second ones are okay, but the third one is less decent. The cooking is haphazard, as long as something is cooked, that's it, according to the cook."*
>
> —*Fisher*

Access to drinking water was also a serious concern, with 15% of respondents reporting a lack of access to clean drinking water, with much higher rates on Chinese vessels (38%), compared to Taiwanese (13%) and other (8%) vessels. One fisher said that each person is limited to three bottles per week, which runs out. Another described equipment failures:

> *"On Chinese vessels, there's no bottled water. Just distilled sea water made into fresh water. It's stored in tanks. Sometimes when the machine breaks, the water tastes salty, and we can't drink it. That's how it is. It's difficult when the machine breaks."*
>
> —*Fisher*

The actual risk may be higher than reported in the survey. Transcript analysis suggests that some fishers who claimed access to "clean" water relied on sources that may not be potable, such as condensation from air-conditioning units.

Table 10. Living conditions on vessel by flag state

	Flag state of vessel			Total	
	Taiwan	China	Other		
	%	%	%	%	n
Feels accommodations were harmful to health	27%	62%	13%	28%	35
Did not feel safe in sleeping quarters	14%	5%	10%	11%	14
Did not have safe place to store belongings	14%	24%	8%	14%	17
Quality of sleeping quarters					
Good	60%	62%	83%	68%	84
OK/fine	25%	29%	8%	20%	25
Bad	14%	10%	10%	12%	15
Hungry because not enough food to eat	25%	38%	23%	27%	33
Quality of food					
Good	75%	19%	73%	65%	80
OK/fine	22%	38%	23%	25%	31
Bad	3%	43%	5%	10%	13

	Flag state of vessel			Total	
	Taiwan	China	Other		
	%	%	%	%	n
Lacked access to clean drinking water	13%	38%	8%	15%	19
Number of respondents (N)	**63**	**21**	**40**		**124**

3.4.7 Freedom of Communication and Movement

3.4.7.1 Access to Communication

Insufficient access to communication was a major concern for many fishers. Although ILO C188 requires that fishers have reasonable access to communication facilities, only 35% *always* had access to Wi-Fi or another means of communication—and even then, strict data limits often prevented video or voice calls. This rate varied notably by flag state: only 5% of those on Chinese vessels always had access, compared to 29% on Taiwanese vessels and 60% on other vessels. Another 5% *usually* had access, 20% *rarely* had access, and 40% *never* had access (Table 11). A much higher percentage of workers on Chinese vessels (86%) reported never having access, compared to those on Taiwanese (43%) and other (13%) vessels. Many vessels lacked the equipment needed to provide Wi-Fi, and others had Wi-Fi on board but prohibited crew members from using it. One respondent noted being unable to communicate because his phone was confiscated.

The finding that more than half of workers (60%) never or rarely have access to communications is deeply problematic. Lack of contact with family can harm mental health and strain family relationships. It also increases vulnerability to labor abuses. Without Wi-Fi or satellite connections, fishers—already extremely vulnerable when far from shore—have no way to seek help if they are mistreated or to access grievance mechanisms to obtain remedy.

Table 11. Frequency of access to communication by flag state of vessel

	Flag state of vessel			Total	
	Taiwan	China	Other		
	%	%	%	%	n
Always	29%	5%	60%	35%	43
Usually	5%	0%	8%	5%	6
Rarely	24%	10%	20%	20%	25
Never	43%	86%	13%	40%	50
Number of respondents (N)	**63**	**21**	**40**		**124**

Several respondents noted that conditions in the DWF industry have improved during their term of employment, citing stronger regulations and better access to communication, which enables the reporting of labor abuses. A worker explained that in the past, after being injured, he was denied rest "because regulations were not strict." He believes the situation now is very different:

> *"Now if we report via Wi-Fi to Falkland or Argentina, we call them. We report violence or unfair treatment. We claim our rights. Company gets called. They are ordered to return to port. There is investigation. So we are pulled to port."*
>
> *—Fisher*

This account underscores how access to communication can transform workers' ability to assert their rights and seek protection.

3.4.7.2 Access to Important Documents

While at sea, fishers' passports were most often held by their employer or captain (85%) or by a manning agent (7%). More than one-third (39%) of workers reported being unable to access their identification documents while in port if needed. There was considerable variation by flag country: nearly

three-fourths (72%) of workers on Chinese vessels could not access their documents, compared to 40% of those on Taiwanese vessels and 17% of those on other vessels.

Many stated that they would only receive their passport after completing the contract. As one fisher explained:

> *"Only after we finish the contract can we access them [our passports]."*
>
> *—Fisher*

Some respondents said that they had access only to a photocopy of their passport. When asked why the original was withheld, one replied:

> *"Because they are afraid that we as crew might run away or escape from that country or move to another vessel."*
>
> *—Fisher*

Others noted that although they could request use of their passport for specific purposes, the document remained in the hands of the vessel representative at all times. One fisher described:

> *"If the reason is valid, it's allowed. Usually you are accompanied. For example, in the past when sending money, someone would accompany us to the remittance place, and they still held the documents."*
>
> *—Fisher*

In some cases, the question of access was moot because respondents were not permitted to leave the vessel at all, as illustrated in this exchange:

> *[Interviewer: So, have you ever tried to access your documents when you were in port?]*
> *"No, […] Because we already knew the access was limited. Restricted. We were not allowed to leave that vessel."*
>
> *—Fisher*

3.4.7.3 Port Visits

The frequency of port visits varied considerably, with 16% of respondents returning to port more than once per month, 36% every 1 to 3 months, 18% every 4 to 6 months, and 30% less often than every 6 months (Table 12). ILO C188 does not specify a limit to continuous time at sea, but ILO's guide *Towards Freedom at Sea: Handbook for the Detection of Forced Labor in Commercial Fishing* notes that "3 months between port stops can be considered a warning sign of forced labor and 6 months or more between port stops a strong warning sign" (International Labour Organization, 2023, p. 21). Extended periods at sea can lead to severe physical and mental strain, isolation, and lack of access to medical care. They also increase vulnerability to exploitation, because workers have limited opportunities to seek help or report abuse. A much higher percentage of workers on Chinese vessels (65%) reported port visits every 6 months or less often, compared to those on Taiwanese (26%) or other (18%) vessels.

As in the case of the fisher quoted in the previous section, restrictions on going ashore were common. More than one-third (36%)[13] of respondents indicated that they are not allowed to leave the vessel when in port: 67% of those on Chinese vessels, 37% of those on other vessels, and 25% of those on Taiwanese vessels. The reasons varied but were closely related and often overlapping: 22% reported that the captain did not allow it, 18% were required to work on the vessel, 11% said that the time in port was too short, and 9% lacked access to their passports or other necessary documents. For 11% of those not allowed to leave, the restriction was due to regulations in the country where the vessel was docking. Fishers were asked whether they could go ashore when docked at port. One explained:

[13] Data are based on transcript analysis. Because not all respondents provided this information, the estimate may understate the true extent of the finding.

"No, not allowed. […] We were only there for two days. They were afraid someone would run away or something."

—Fisher

Another said:

"During the contract, no, Sir. Because we don't hold our documents; they are all held by the captain."

—Fisher

A third noted:

"No. […] Because Chinese vessels don't dock. They only anchor. They don't berth."

—Fisher

Table 12. Port visits by flag state of vessel

	Flag state of vessel			Total	
	Taiwan	China	Other		
	%	%	%	%	n
Frequency of port visits					
More than once per month	8%	10%	30%	16%	19
Every 1 to 3 months	44%	5%	40%	36%	44
Every 4 to 6 months	21%	20%	13%	18%	22
Less often than every 6 months	26%	65%	18%	30%	36
Not allowed to leave the vessel in port[1]	25%	67%	37%	36%	45
Number of respondents (N)	**63**	**21**	**40**		**124**
Reason not allowed to leave vessel[1,2]					
Captain did not allow	6%	43%	20%	22%	10
Required to work on vessel	44%	7%	0%	18%	8
Time in port too short or no port visits	0%	29%	7%	11%	5
Country regulations did not permit	0%	7%	27%	11%	5
Did not have access to documents	6%	7%	13%	9%	4
Number of respondents (N)	**16**	**14**	**15**		**45**

[1] Data are based on transcript analysis. Because not all respondents provided this information, the estimate may understate the true extent of the finding.
[2] Multiple responses possible. Some respondents did not give a reason.

One respondent described the lack of freedom of movement on board:

"Each day is eight hours working and eight hours resting. When working, work; when resting, rest in the cabin and cannot go out. If you go out, the punishment is usually cleaning the vessel."

—Fisher

3.4.8 Ability to Exit Employment

A review of the transcripts identified 21 fishers who could not quit their jobs before the end of the contract because of consequences imposed by employers or recruiters. Although this represents 17% of respondents, not all respondents provided this information, so the actual proportion is likely higher. Nearly half (48%) of those on Chinese vessels could not quit, compared to 14% on Taiwanese and 5% on other vessels. The most common reason was the requirement to pay for their own return ticket to Indonesia, a prohibitive cost for many workers. In some cases, the price of a ticket equaled two months' wages. One worker recalled:

"I used to work on a vessel in Bilbao, Spain. My wife was about to give birth, and there was no one at home: my parents were already dead, my in-laws lived far away. I decided to go home and reported it to the captain. He had no problem after I showed my wife's medical records. But the agent in Indonesia said that

because I went home before the contract ended, I had to pay the return ticket. They said it was for deterrent effect, even though from the vessel's side there was no problem."

—Fisher

Others mentioned the need to pay back recruitment debt. When asked if he could stop working on the vessel if he wanted, one fisher replied:

"Yes, but the risk is like that. For example if I stop, but still owe the office—if I return home still owing, then when going again owe again—the debt piles up. Sometimes I think twice; if the captain is harsh what then. So I just endure—wait until deductions finish; sometimes like that."

—Fisher

A few noted that they could leave only after the employer secured a replacement. One said that he would have to inform his employer "in advance so [a] replacement [could be] found. Because of [the] contract." When the interviewer confirmed whether with notice he would be allowed to leave, he replied that he would "as long as [a] replacement [has been] found."

The study also asked about involuntary contract extensions and found that 90% of workers had an agreed end date when they began working in their job, and 26% of these workers worked beyond that date. Most agreed to the extension, but eight workers were involuntarily extended because the vessels were still at sea or no replacement was available. One worker reported having to extend or face a large fine:

"The contract was for a year. After 8 months […] they added the contract again, making it 15 months. If we went home, we were penalized [USD] $1,000. […] If we wanted to go home, we'd be fined. A friend of mine was fined when going home because he didn't agree to add the contract."
[Interviewer: But did you personally agree to the change of end date?]
"Like it or not, agree—because it's $1,000, that's quite a lot."

—Fisher

3.4.9 Indicators of Forced Labor

The study explored the two components of forced labor described in Section 2.1, Measuring Forced Labor: involuntary work and coercion.

3.4.9.1 Involuntary Work

Most (89%) workers were found to have experienced at least one indicator of involuntary work (Table 13), which "refers to any work undertaken without the free and informed consent of the worker" (ILO, 2024, p. 5).

The most common indicator was onerous working hours or work schedule, experienced by two-thirds (65%) of workers. Circumstances giving rise to this form of involuntary work include "onerous working hours leaving little or no rest or recovery time" (ILO, 2024, p. 11). For this study, this indicator was defined as routinely working more than 14 hours per day—contrary to the 10-hour daily rest period prescribed by ILO C188—and "non-stop work without breaks during the workday" (ILO, 2024, p. 11).

Approximately half (51%) of respondents experienced hazardous or degrading working conditions. A circumstance giving rise to this form of involuntary work is "hazardous work conditions posing serious risks to health and safety" (ILO, 2024, p. 11). In this study, this is defined as the failure of the employer to mitigate the risks involved in their work (e.g., respondent reports that the employer does not provide PPE needed to perform job safely, that the employer endangers the respondent's life by failing to take proper safety precautions, or that the employer does not provide the training needed to perform work safely). Another circumstance giving rise to this form of involuntary work is "work while

seriously debilitated by sickness or injury" (ILO, 2024, p. 11).[14] This study also included verbal abuse as a degrading working condition.

Nearly half (49%) experienced recruitment linked to debt, meaning that they incurred recruitment fees or related costs that resulted in debt to their employer or recruiter.

More than one-third (35%) were not free to terminate their employment, primarily due to involuntary contract extensions while at sea, the risk of losing their security deposit, outstanding debt to their employer or recruiter, or the prohibitive expense of return travel to Indonesia—costs that workers themselves would have to bear.

One-fourth (26%) experienced degrading work-related living conditions, which is "housing imposed by the employer that is degrading, unhygienic, unsafe, overcrowded, lacking in privacy or otherwise intolerable" (ILO, 2024, p. 11).

Moreover, 13% experienced low or no wages, defined by this study as wages delayed by more than a month or due to insufficient catch or vessel breakdown.

Finally, 9% of respondents experienced deceptive or fraudulent recruitment, which "relates to the failure to deliver what has been promised to the worker, either verbally or in writing, at the time of recruitment" (ILO, 2024, p. 10). Among respondents, deceptive recruitment most frequently occurred in relation to remuneration levels, working hours, or the nature of the work.

A comparison by flag state revealed that workers on China-flagged vessels reported the most widespread experience of involuntary work indicators, including universal exposure to at least one indicator of involuntary work and notably higher levels of recruitment-linked debt, inability to leave employment, hazardous conditions, and degrading living conditions. Those on Taiwan-flagged vessels showed similarly high overall exposure but generally lower levels for each indicator than those on China-flagged vessels. Workers on vessels flagged to other states reported lower rates for most indicators, particularly for recruitment-linked debt and restrictions on ending employment. All workers on China-flagged vessels reported at least one indicator of involuntary work, compared to 97% of workers on Taiwan-flagged vessels and 70% of workers on vessels flagged to other states.

Table 13. Respondents experiencing indicators of involuntary work by flag state of vessel

	Flag state of vessel			Total	
	Taiwan	China	Other		
	%	%	%	%	n
Experienced at least one indicator of involuntary work	97%	100%	70%	89%	110
Onerous working hours or work schedule	67%	76%	55%	65%	80
Hazardous or degrading working conditions	54%	71%	35%	51%	63
Recruitment linked to debt	59%	76%	20%	49%	61
Inability to terminate employment	38%	76%	8%	35%	43
Degrading work-related living conditions	24%	57%	13%	26%	32
Low or no wages	5%	29%	18%	13%	16
Deceptive or fraudulent recruitment	8%	19%	5%	9%	11
Forced recruitment	0%	0%	0%	0%	0
Number of respondents (N)	**63**	**21**	**40**		**124**

[14] Respondents were asked, "Does your employer require you to work when you are seriously sick or injured?" and a "yes" response indicates that this indicator is present.

3.4.9.2 Coercion

Overall, 82% of workers in this study experienced at least one indicator of coercion (Table 14).[15]

The most common form of coercion was the abuse of isolation, experienced by 62% of respondents. This indicator includes the "threat or actual denial of transport away from a remote or isolated work location," "threat or actual denial of reimbursement for cost of repatriation or transport home," and "threat of or actual denial of cell phone, internet and other means of communication" (ILO, 2024, p. 16). This study defined the denial of means of communication as "rarely" or "never" having access to phone networks, radio, or Wi-Fi so that a fisher could make calls or send messages during his free time.

Nearly half of respondents (45%) experienced restrictions on their movement. In the context of fishing, this indicator includes situations in which "fishers [are] held on vessels while at port to prevent them from fleeing or from contacting unions or support organizations" and "fishers kept on distant water trips for months or even years are effectively prevented from leaving their vessel" (ILO, 2023, p. 10). This study considered fishers who returned to port less often than every six months as having effectively been prevented from leaving their vessel.

More than one-third (36%) of respondents experienced the retention of cash, assets, or identity documents. This indicator includes the "obligatory payment of substantial 'runaway fee' [security deposit] to recruiter or employer at the beginning of the job" and the "obligatory surrender of, and denial of on-demand access to, identity documents" (ILO, 2024, p. 17).

Nearly one-third (29%) of respondents experienced debt bondage or manipulation of debt, which includes "debt linked to a loan provided by employer in exchange for labor" and "debt to recruiter or employer linked to unlawful recruitment practices" (ILO, 2024, p. 17). Both ILO C188 and Indonesia's law on the Protection of Indonesian Migrant Workers (2017) require employers to cover all recruitment costs, and this study applies a threshold of recruitment costs exceeding one month's earnings as an indicator of debt bondage.

Around one-fourth (24%) of respondents experienced abuse of vulnerability, referring to "situations in which employers take advantage of workers' vulnerable position […] to coerce them under threat of dismissal, deportation or denial of rights or privileges to perform work or accept work conditions they would otherwise refuse" (ILO, 2023, p. 10). The ILO notes that "forced labor is more likely in cases of multiple dependency on the employer" (ILO, 2023, p. 10), a condition that clearly applies to fishers who rely on their employers for employment, food, water, accommodation, access to shore, and travel arrangements to return home. In this study, abuse of vulnerability most often took the form of threats of dismissal.

Less common forms of coercion included physical violence (6%) and withholding of wages (5%).

Comparison by flag state shows clear differences in reported coercion. Workers on China-flagged vessels consistently reported the highest levels across all forms examined, followed by workers on Taiwan-flagged vessels. Workers on vessels flagged to other countries reported the lowest levels across all indicators. All workers on China-flagged vessels reported at least one indicator of coercion, compared to 89% of workers on Taiwan-flagged vessels and 63% of workers on vessels flagged to other states.

[15] "Involuntary work, in and of itself, is a necessary but insufficient condition for forced labor" (International Labour Organization, 2024, p. 9). Most survey questions investigating involuntary work were followed by a question to determine the presence of coercion. For example, interviewers asked, "Does your employer require you to work when you are seriously sick or injured?" and if the respondent responded in the affirmative, the interviewer then asked, "What would happen if you refused to work while sick or injured?" For this study, a worker must have experienced both involuntary work and coercion during the same employment stage (recruitment, employment, or separation) to be classified as a case of forced labor.

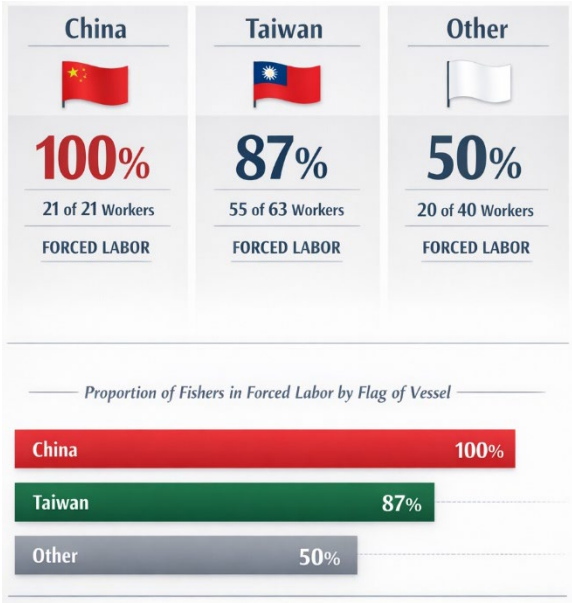
Table 14. Respondents experiencing indicators of coercion by flag state of vessel

	Flag state of vessel			Total	
	Taiwan	China	Other		
	%	%	%	%	n
Experienced at least one indicator of coercion	89%	100%	63%	82%	102
Abuse of isolation	70%	95%	33%	62%	77
Restrictions on workers' movement	41%	81%	33%	45%	56
Retention of cash, assets, or identity documents	38%	67%	18%	36%	45
Debt bondage or manipulation of debt	33%	48%	13%	29%	36
Abuse of vulnerability	21%	38%	23%	24%	30
Physical violence	8%	14%	0%	6%	8
Withholding of wages	5%	14%	0%	5%	6
Number of respondents (N)	**63**	**21**	**40**		**124**

3.4.9.3 Forced Labor Findings

As mentioned previously, a worker is considered to have experienced forced labor if they reported at least one indicator of coercion and one indicator of involuntary work during a stage of employment (recruitment, employment, or separation). Overall, 77% of workers experienced forced labor. Indicators of both coercion and involuntary work were often present across multiple stages. Specifically, 27% of workers reported both during recruitment, 74% during employment, and 30% during separation.

Figure 2. Forced labor rates by flag of vessel



Differences in the rate of forced labor by flag of vessel were striking (Figure 2). As documented throughout the preceding sections, workers on China-flagged vessels consistently reported more severe and restrictive labor conditions than those on vessels flagged to Taiwan or other countries. Fishers on Chinese vessels reported the lowest average earnings, the greatest difficulty accessing their wages, and the highest exposure to occupational hazards, combined with widespread lack of safety training and reports that employers endangered workers' lives by failing to take basic precautions. Living conditions were also markedly worse for this group, with far higher reports of unhealthy accommodations, poor food quality, and lack of access to clean drinking water. China-flagged vessels further exhibited high levels of isolation and control, including the highest rates of workers reporting no access to communication, inability to access identity documents, infrequent port visits, and restrictions on shore leave. Nearly half reported being unable to quit their jobs before the end of their contracts due to employer-imposed consequences. These patterns are reflected in the forced labor rates by vessel flag. All of the workers on China-flagged vessels were in forced labor, compared to 87% of those on Taiwan-flagged vessels and half of those on vessels flagged to other countries.[16]

Table 15 presents the rate of forced labor across demographic and occupational characteristics. No consistent pattern emerged by age group, but respondents aged 35 to 44 experienced the lowest rate of

[16] Forced labor cases occurred on vessels with flags from Japan, Kenya, Malaysia, Micronesia, Portugal, South Korea, Spain, the United States, and Vanuatu.

forced labor (63%). Differences in the rate of forced labor by education were modest: the percentage of workers experiencing forced labor was slightly lower for those who completed senior high or higher (76%), followed by those who completed only junior high (78%) and those who completed primary or less (80%).

Patterns in the rate of forced labor by birthplace were more pronounced, with 73% of respondents born in Java experiencing forced labor, compared to 89% of those born in Sumatra. Within Java, 68% of those born in Central Java experienced forced labor, and all 11 (100%) of the respondents born in West Java experienced forced labor. These contrasts warrant further investigation to identify the underlying causes.

The rate of forced labor also varied by level of experience, with 71% of those with experience on 3 or more vessels experiencing forced labor, compared to 79% of those who had worked on 2 vessels and 86% of those with experience on only 1 vessel. It may be that workers with more experience have greater ability to secure assignments on vessels with comparatively better conditions.

There was little variation in the rate of forced labor by primary work activity: 76% of those whose primary work activity was not fishing experienced forced labor, compared to 79% of those whose primary work activity was fishing.

Vessel type and species type showed notable differences. The lowest rate of forced labor was observed on trawlers (56%); squid jiggers showed a higher rate (74%), and longline vessels had the highest rate (87%). Workers on vessels targeting tuna and tuna-like species reported the highest rate (88%), followed by those catching large pelagics (85%) and squid (80%). Vessels targeting Pacific chub mackerel had a lower rate (72%), and the lowest rate was among those catching groundfish (53%). These findings suggest that fishing for high-value, highly migratory species, such as tuna and squid, may be associated with a greater risk of forced labor, likely due to longer voyages, intensive work demands, and economic pressures to maximize catch.

Workers who reported transshipment—offloading catch to another vessel while at sea—experienced forced labor at a markedly higher rate than those who did not: 91% of respondents involved in transshipment experienced forced labor, compared to 67% among those who did not engage in transshipment. See Section 3.5.2.2, Transshipment, for further discussion.

Taken together, these findings suggest that several factors are associated with elevated risk of forced labor: working on Chinese- or Taiwanese-flagged vessels; being new to DWF; serving on squid jiggers or longline vessels; targeting high-value species such as tuna, other large pelagics, and squid; and working on vessels engaged in transshipment. These factors are likely to be interrelated rather than independent. Workers on Chinese-flagged vessels were, on average, newer to DWF and substantially more likely to report transshipment, suggesting that multiple high-risk characteristics often co-occur within the same operational settings. Overall, the findings underscore the importance of operational features, particularly vessel flag, vessel type, species targeted, and offshore transfer practice, in shaping forced labor risk. However, these results should be interpreted with caution due to the small sample size, and further research is needed to better understand the relationships between demographic and work characteristics and forced labor in DWF.

Table 15. Percentage experiencing forced labor by worker characteristics

	%	n	N
Experienced forced labor	77%	96	124
Age (years)			
18–24	76%	13	17
25–34	86%	51	59
35–44	63%	20	32
45+	75%	12	16

	%	n	N
Highest education level completed			
Completed primary or less	80%	24	30
Completed junior high	78%	31	40
Completed senior high or higher	76%	41	54
Region of birth			
Java	73%	61	83
Sumatra	89%	17	19
Other	81%	17	21
Number of foreign fishing vessels worked on			
1	86%	37	43
2	79%	15	19
3	71%	15	21
4 or more	71%	29	41
Primary job activity			
Fishing	79%	48	61
Non-fishing	76%	48	63
Type of vessel			
Longline vessel	87%	48	55
Squid jigger	74%	29	39
Trawler	56%	9	16
Other	71%	10[1]	14
Flag of vessel			
China	100%	21	21
Taiwan	87%	55	63
Other	50%	20[2]	40
Species of catch[3]			
Tuna and tuna-like species	88%	53	60
Large pelagics	85%	33	39
Squid	80%	24	30
Pacific chub mackerel	72%	18	25
Groundfish	53%	8	15
Other	78%	25	32
Transshipment			
Yes	91%	49	54
No	67%	47	70

[1] Forced labor cases occurred on seiner, trap setter, and gillnetter vessels.
[2] Forced labor cases occurred on vessels with flags from Japan, Kenya, Malaysia, Micronesia, Portugal, South Korea, Spain, the United States, and Vanuatu.
[3] Multiple responses possible.

These findings reveal that forced labor remains widespread among Indonesian crews. Payment delays, restrictions on movement and communication, hazardous work, and very long hours are common features of the work environment. Critically, 60% of workers said that they could not raise concerns about their conditions without fear of retaliation, underscoring the lack of safe reporting mechanisms. Yet, despite these risks, 85% reported that they plan to work on a foreign fishing vessel again, reflecting strong economic pressures and limited alternatives on shore. This combination of persistent coercion and continued willingness to return highlights the urgent need for reforms that reduce forced labor indicators and expand practical access to grievance mechanisms and onboard connectivity, so that future employment offers real improvements in safety and fairness.

3.5 SUPPLY CHAIN DYNAMICS AND RISK PATHWAYS

This section explores how risk pathways in DWF supply chains unfold from harvest to end market compliance. It describes the supply chain broadly and reports findings related to vessels on which respondents experienced forced labor (hereafter referred to as "target vessels").

The discussion begins by describing the fishing grounds and regional governance gaps that create vulnerabilities at the point of catch. From there, it examines fleet-level risk factors, including mismatches between flag states and captains and the widespread use of transshipment, which obscure accountability and complicate traceability. The discussion then moves to ports of call and aggregation points, at which seafood enters commercial systems and interventions can be most effective. Next, it addresses processing and export dynamics, showing how co-mingling during processing erodes transparency and amplifies risk across species-specific supply chains such as tuna, squid, and groundfish. Finally, the section considers end market requirements and regulatory pressures, highlighting the need for event-level traceability and compliance with evolving U.S. and EU standards. Together, these subsections provide a comprehensive view of how operational practices and structural gaps shape forced labor risk throughout the global seafood supply chain.

3.5.1 Fishing Grounds and Regional Risks

Table 16 summarizes the fishing grounds reported by workers on target vessels and verified through AIS tracking data, highlighting both the geographic spread and associated supply chain risks. The Northwest Pacific (29 vessels) shows frequent proximity to major transshipment and processing hubs, increasing the likelihood of co-mingling with seafood linked to forced labor. The Western and Central Pacific (21 vessels) presents similar risks during landings in Pacific Island State ports. Seasonal squid activity in the Southwest Atlantic (10 vessels) is tied to frequent visits to Uruguay, where ports are considered high risk for unlading seafood produced under forced labor or trafficking conditions. The Northeast Atlantic (18 vessels) illustrates the limits of European port authorities, with port visits to both Portugal and Spain, and the presence of under-researched processing hubs in West Africa, and the Western Indian Ocean (10 vessels) reflects a high-intensity tuna footprint and elevated co-mingling risk.

Table 16. Supply chain risks of fishing ground areas of target vessels (AIS tracking data)

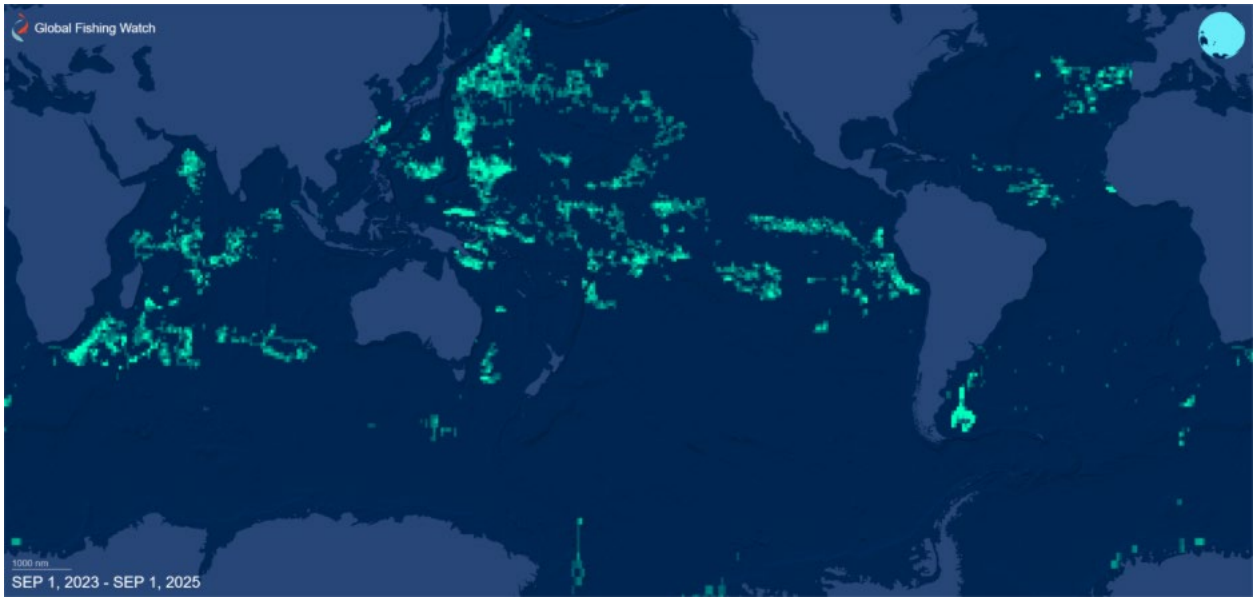
Fishing ground area	Number of vessels	Supply chain risk
Northwest Pacific (Japan/Korea/Taiwan)	29	Frequent proximity to large transshipment and processing hubs, which increases risk of co-mingling with forced labor-linked seafood
Western/Central Pacific	21	Risk of co-mingling catch produced with forced labor tuna during landing in Pacific Island State ports and processing hubs
Southwest Atlantic (Argentina/Falklands region)	10	Seasonal squid activity and frequent visits to Uruguay, at ports at high risk of unlading seafood produced with forced labor or human trafficking[17]
Northeast Atlantic (near Portugal and Spain, as well as West Africa)	18	Highlights limit of port authorities (operational capacity, integrated labor inspection protocols to prevent co-mingling of high-risk seafood) in European states and the burgeoning processing hub in West Africa (Senegal, Guinea, Sierra Leone)
Western Indian Ocean	10	High-intensity distant water tuna footprint in the Indian Ocean; increased likelihood of co-mingling product from high-risk vessels

Figure 3 shows the global spread of fishing activity by target vessels, demonstrating that these operations occur across all major ocean basins. The footprint aligns with well-known high-productivity fishing

[17] A key informant mentioned Uruguayan ports as at risk for forced labor and human trafficking.

grounds for species such as tuna and squid, indicating that forced labor risk is not confined to remote "hidden" corners of the ocean but overlaps with mainstream, heavily fished areas that support the global seafood supply. In this sense, the activity is often overlooked rather than concealing itself: vessels operate in plain sight within established and well-known fishing corridors.

Figure 3. Global fishing footprint of target vessels



Source: GFW, 2025

3.5.1.1 RFMOs and Multi-Jurisdiction Networks

RFMOs are the principal international governance bodies for fisheries beyond national jurisdiction and, in some cases, for shared stocks that extend into EEZs. RFMOs sit within the wider family of regional fishery bodies and can be either species-specific (such as the tuna RFMOs) or area-based organizations that manage broader sets of stocks and activities within a defined geographic region. They are established under international agreements and have binding authority to adopt conservation and management measures, such as catch limits, gear restrictions, and vessel monitoring requirements, within their respective areas of competence. RFMOs also coordinate scientific advice and support monitoring, control, and surveillance, and are recognized in international fisheries governance processes as central actors for combating IUU fishing.

However, RFMO mandates are narrowly focused on resource sustainability and compliance with fishing rules. As discussed in Section 3.1, RFMOs historically have not regulated labor conditions or crew welfare, nor do they have enforcement mechanisms for human rights violations. This creates a governance gap in which vessels may be subject to robust monitoring for IUU fishing compliance while labor violations go unexamined. The Western and Central Pacific Fisheries Commission's (WCPFC) adoption of binding crew labor standards in December 2024 (Conservation and Management Measure 2024-04) represents an important exception as the first binding labor standards measure adopted by any RFMO, although implementation has been delayed until 2028 (World Wildlife Fund, 2025; WCPFC, 2024).

AIS-derived vessel activity from this study indicates a multi-jurisdiction footprint spanning multiple RFMOs. This distribution means that compliance regimes, IUU exposure, and enforcement pathways are not anchored to any single regional body. Approximately 66.3% of apparent fishing hours fall within the four tuna RFMOs (WCPFC, the International Commission for the Conservation of Atlantic Tunas, the Indian Ocean Tuna Commission, and the Inter-American Tropical Tuna Commission), and the remaining

34% occur in high seas RFMOs with broader mandates, notably the South Pacific Regional Fisheries Management Organization (SPRFMO), the Southern Indian Ocean Fisheries Agreement, the North Pacific Fisheries Commission, and the North East Atlantic Fisheries Commission.

Table 17. RFMOs, implicated species, and percentage of fishing footprint (September 1, 2023–September 1, 2025)

RFMO	Implicated species and gear	Top 3 flag states	% of fishing footprint
WCPFC	Tuna and tuna-like species, billfish, some squid activity	Taiwan: 62.3%, China: 23.7%, South Korea: 6.2%	28.6%
International Commission for the Conservation of Atlantic Tunas	Tuna and tuna-like species, billfish, squid, some trawl-associated species	Taiwan: 45.4%, China: 21.8%, Spain: 12.3%	15.8%
Indian Ocean Tuna Commission	Tuna and tuna-like species, billfish, squid	Taiwan: 82.2%, China: 8.8%, Japan: 8.1%	14.3%
SPRFMO	Predominantly longline-associated species and squid activity	China: 46.8%, Taiwan: 26.7%, South Korea: 10.9%	12.6%
Southern Indian Ocean Fisheries Agreement	Predominantly longline-associated species	Taiwan: 89.5%, Japan: 10.4%, Spain: 0.1%	11.1%
North Pacific Fisheries Commission	Predominantly longline-associated species and some squid activity	Taiwan: 76.8%, China: 13.2%, South Korea: 5.3%	8.5%
Inter-American Tropical Tuna Commission	Tuna and tuna-like species, billfish, squid	China: 75.7%, Spain: 14.6%, South Korea: 8.3%	7.6%
North East Atlantic Fisheries Commission	Mostly longline-associated species	Portugal: 99.9%, Spain: 0.1%, Falkland Islands: <0.0%	1.5%

Source: GFW, 2025, percentage calculated as each RFMO's share of total Apparent Fishing Hours

This multi-RFMO footprint compounds the labor governance gap in several ways. First, no single RFMO has visibility into a vessel's complete operational pattern when that vessel moves across management areas. Second, monitoring, control, and surveillance capacity and transparency requirements vary across RFMOs, creating opportunities for regulatory arbitrage—vessels can concentrate effort in areas with weaker oversight. Third, the fragmentation reinforces the separation between fisheries compliance (which RFMOs monitor) and labor conditions (which remain the province of flag, port, and sending states that rarely exercise their authority).

Governance in squid fisheries is even more fragmented. Extensive high seas squid fishing efforts occur adjacent to South American EEZs in areas with comparatively weak region-wide controls (Seto et al., 2023). Unlike tuna, which falls under species-specific RFMOs with established observer programs and catch documentation schemes, much of the global squid catch occurs in regulatory gaps in which no RFMO exercises comprehensive management authority.

Taken together, the multi-RFMO distribution of fishing activity documented in this study underscores that forced labor risk is not confined to remote corners of the ocean but overlaps with mainstream, heavily fished areas governed by established international bodies. The challenge is that these bodies, with one recent exception, do not address labor conditions, leaving enforcement to flag and port states that often decline to act.

3.5.2 Fleet-Level Risk Factors

3.5.2.1 Flag–Captain Mismatches

Port call patterns in which the flag state differs from the captain's country of origin may indicate beneficial ownership structures that diverge from the vessel's nominal registration, complicating enforcement and supply chain traceability, even though the flag state retains clear legal jurisdiction over labor conditions under UNCLOS Article 94.[18] Misalignment between flag state and captain's country of origin weakens supply chain traceability because seafood may be harvested under one jurisdiction's oversight, moved and consolidated through service ports and carriers operating under different flags, and then processed and exported under yet another set of authorities. This sequence of jurisdictions makes it difficult for regulators to reliably link finished products back to specific vessels, owners, and companies and to prosecute responsible parties.

Among target vessels, there were several cases in which Taiwan-flagged target vessels with China-origin captains showed repeated port activity in Taiwan alongside regular use of key Indian Ocean service and landing hubs (including Mauritius, Sri Lanka, Seychelles, and Malaysia) (Table 18). This is consistent with supply chains that rely on multi-jurisdiction networks even when the vessel's outward registration remains constant. In this context, repeated routing through these hubs is consistent with China-linked fleets. Documented linkages to Chinese entities are clearest in port infrastructure and logistics: for example, China Merchants Port operates Sri Lanka's Hambantota port and is linked to terminal operations in Colombo, and Malaysia's Kuantan port–industrial development involves Chinese state-linked port/logistics interests (e.g., Guangxi Beibu Gulf Port Group). At the same time, the largest clearly documented tuna-processing assets in this hub set are not necessarily Chinese-owned (e.g., Thai Union's IOT in Seychelles, Princes Tuna in Mauritius), underscoring why due diligence should track both logistics control and processing ownership rather than relying on flag state alone.

The study also found several cases in which target vessels registered to Pacific Island states (Micronesia, Nauru, Papua New Guinea, and Vanuatu) were captained by individuals from Taiwan. These vessels regularly operated through Taiwan ports and made repeated stops across Pacific Island states, including the Marshall Islands, Papua New Guinea, and Solomon Islands. These patterns strongly suggest a UBO not registered to these vessels.

Table 18. Select target vessels, flag state, captain nationality, ports of unlading

Vessel	Flag state	Captain origin	Main port call countries by dwell time
1	Taiwan	China	Taiwan, Mauritius
2	Taiwan	China	Sri Lanka, Mauritius, Malaysia
3	Taiwan	China	Taiwan, Sri Lanka, Malaysia
4	Taiwan	China	Seychelles, Malaysia
5	Micronesia	Taiwan	Taiwan, Micronesia, Tuvalu, Kiribati, Solomon Islands
6	Nauru	Taiwan	Marshall Islands, Papua New Guinea, Philippines

[18] A UBO operates independently of flag state registration and is often deliberately obscured through corporate structures spanning multiple jurisdictions. When port call patterns reveal systematic mismatches between a vessel's flag state, the captain's nationality, and the ports regularly visited, this suggests control by entities not registered to the vessel in official records. For example, a vessel flagged to a Pacific Island state, captained by a Taiwanese national, and repeatedly calling at Taiwan ports likely indicates Taiwanese beneficial ownership, despite the Pacific Island flag registration. These port call patterns serve as operational fingerprints that can reveal actual ownership and control structures when official registry data are incomplete or deliberately opaque. The multi-jurisdictional nature of these patterns—with different states controlling vessel registration, crew nationality, port access, processing facilities, and logistics infrastructure—creates enforcement gaps because no single authority has visibility into the complete supply chain or clear responsibility for investigating labor violations that may occur across this dispersed network. In other words, the problem is enforcement visibility gaps across multiple jurisdictions, not ambiguity about which jurisdiction's laws apply to labor conditions on the vessel.

Vessel	Flag state	Captain origin	Main port call countries by dwell time
7	Papua New Guinea	Taiwan	Taiwan, Papua New Guinea, Solomon Islands
8	Vanuatu	China	Samoa, Fiji

Source: Worker interviews and Marine Tracker

Taken together, these discrepancies reinforce a central due diligence implication: flag state alone is a poor proxy for operational control or accountability, and tracing forced labor risk requires attention to the wider fleet "ecosystem" of captains, service ports, and commercial networks that enable distant water operations and connect catch to processing and export pathways.

3.5.2.2 Transshipment

Transshipment, also known as at-sea transfers, is not only a logistics practice in DWF but also a structural risk multiplier for labor oversight and supply chain transparency. Transshipments allow fishing vessels to stay at sea for long periods without returning to port, reducing opportunities for inspection, worker engagement, documentation checks, crew changes, and independent observation. For supply chains, the key consequence is that chain of custody can be obscured before any landing occurs: catch may be moved off the catching vessel, consolidated with catch from other vessels, and then delivered onward under a different vessel identity and documentation. As discussed previously, transshipment is linked to forced labor, with 91% of respondents involved in transshipment experiencing forced labor and 49 of 96 respondents who experienced forced labor reporting transshipment.

The study explored transshipment among target vessels by using AIS data to identify at-sea encounters between vessels (Figure 4).[19] The analysis distinguished between two encounter types because they imply different supply chain pathways and oversight risks. A fishing–carrier (reefer) encounter occurred when a fishing vessel met a carrier, which is a specialized transport vessel designed to receive catch and move it onward. These events often indicate offshore consolidation, although AIS does not confirm what was transferred. A fishing–fishing encounter occurred when two fishing vessels met at sea. These meetings may involve transfers of catch, fuel, supplies, or crew, or coordination between vessels, but they do not indicate large-scale consolidation in the same way as carrier activity.

[19] A vessel encounter represents a *possibility* of crew or seafood transshipment. Events are the result of rule-based algorithms being applied to AIS positional data. GFW classifies an event as an encounter when 2 vessels are detected (1) within 500 meters of one another, (2) for a duration of at least 2 hours traveling at a median speed of less than 2 knots, and (3) located at least 10 kilometers (5.4 nautical miles) from a coastal anchorage. The positions are interpolated/extrapolated onto a 10-minute grid (because AIS broadcasts are irregular), so the 500 meter proximity is based on modeled positions rather than a direct measurement. There are many potential reasons for vessels to meet at sea. Such interactions may include transshipment of catch or supplies, equipment transfers, crew changes, safety-related matters, and more.

Figure 4. Vessel encounters across both carrier and fishing vessels identified through AIS data

Source: GFW, 2025

The analysis found that target vessels were involved primarily in encounters with carrier vessels (88%) rather than with other fishing vessels (12%). Target vessels most frequently encountered carrier vessels in two regions: the Western Indian Ocean, with 42 recorded events, and the Western and Central Pacific, with 25 events. There were also several encounters between fishing vessels in the South Atlantic, suggesting that some vessels registered as fishing vessels may also function as carriers.

As shown in Table 19, across 95 events involving encounters between target vessels and carriers, the carrier vessels were most frequently flagged to China (33 encounters; 35%) and Taiwan (30; 32%), followed by Panama (12; 13%) and Vanuatu (9; 10%). Fishing vessels involved in these encounters were predominantly flagged to China (52) and Taiwan (39), with a smaller share flagged to South Korea (4).

Table 19. Carrier encounters by fishing vessel flag

Fishing vessel flag state	Carrier flag state	Encounter events (n)	Share of all encounter events
China	China	33	35%
	Panama	10	11%
	Vanuatu	5	5%
	South Korea	3	3%
	Singapore	1	1%
Taiwan	Taiwan	30	32%
	Vanuatu	4	4%
	Singapore	3	3%
	Panama	1	1%
	Japan	1	1%
South Korea	South Korea	3	3%
	Panama	1	1%

Source: GFW, 2025; worker interviews

The large presence of China- and Taiwan-flagged carrier vessels (66%) suggests a limited number of carrier "systems" comprising operators, port agents, and service networks accounting for the majority

of transshipment related to the target vessels. A company seeking to avoid sourcing from a fishing vessel flag state linked to forced labor would also consider avoiding the flag states of the carrier vessels (e.g., Panama and Vanuatu). For companies sourcing seafood that may move through these carrier networks, this concentration heightens the risk of co-mingling.

Limiting due diligence to landing ports or processor documentation fails to address a critical upstream risk of product co-mingling. Effective risk management should therefore prioritize transshipment as a key control point. Several key informants recommended prohibiting transshipment or, at a minimum, verifying declarations of non-transshipment against vessel encounter records derived from tracking data. They further advised that any supply chain dependent on frequent at-sea transfers should be classified as high risk unless it can provide credible, event-specific chain-of-custody documentation and independent verification that no product was transshipped. However, other key informants observed that these measures may be impractical, given the industry's reliance on transshipment to sustain operations.

Experts consistently emphasized that technology alone cannot verify labor conditions or prevent abuse. AIS and other digital systems can help flag high-risk behavior, map supply chains, and corroborate crew testimony, but they cannot capture recruitment deception, wage theft, contract substitution, or onboard coercion, nor do they verify the authenticity of self-reported data from vessel owners or agents. Information gathered from KIIs further indicates that poor port-state enforcement, opaque operations—especially in Chinese and flag of convenience fleets—limited worker connectivity, and inconsistent documentation make technology-based traceability impractical as a standalone solution. For traceability to be independently verifiable, key informants interviewed stressed the need for mandatory labor-focused port inspections, validated recruitment and crew list records, reliable worker voice channels (enabled by but not limited to Wi-Fi), independent third-party assessments not paid for by vessel owners, and integration of labor data with vessel and supply chain data. In short, although technology can support transparency, it is insufficient without strong governance, independent oversight, and worker-centered safeguards, all of which the sector currently lacks.

3.5.3 Ports of Call and Product Aggregation Points

Although transshipment allows vessels to remain at sea for extended periods, eventually seafood enters commercial systems through ports. These ports serve as critical aggregation points at which catch is offloaded, stored, processed, or re-exported. An analysis of target vessel tracking data identified 965 port events during which fishing vessels remained in port for 12 hours or more. These events were concentrated in a limited number of port countries. Although tracking data cannot confirm what was offloaded, long dwell times typically indicate activities such as offloading, provisioning, crew changes, maintenance, inspections, or extended layovers.

Table 20 shows the top port countries by number of events for target vessels and by unique vessel. Taiwan accounted for the largest share of port visits (29%), followed by Portugal (19%) and the Falkland Islands (7%). Other frequently visited countries included China, the United States, Spain, Japan, and Malaysia.

Table 20. Top port countries by AIS port events for target vessels

Port country	Unique vessels (count)	Port events (count)	Share of all port visits
Taiwan	45	283	29%
Portugal	2	187	19%
Falkland Islands	18	64	7%
China	16	57	6%
United States	2	48	5%
Spain	5	33	3%
Japan	3	26	3%

Port country	Unique vessels (count)	Port events (count)	Share of all port visits
Malaysia	15	20	2%
Other			26%

Source: GFW, 2025

Port event concentration does not necessarily indicate the largest concentration of product unlading. Some ports appear frequently because a small number of vessels call repeatedly, as seen with Portugal. For this reason, the number of unique vessels visiting a port is a key indicator for targeting interventions. Ports with high repeat visits and large vessel counts, such as Taiwan, the Falkland Islands, China, and Malaysia, are ideal locations for due diligence programs, crew welfare checks, vessel inspections, and traceability monitoring.

Table 21 shows the top ports visited by target vessels. Taiwanese ports, such as Kaohsiung, serve as major aggregation and service hubs for seafood supply chains, acting as key landing points for Taiwan's distant water fleet. In contrast, remote service ports, such as those in the Falkland Islands, are ports located far from a vessel's flag state that provide essential services for long-range operations. These ports appear frequently in tracking data for vessels using squid jiggers and trawlers because they enable refueling, provisioning, maintenance, and offloading without requiring vessels to return to their home country. This reliance on remote service ports reflects the operational model of distant water fleets, which prioritize extended time at sea and logistical support far from national jurisdictions.

Table 21. Top ports visited by vessels with cases of forced labor[20]

Port	Country flag	Unique vessels (count)	Port events (count)
Kaohsiung	Taiwan	22	92
Telok Ramunia	Malaysia	21	32
Stanley	Falkland Islands	18	80
Busan	South Korea	14	27
Cape Town	South Africa	13	30
Berkeley Sound	Falkland Islands	13	29
Donggang	Taiwan	12	92
Port Louis	Mauritius	10	29
Tanjung Pelepas	Malaysia	10	12
Montevideo	Uruguay	5	21

Source: GFW, 2025

Ports can either help detect and prevent labor abuse or mask it. Research combining vessel tracking with expert port risk assessments shows that labor abuse and illegal fishing risks are widespread across ports. Ports act as key hubs for both catch landings and crew movements—points at which risk can enter or be identified within the supply chain (Selig et al., 2022). Ports that host frequent transshipment or carrier activity may increase the likelihood that seafood linked to forced labor is consolidated and moved onward with minimal oversight.

From a policy perspective, ports are one of the strongest leverage points for intervention. Port-based measures are among the few practical opportunities to identify and respond to labor abuse, especially when crews can disembark, inspectors have capacity, and workers can access services or reporting channels with greater assurances of privacy and confidentiality. Conversely, short port calls and

[20] The absence of mainland Chinese ports from this list should not be interpreted as evidence that target vessels did not call at Chinese ports or that associated catch did not enter Chinese processing or trading networks. Table 21 reflects only the most frequently visited ports identified through AIS data for the vessels in this sample. Port call patterns are influenced by operational practices, transshipment dynamics, and limitations in AIS coverage, including known under-reporting in some jurisdictions. In addition, seafood linked to these vessels may enter downstream processing and export channels through carrier vessels or third-country ports, rather than through direct landings in the vessel's flag state.

immigration restrictions that prevent disembarkation can exacerbate abuse. The PSMA is designed to reduce IUU fishing by making it harder for foreign-flagged fishing and support vessels (including carriers) to land or transship IUU catch and to obtain supplies, using tools like advance notification, inspections, data exchange across authorities, and (where warranted) denial of port access. In practice, these same mechanisms can also strengthen forced labor detection and response because the conditions that enable IUU fishing often overlap with labor exploitation in distant water fleets.

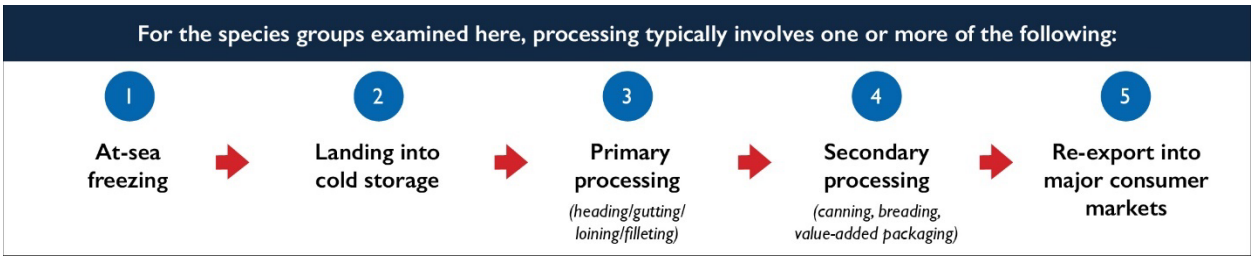
3.5.4 Processing and Export

This study traced post-capture pathways by linking worker testimony to specific vessels, then using vessel tracking to identify likely aggregation, landing, and consolidation points that shape where seafood can enter processing and export channels. After vessels were identified from interviews, AIS-based analysis was used to document port events (and, where relevant, carrier interactions that imply offshore consolidation) as indicators of where product is most likely to enter cold storage, brokerage, and industrial processing systems. Where a downstream pathway was examined in greater detail, AIS evidence was triangulated with port state and customs information to test whether port calls corresponded with documented discharge (rather than provisioning or formalities) and to characterize the plausibility of different supply chain routes. This section synthesizes these traced nodes with species-specific processing characteristics (Table 22) to identify where chain of custody most commonly degrades once product moves from vessels into cold storage, plants, and re-export networks.

3.5.4.1 Traceability From Ports

After landing, seafood is often consolidated, co-mingled, packaged, and either sold domestically or exported. For the species groups examined in this study, processing generally follows a multi-stage pathway (Figure 5). Products are often frozen at sea and then landed into cold storage, after which they undergo primary processing such as heading, gutting, loining, or filleting. In some cases, this is followed by secondary processing, including canning, breading, or other value-added packaging, before the final products are re-exported to major consumer markets.

Figure 5. DWF supply chain nodes



Source: ICF

Once seafood products are transferred from the vessel to land in cold storage, particularly when processed through large industrial plants or hub ports, traceability often deteriorates. Key informants emphasized that additional risk of co-mingling can occur inside processing plants and, in some contexts, within cold storage and consolidation nodes, particularly when buyers accept mass balance or aggregated traceability approaches. At this point, catch linked to forced labor cannot be distinguished from other product lots without robust vessel-level documentation and auditable chain-of-custody controls. This creates a central challenge: after landing, trade data alone cannot differentiate product origin. As a result, risk management must focus not only on vessels but also on suppliers, processors, and verified traceability systems.

Current regulations do not fully address this issue. EU rules require catch certificates and related documentation to support legality verification throughout trade, including when processing occurs

outside the flag state. The Seafood Import Monitoring Program (SIMP) relies on import reporting and recordkeeping for covered species.

In practice, this means that even when forced labor allegations are vessel-specific, downstream risk quickly becomes lot- and facility-based. Effective traceability controls must therefore extend beyond fishing vessels to include traders, processors, and logistics actors that manage aggregation. The best available tool for traceability is the standard from the Global Dialogue on Seafood Traceability, but it does not yet incorporate labor risk data alongside product information.

Table 22 summarizes the typical processing characteristics for the species groups identified in worker interviews. It shows the common product forms after landing and highlights where transparency most often breaks down. For example, tuna and tuna-like species are frequently repacked or traded through brokers, creating risk in mixed cold storage environments. Squid processing often involves co-mingling across sources and relabeling before re-export, and groundfish face similar risks during secondary processing and storage. These points of degradation illustrate why vessel-level documentation alone is insufficient and why traceability controls must extend through processing and aggregation stages.

Table 22. Processing characteristics of species groups identified in worker interviews

Species group	Common product forms after landing	Where transparency often degrades
Tunas and tuna-like species	Fresh or chilled whole, frozen whole, loins or blocks	Repacking or loining, brokered trading, mixed cold storage
Large pelagics	Frozen whole, fillets or portions	Reduction plants, repacking or relabeling, secondary processing and re-export
Squid	Frozen whole, tubes or rings, tentacles, cooked or frozen formats	Plant co-mingling across sources, relabeling, re-export via traders
Pacific chub mackerel	Frozen whole or fillets, canned in brine or oil, industrial reduction	At canneries, reduction plants, and brokered repacking and relabeling where lots are co-mingled
Groundfish	Headed and gutted frozen, fillets, blocks, minced or portion cuts, roe	Mixed cold storage, secondary processing hubs and re-export, species or area relabeling, co-mingled lots from multiple vessels

Source: Worker interviews; Financial Transparency Coalition 2023; Kinds, et al., 2025

The following subsections build on Table 22 by examining species-specific processing pathways and their implications for traceability and forced labor risk. Tuna, squid, and groundfish move through materially different processing systems—distinct product forms, different degrees of consolidation in processing hubs, and different re-export patterns—which means that the points through which traceability typically degrades (and through which risk can travel) are not the same across species. Understanding these dynamics is essential for designing effective risk mitigation strategies across global seafood supply chains.

However, one conclusion is consistent across supply chains and species. Once product leaves the vessel and enters cold storage, brokered trade, and industrial processing risk rapidly becomes lot- and facility-based because current traceability and lot management practices make product from a specific vessel increasingly indistinguishable without auditable chain-of-custody controls.

3.5.4.2 Tuna and Tuna-Like Species

Tuna processing pathways split into two dominant channels: (1) commodity tuna for canning and loins, and (2) high-value frozen tuna destined for premium retail and sashimi markets. Industrial purse seiners frequently freeze catch at sea, after which tuna is landed into port cold storage and moved to loining and canning facilities.

The global canned tuna sector is highly consolidated among three major companies—Thai Union, Fong Chun Formosa Fishery Co., Ltd. (FCF), and Dongwon Group—which control large portions of the

supply chain through integrated operations. Each company manages extensive networks of subsidiaries and partners, giving them significant influence over supply chain practices and making them key stakeholders in efforts to improve social responsibility and traceability.

3.5.4.2.1 Major Tuna Companies

Thai Union, which is headquartered in Thailand, is the largest global tuna trader and processor in the global tuna market. It oversees a network of 63 subsidiaries, 8 associated companies, and 6 joint ventures, which make up its integrated supply chain (Thai Union, n.d.-b). Thai Union sells tuna in the United States under the brand Chicken of the Sea and also supplies pet food to brands. Thai Union's tuna is sold in the United States, Europe, and Thailand (Thai Union, n.d.-a). Its production facilities are located in Canada, France, Germany, Ghana, Indonesia, Lithuania, Norway, Poland, Portugal, Thailand, Russia, Seychelles, the United States, and Vietnam (Thai Union, n.d.). It sources tuna exclusively from third-party fishing vessels rather than owning its own fleet.

FCF, which is headquartered in Kaohsiung City, Taiwan, operates an integrated tuna supply chain system, with more than 30 subsidiaries and a network of supply chain and logistics partnerships (Fong Chun Formosa Fishery Co., Ltd., 2021d). FCF engages in product trading, provides cold storage facilities in Fujian Province, China, offers logistical support to vessels in its supply chain, and oversees seafood processing (Fong Chun Formosa Fishery Co., Ltd., 2021a). It sells white meat tuna, light meat tuna, horse mackerel fillets, tuna steak, and swordfish to the U.S. market (Fong Chun Formosa Fishery Co., Ltd., 2021c).

FCF reportedly sources from more than 250 vessels and owns 30 transshipment vessels that operate in the Pacific, Atlantic, and Indian Oceans (White, 2021). FCF purchased Bumblebee Foods in 2020 and sells its tuna under the Bumblebee and Kirkland brands in the United States (Fong Chun Formosa Fishery Co., Ltd., 2021d). Bumblebee, and, by extension, FCF, have a long-standing partnership with PAFCO seafood processing, located in Levuka, Fiji (Bumble Bee Seafoods, 2015). FCF also owns seafood processing plants, such as South Seas Tuna in Wewak, Papua New Guinea, Nambawan Seafood in Malahang, Lae, Morobe Province, Papua New Guinea, and Cosmos Processing plant in Tumu, Ghana (Fong Chun Formosa Fishery Co., Ltd., 2021b). FCF also relies on a network of seafood processing factories owned by companies such as Sea Value, Chotiwat Manufacturing Public Company Limited, and Thai Union (Fong Chun Formosa Fishery Co., Ltd., 2021b).

Dongwon Group, which is headquartered in South Korea, is one of the top 3 tuna traders and operates a vertically integrated seafood supply chain with 72 global partners (Dongwon Industries, 2025a). Unlike Thai Union and FCF, Dongwon has integrated tuna purse seiners and tuna longliners into its supply chain (Dongwon Industries, 2025b). Dongwon Group owns a fleet of purse seiners and provides logistical support to entities in its supply chain, including cold storage services in Busan, South Korea (Dongwon Industries, 2025c).

Dongwon Group coordinates with partner companies such as the Galapesca Tuna Processing Co., in Ecuador, S.C.A. SA Tuna Processing and CAPSEN Tuna Processing Co., in Senegal, and processing centers in America Samoa and Busan, South Korea (Dongwon Industries, 2025a). Dongwon Group sells tuna in the U.S. market under the Starkist Tuna brand, which it purchased in 2008 (Dongwon Group, 2025).

3.5.4.2.2 Social Responsibility in the Canned Tuna Industry

Forced labor remains prevalent on longline vessels, despite corporate social responsibility programs. The isolated nature of fishing vessels and limited worker access to grievance mechanisms make enforcement difficult. Workers face high risks of retaliation, and long voyages with few port calls further reduce opportunities to report abuse. Voluntary social responsibility programs are insufficient to identify and remedy forced labor at the scale necessary to address the widespread risk in the sector.

Current traceability schemes generally rely on aggregated traceability and mass balance approaches, in which tuna is frequently handled in bulk lots that are not consistently traceable back to an individual vessel. This challenge is amplified when tuna is exported as frozen loins, canned product, or private label retail goods, in which labeling usually reflects the processor, rather than the catching vessel.

Even when processors implement social responsibility and traceability compliance protocols, tuna is commonly aggregated from multiple vessels and may pass through several jurisdictions before entering retail supply chains. These steps create repeated opportunities for co-mingling and risk dilution. Key informants emphasized that tuna frequently moves through hubs such as Ecuador, Thailand, Fiji, and Mauritius, among others, illustrating the globalized nature of tuna processing and trade. This movement may reflect directives from UBOs or requirements for integrated supply chain operations.

These realities indicate that efforts to identify and address forced labor conditions should focus on frequently visited ports and service hubs noted previously.

3.5.4.3 Squid: Blocks, Tubes and Tentacles, Rings, and Foodservice Supply Chains

Squid is typically sold as whole frozen, block frozen formats, or further processed into tubes, tentacles, and rings, often as individually quick frozen products designed for foodservice and prepared food applications (Cui et al., 2020). In many importing markets, squid is commonly marketed as generic "calamari" and moves through wholesale channels that prioritize consistent cut specifications and volume over consumer-facing brand identity (Ocean Disclosure Project, 2024). This creates a distinct traceability profile, compared to branded shelf stable seafood. Squid often enters national markets through a small number of high-volume importers and distributors, but it then becomes integrated into commodity processing streams in which vessel identifiers are rarely retained in downstream documentation accessible to buyers, auditors, or enforcement agencies.

On the global scale, squid and other cephalopods are both heavily traded and highly concentrated in specific hubs. Average global squid production has been reported at roughly 2.8 million metric tons per year (2017–2021 average), underscoring the scale of this commodity channel (Sustainable Fisheries Partnership, 2022). Trade network analysis shows that a relatively small number of countries act as key nodes linking many trading relationships, most prominently China and Spain, alongside major Asian markets such as Japan and South Korea (Ospina-Alvarez et al., 2022). In practice, this means that once squid is landed and consolidated into cold storage and processing hubs, supply chain risk becomes amplified; product from multiple vessels and trips is co-mingled into standardized frozen forms and re-exported at scale, often without vessel-level transparency.

Squid jigger at port in Taiwan. Source: ICF

3.5.4.3.1 China and the Global Squid Trade

China is repeatedly identified as a core hub in the global squid trade (Ospina-Alvarez et al., 2022). That centrality is operationally reinforced by the scale of Chinese distant water squid operations. Reporting on the Southwest Atlantic high seas squid fishery describes fleets operating for extended periods with intensive logistical support and limited regulations, conditions that elevate

risks related to labor abuses, opaque recruitment, and weak grievance mechanisms (Environmental Justice Foundation, 2025). Where ownership and control are exercised through layered corporate structures, accountability can be diluted even when abuses are credibly documented.

For example, several Chinese-linked corporate actors appear in public reporting on Southwest Atlantic squid operations. Environmental Justice Foundation documents how Qingdao Haoyang is linked to a wider corporate group (Shandong Bodelong) and describes the business model of "flagging into" Argentina through acquisitions and joint ventures to access squid fishing opportunities, while also reporting severe allegations of abuse in the fleet operating in the region (Environmental Justice Foundation, 2025). Enforcement actions also indicate that squid can directly trigger forced labor compliance responses at the border. In 2025, U.S. Customs and Border Protection (CBP) issued a Withhold Release Order against the China-flagged fishing vessel *Zhen Fa 7,* and public notices explicitly reference detained seafood "including squid," reflecting the practical reality that squid products can be implicated in forced labor enforcement when vessel-level risk is substantiated (U.S. Customs and Border Protection, n.d.).

3.5.4.3.2 Social and Environmental Responsibility in the Squid Industry

Across squid supply chains, the same structural challenge appears repeatedly: once squid is co-mingled and converted into standardized frozen formats, vessel identifiers and labor risk signals are difficult to retain or verify downstream (Monterey Bay Aquarium, 2024; Ocean Disclosure Project, 2024).

A promising complementary mechanism is voluntary supply chain disclosure. The Global Squid Supply Chain Roundtable listed source fisheries for 21 of 22 participating companies and documented common challenges buyers face in identifying fishery and vessel characteristics (Ocean Disclosure Project, 2024).

3.5.4.4 Groundfish: Fillets, Blocks, Surimi, and Double-Processing Risks

Groundfish such as cod, pollock, monkfish, and rockfish often enter global markets through pathways involving factory freezer trawlers or large catcher-processor fleets that can process and freeze catch on board. Commonly sold as frozen fillets, frozen blocks, and surimi-based products (especially pollock), these fish frequently undergo multiple processing stages across borders. A widely documented risk in these supply chains is double processing, in which fish is landed or initially frozen in one jurisdiction, exported for secondary processing (e.g., filleting, portioning, repackaging), and then exported to end destination markets. Each additional processing step increases the likelihood of co-mingling and contamination of all downstream products, raising the risk that seafood sourced with forced labor enters the supply chain.

These supply chains are largely invisible to consumers. In the United States and the EU, cod, pollock, monkfish, and other whitefish frequently enter markets as private label fillets, frozen blocks, or ingredients in prepared foods, in which buyers and consumers see a standardized product rather than a vessel-linked commodity. That standardization is exactly what makes traceability fragile: once the product is mixed in cold storage, portioned on shared processing lines, or re-exported after secondary processing, vessel-level identity can be lost or reduced to aggregate paperwork that does not reliably support labor risk attribution. For this reason, effective forced labor risk management in groundfish depends on controls in which the chain of custody remains linked to vessels.

3.5.5 End Markets: Supply Chain Transparency

Seafood importers are enacting new traceability requirements in their supply chains to address a wide variety of regulatory requirements. This area of work is evolving quickly as service providers develop technology to support this need. However, KIIs and the data they provided emphasized a persistent reality: paper-based or digital documentation of catch, vessel, and landing data alone may not prevent mixing where enforcement is weak, where product is aggregated at scale, or where chain-of-custody systems do not extend consistently through processing and re-export.

Instead, importers need to seek out technical products that require event-level records, enforce traceability throughout each stage of the supply chain, and systematically track visibility to the fishing vessel responsible for the catch. The Global Dialogue on Seafood Traceability standards provide guidance for building interoperable systems based on minimum data elements exchanged between supply chain events.

3.5.6 Regulatory Pressures for Effective Traceability

The United States has several forced labor trade enforcement authorities that prohibit the importation of goods made wholly or in part with forced labor. This includes Section 307 of the *Tariff Act of 1930,* the *Uyghur Forced Labor Prevention Act*, and the *Countering America's Adversaries Through Sanctions Act*. These legal authorities require importers of record to ensure that products, including all inputs, in U.S.-bound supply chains were not produced under forced labor conditions. CBP and the Forced Labor Enforcement Taskforce are responsible for evaluating and enforcing these legal authorities. CBP has issued numerous forced labor trade enforcement actions against fishing vessels and fleets in the past decade. Five forced labor trade enforcement actions remain active against fishing vessels and fleets (U.S. Customs and Border Protection, n.d.). The Forced Labor Enforcement Taskforce designated seafood as a high-priority enforcement sector under the *Uyghur Forced Labor Prevention Act*.

Global Magnitsky Designations were issued against 10 fishing companies: Dalian Fishing Company Ltd., Fujian Heyue Marine Fishing Development Co., Ltd., Fujian Provincial Pingtan County Ocean Fishing Group Co., Ltd., Fuzhou Honglong Ocean Fishing Co. Ltd., Heroic Treasure Limited, Mars Harvest Co., Ltd, Merchant Supreme Co.,Ltd., Pingtan Guansheng Ocean Fishing Co., Ltd., Pingtan Marine Enterprise Ltd., and Prime Cheer Corporation Ltd., under the *Global Magnitsky Human Rights Accountability Act* (Office of Foreign Assets Control, n.d.). This enables the Department of Treasury's Office of Foreign Assets Control to freeze the assets of the entities, vessels, and individuals and prohibits U.S. businesses and individuals from transacting business with them (sanctions.io, n.d.). The seafood sanctions from the Office of Foreign Assets Control also apply to more than 150 vessels and 2 individuals linked to the companies.

SIMP is widely cited as a key tool for extending documentation expectations through transshipment and processing, precisely at the stages at which co-mingling and loss of vessel-level visibility most often occur (Yozell & Shaver, 2019). SIMP is a risk-based program requiring reporting and recordkeeping from harvest to entry into U.S. commerce for 1,100 covered species, but it does not require government attestation of harvest and landing information, placing a premium on verifiable documentation and the ability to audit supply chains.

In the future, the Food and Drug Administration's *Food Safety Modernization Act* will require companies that manufacture, process, pack, or hold some forms of seafood, such as tuna, mahi mahi, and other finfish, to maintain records that demonstrate key data elements associated with Critical Tracking Events (U.S. Food and Drug Administration, 2025).

The EU is described as the world's largest seafood market, with comparatively advanced IUU-related import controls. The EU's import control approach has historically emphasized legality (Reg. [EC] No 1005/2008 and related implementing rules) and is moving toward stronger forced labor restrictions. The EU Forced Labor Regulation is expected to become applicable after a transition period. As these rules come into force by December 2027, processors and traders serving EU retailers will face rising expectations for demonstrable due diligence and traceability, especially in supply chains with high co-mingling risk.

Despite these regulatory pressures, reports estimate that a substantial share of seafood entering both the EU and the United States may be linked to illegal practices, highlighting how difficult it can be to verify origin once products move through complex trading and processing chains (Daniels et al., 2022b). Likewise, targeted investigative reporting has documented how seafood associated with severe labor

abuse can move through processing and export channels into downstream markets, including through U.S.-bound shipments identified in customs records (Associated Press, 2015).

The entry of forced labor-tainted seafood into the U.S. market also harms American seafood workers and legitimate businesses. When imported products are produced with unlawfully suppressed labor costs and then enter complex distribution channels, they can undercut the price of U.S.-harvested and responsibly sourced seafood, putting downward pressure on margins, wages, and job stability across domestic harvesting, processing, and distribution. In addition, the presence of tainted products can distort competition for compliant importers, processors, and retailers who invest in traceability and due diligence, effectively rewarding bad actors and increasing reputational and compliance risks for the broader industry. Over time, these dynamics can erode consumer trust, penalize responsible firms, and weaken the resilience of U.S. seafood supply chains.

4. CONCLUSION AND RECOMMENDATIONS

This study's findings suggest that forced labor remains a pervasive and systemic risk in DWF operations, particularly those employing Indonesian migrant fishers, with substantial implications for both the affected workers and the broader global seafood industry. Supply chain analysis shows that catch from vessels with documented forced labor enters global markets through complex networks of transshipment, carrier vessels, and processing facilities.

Among 124 respondents, 77% experienced forced labor. These abuses occurred throughout the employment cycle, from recruitment to separation, and violated international standards as well as the domestic laws of flag, sending, and port states. Abuses included extremely long working hours, hazardous tasks without training, cramped and unsanitary living conditions, inadequate food and water provisioning, restrictions on movement such as passport confiscation and denial of shore leave, debt bondage through recruitment fees, wage insecurity with delays exceeding one year in some cases, and isolation from communication and grievance mechanisms.

Extended isolation at sea is a structural driver of exploitation. Long voyages and infrequent port calls reduce oversight and delay access to grievance mechanisms. Workers reported being unable to leave vessels or access passports during port stops, reinforcing isolation. Limited connectivity prevents timely reporting of abuse; however, when Wi-Fi was available, workers successfully triggered investigations, underscoring its importance.

Opaque payment systems, characterized by multi-step wage transfers through intermediaries and lack of proof of payment, intensify these risks. Some workers reported wage arrears exceeding one year. Many also paid security deposits, which effectively restricted their ability to leave their employment freely.

The persistence of forced labor in DWF reflects broader structural and governance challenges in global seafood supply chains and fisheries. Economic desperation in sending regions like Indonesia limited access to formal employment opportunities with fair wages, and the lack of alternative livelihoods drives many workers to accept forced labor conditions. The systematic failure of multiple states to exercise their legitimate jurisdictional authority further enables this exploitation to persist, despite comprehensive legal prohibitions across multiple jurisdictions.

Addressing forced labor in DWF requires coordinated action by governments, industry, and civil society. Priorities include mandatory at-sea inspections focused on labor conditions, enforcement of zero-fee recruitment policies, expanded port inspections that include labor checks, robust vessel-level traceability systems, and improved worker access to communication and grievance mechanisms. Current voluntary corporate social responsibility initiatives are insufficient; systemic change demands binding measures and sustained commitment.

4.1 RECOMMENDATIONS

To Flag State Governments:

- Establish mandatory at-sea inspection programs for DWF vessels, with inspectors trained to identify forced labor indicators.
- Implement requirements for vessels to maintain onboard Wi-Fi connectivity, enabling crew communication with families and authorities.
- Enforce penalties that effectively deter document retention, wage withholding, and retaliatory termination practices.
- Prohibit visa rules that link a worker's legal status to a specific employer, effectively facilitating deportation before workers can pursue remedies for labor violations.
- Regulate and oversee flag state–based recruitment and manning agents, including licensing, transparency requirements, and joint accountability mechanisms with sending state recruitment actors, to prevent fee charging, contract substitution, and wage manipulation across jurisdictions.
- Engage actively in RFMO compliance and inspection mechanisms, including submitting labor-related findings to RFMO compliance committees and supporting the expansion of observer and inspection mandates to include labor conditions.
- Use bilateral agreements with sending states to operationalize labor standards, including joint inspection protocols, information-sharing arrangements, and clear responsibility for remediation when violations occur.

To Sending State Governments (Indonesia):

- Strengthen enforcement of existing zero-fee recruitment policies, with meaningful penalties for violations and accessible complaint mechanisms for workers at sea.
- Standardize wage escrow systems requiring direct electronic payment to workers' Indonesian bank accounts, with payment verification accessible before contract completion.
- Streamline pre-departure orientation programs providing workers with emergency contact information, rights awareness, and documentation of contract terms.
- Strengthen bilateral labor agreements with flag states by establishing minimum standards, inspection protocols, and remedy mechanisms.

To Port State Governments:

- Expand Port State Measures Agreement inspection protocols to explicitly include labor condition checks alongside fisheries compliance verification.
- Train port inspectors to identify forced labor indicators and provide access to confidential reporting channels for crew members.
- Negotiate with strategic countries to allow migrant fishers to access ports for key services (medical care, social services, and communications).
- Establish shore-side housing and support services, enabling crew members to disembark during port calls and access assistance if needed.
- Share labor violation information across port state jurisdictions and with relevant RFMOs to identify repeat offender vessels and beneficial owners.
- Adopt a no-tolerance anti-retaliation clause or policy with corresponding enforcement procedures.

To Market State Governments:

- Create an enabling environment for business due diligence (e.g., establish consistent expectations for industry accountability and due diligence in seafood supply chains), while also finding ways to reduce reporting burdens.
- Strengthen networks, protocols, and regional cooperation to obtain and share information across market state jurisdictions about forced labor cases in the seafood supply chain.
- Use the full weight of civil and criminal authorities to hold accountable companies and vessel owners engaged in forced labor.
- Advocate for the integration of binding labor standards into RFMO regions of oversight, building on successes such as the WCPFC's adoption of binding regional crew welfare standards (Conservation and Management Measure 2024-04).
- Leverage trade agreement negotiations to incorporate fishing labor recommendations and standards as enforceable and binding requirements for port states and flag states.[21]
- Establish public databases of vessels and beneficial owners with documented forced labor violations to inform enforcement actions.
- Support the development of technology solutions enabling real-time verification of working conditions and catch documentation.
- Issue civil penalties against importers who have been directly implicated in forced labor trade violations.
- Conduct regulatory audits of tuna, squid, and mahi-mahi importers to understand how they trace their supply chains, what information they rely on, and what steps they take to eliminate forced labor from these high-risk supply chains.
- Issue forced labor trade enforcement actions against entire fleets rather than individual vessels due to high risk of co-mingling among vessels through transshipment. Individual vessels easily change names and flags of convenience, making vessel-specific enforcement ineffective.
- Consider targeting forced labor trade enforcement actions against seafood processors that have been shown to repeatedly source seafood from vessels using forced labor.
- Revive and implement action plans to enhance traceability expansion and strengthen government ability to address IUU fishing activities and combat forced labor in seafood supply chains.
- Encourage alignment between trade enforcement actions and RFMO compliance outcomes, so vessels and fleets flagged in one system face consequences across others.

To Private Sector Actors:

Given the prevalence and pervasive nature of forced labor in DWF fleets, seafood buyers throughout the supply chain, including processors, brands, importers of record, and retailers, should collaborate to enact intensive and comprehensive programs to identify and remedy forced labor throughout seafood supply chains. The risk is particularly high with regard to tuna, squid, and other large pelagics like mahi-mahi. Given the extent of recommended reforms, companies should take a phased approach. The following remediation program should apply to all personnel aboard DWF vessels and should cover all stages of the employment cycle (recruitment, employment, and separation).

[21] In February 2026, the United States and Taiwan signed the U.S.–Taiwan Agreement on Reciprocal Trade, which includes labor-related commitments relevant to Taiwan's commercial fishing sector, including improving protection of labor rights on commercial fishing vessels, addressing the charging of recruitment fees in certain sectors, prohibiting retention of workers' identity documents, strengthening enforcement of labor laws, and prohibiting the importation of goods produced with forced labor. See Office of the U.S. Trade Representative, "Fact Sheet on U.S.-Taiwan Agreement on Reciprocal Trade" (Feb. 12, 2026). These labor provisions are expected to be implemented on a phased timeline and to go into effect over the next three to five years, illustrating one way a market state can exert leverage through trade negotiations to advance fishing labor standards.

Worker Protection and Safety

- Implement and enforce a zero-tolerance standard against physical abuse, threats, harassment, intimidation, retaliation, and improper surveillance of workers.
- Ensure immediate access to medical care, adequate food, clean drinking water, required medications, and hygienic living spaces free from pests or unsafe conditions.
- Provide workers with appropriate job training prior to vessel onboarding and PPE suited to all tasks, and maintain clear emergency procedures for medical crises and man overboard events.
- Keep all vessel tracking systems (e.g., AIS) continuously active to improve safety, transparency, and accountability.

Communication and Grievance Access

- Provide unrestricted, confidential Wi-Fi for all crew members; return any confiscated phones and supply devices.
- Maintain a fully independent, multilingual grievance channel available 24/7, capable of documenting, investigating, and resolving complaints without retaliation.

Living and Working Conditions

- Align onboard living and working conditions with widely recognized labor norms, including adequate hours of rest, proper accommodation, safe food handling, and access to health and safety protections.
- Ensure that workers can move freely on board and during port calls, with reliable access to shore leave.
- Provide secure storage for identity documents and valuables and strictly prohibit confiscation at all times.

Fair Employment and Compensation

- Repay all recruitment fees paid by workers, along with any withheld, unpaid, or improperly deducted wages.
- Provide workers with clear, written contracts in their native languages explaining pay, duties, living conditions, benefits, repatriation terms, and port call expectations.
- Maintain transparent payroll systems with accessible, verifiable records and paystubs that workers can easily review.

Recruitment and Oversight

- Minimize reliance on intermediary recruiters to reduce risk and increase accountability.
- Conduct independent worker interviews to identify issues, assess risks, and verify working conditions.
- Maintain accurate crew lists, including nationality, job roles, and length of time on board.

Monitoring of Vessels and Working Conditions

- Carry out independent inspections of vessels, of both living and working areas, especially during port visits where access is easier.
- Avoid using onboard cameras or monitoring technologies to discipline workers, surveil breaks, or restrict movement.

Traceability and Supply Chain Integrity

- Avoid aggregated or mass balance traceability approaches that obscure vessel-level details.
- Eliminate reliance on paper records or self-disclosed information; instead, adopt secure digital systems, such as blockchain, that validate vessel identity, catch records, and activity.

- Prioritize sourcing from vessels with a verified history of compliance and avoid vessels known for frequent name or ownership changes.

To Civil Society and Other Stakeholders:

Civil society and other stakeholders have established a foundation for identifying and supporting fishers subject to forced labor conditions. However, these stakeholders may wish to consider a unified approach to the following issues:

- Provide resources to worker support centers in major fishing ports that provide legal assistance, translation services, and confidential reporting channels to fishers. This may increase the impact and coverage of programming.
- Strengthen systematic documentation of forced labor cases and share findings in unified databases, allowing advocates access to use with enforcement authorities across multiple jurisdictions.
- Advocate for strengthened international frameworks explicitly addressing labor conditions in fishing vessel inspections.
- Support research on beneficial ownership structures and recruitment networks enabling forced labor in DWF operations.
- Develop uniform approaches and standards to verify forced labor remediation for fishers, such as repayment (recruitment fees, unpaid wages, etc.), return of identity documents, and improved working and living conditions.

Implementation of these recommendations requires coordinated effort from all stakeholders across the private sector, civil society, flag states, sending states, port states, and market states. Progress in eliminating forced labor from the DWF sector will require addressing both immediate labor violations and underlying governance failures that enable exploitation to persist despite comprehensive legal prohibitions.

APPENDIX 1: REFERENCES

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APPENDIX 2: METHODOLOGY SUPPLEMENT: IDENTIFYING VESSELS AND DOCUMENTING VESSEL MOVEMENT

Vessel Identification

Vessel identification began with a roster of vessel names provided by workers during surveys and interviews. Each vessel name was searched in MarineTraffic and VesselFinder databases. To confirm a match, vessels had to align on at least two key characteristics: flag state and gear type.

In cases in which an exact match was not found, the team treated the discrepancy as a potential spelling or translation error and conducted targeted online searches for plausible alternatives. This was particularly important given that vessel names often appear in multiple languages and transliteration systems, especially for Chinese and other Asian vessel names. The Supply Chain Specialist verified whether vessel renaming or reflagging could explain naming discrepancies. Proposed name corrections or aliases were recorded separately to preserve the original worker-provided name.

To manage research resources efficiently, screening time was capped at 30 minutes per vessel name. If a vessel's identity remained ambiguous after these verification steps, it was excluded from the dataset.

Final confirmation of a vessel's identity required alignment between the worker-provided name and the combination of flag state, gear type, and target species. Once confirmed, the team extracted the vessel's Maritime Mobile Service Identity (MMSI), call sign, and International Maritime Organization (IMO) number from MarineTraffic for use in tracking vessel movements.

Port Identification and Vessel Tracking

To identify where vessels landed catch or docked for resupply, the team used GFW as the primary tracking tool. Using the MMSI and IMO identifiers obtained during vessel confirmation, the team uploaded vessel data to GFW's vessel map tool and exported records of all port visits. MarineTraffic was consulted only to provide additional context or verification.

The analysis focused on substantive port calls—defined as visits lasting more than 24 hours—within the study's time period. Port names and classifications (such as distinguishing between anchorages and berths) were reported using GFW's standard terminology without additional interpretation.

Vessels were excluded from port analysis under two conditions. First, vessels making frequent returns to port—operationalized as trip durations shorter than two weeks between consecutive port visits—were excluded as inconsistent with the DWF operational profile, which typically involves extended periods at sea. Second, vessels lacking sufficient AIS data to reliably identify port events were excluded.

Transshipment Events

Transshipment—the transfer of catch between vessels at sea—was analyzed separately from port visits. The team identified transshipment encounters from two sources: worker interview accounts and GFW's transshipment detection database. The analysis included only encounters between fishing vessels and refrigerated carrier vessels (reefers), or between two fishing vessels, and only when the encounter lasted longer than five hours.

Named carrier vessels mentioned by workers were subjected to the same vessel identification process as fishing vessels. However, transshipment encounters detected by GFW that were not mentioned in worker interviews were not counted toward port visit tallies, as they do not involve actual port calls. When GFW and MarineTraffic provided conflicting information about a vessel visit, the team prioritized GFW's classification, using MarineTraffic only for contextual information.

APPENDIX 3: HS CODES: CASE STUDY CATCH

Product	HS code	HS definition
Squid		
Squid* (live, fresh or chilled)	0307.42	Mollusks, whether in shell or not, live, fresh, chilled, frozen, dried, salted or in brine; smoked mollusks, whether in shell or not, whether or not cooked before or during the smoking pro. Cuttlefish and squid: Live, fresh or chilled
Squid (frozen)	0307.43	Cuttlefish and squid: frozen
Squid (other)	0307.49	Cuttlefish and squid: other
Prepared squid* (prepared, preserved)	1605.54	Crustaceans, molluscs and other aquatic invertebrates, prepared or preserved. Cuttlefish and squid
Skipjack tuna		
Skipjack tuna* (fresh or chilled)	0302.33	Skipjack or stripe-bellied bonito
Skipjack tuna* (frozen)	0303.43	Skipjack or stripe-bellied bonito
Skipjack tuna* (filets)	0304.87	Fish fillets and other fish meat (whether or not minced), fresh, chilled or frozen. Frozen filets. Tunas (of the genus Thunnus), skipjack tuna (stripe-bellied bonito) (Katsuwonus pelamis)
Canned tuna	1604.14	Prepared or preserved fish; caviar and caviar substitutes prepared from fish eggs. Fish whole or in pieces but not minced. Tunas, skipjack and bonito (Sarda spp.)
Mackerel		
Mackerel (fresh or chilled)	0302.44	Mackerel (Scomber scombrus, Scomber australasicus, Scomber japonicus)
Mackerel (frozen)	0303.54	Mackerel (Scomber scombrus, Scomber australasicus, Scomber japonicus)
Mackerel* (dried, salted, smoked)	0305.54	Fish, dried, salted or in brine; smoked fish, whether or not cooked before or during the smoking process. Herrings (Clupea harengus, Clupea pallasii), anchovies (Engraulis spp.), sardines (Sardina pilchardus, Sardinops spp.), sardinella (Sardinella spp.), brisling or sprats (Sprattus sprattus), mackerel (Scomber scombrus, Scomber australasicus, Scomber japonicus), Indian mackerels (Rastrelliger spp.), seerfishes (Scomberomorus spp.), jack and horse mackerel (Trachurus spp.), jacks, crevalles (Caranx spp.), cobia (Rachycentron canadum), silver pomfrets (Pampus spp.), Pacific saury (Cololabis saira), scads (Decapterus spp.), capelin (Mallotus villosus), swordfish (Xiphias gladius), Kawakawa (Euthynnus affinis), bonitos (Sarda spp.), marlins, sailfishes, spearfish (Istiophoridae)
Mackerel (prepared, preserved)	1604.15	Prepared or preserved fish; caviar and caviar substitutes prepared from fish eggs. Fish whole or in pieces but not minced. Mackerel

** 6-digit HS classification is overly broad and includes other types of fish per HS description.*

APPENDIX 4: INTERNATIONAL AND DOMESTIC LEGAL FRAMEWORKS RELEVANT TO DISTANT WATER FISHING

Foreign fishing crews working on distant water vessels face a regulatory void created by overlapping maritime jurisdictions and significant gaps between statutory protections and enforcement reality, despite domestic labor laws in China, Indonesia, and Taiwan containing provisions relevant to most ILO forced labor indicators discussed in this report.

International instruments establish important principles, but limited ratification by major fishing nations and weak implementation undermine their effectiveness. The predominance of flag state jurisdiction, combined with flags of convenience, creates a regulatory race to the bottom. Recruitment abuses fall primarily under sending state law, but enforcement mechanisms remain inadequate. Port state inspection authority, including the power to investigate conditions that occurred prior to port arrival, represents a critical enforcement mechanism, though its potential remains largely unrealized in the fishing sector. Transshipment and unlading operations face minimal legal obligation to verify labor conditions, though emerging import restrictions in consumer markets may gradually change this calculus.

INTERNATIONAL LEGAL FRAMEWORKS RELEVANT TO DWF

Maritime labor law in the DWF sector is characterized by fragmented authority, overlapping jurisdictions, and systematic enforcement gaps.

Applicable International Instruments

The international legal architecture governing fishing labor rests on multiple overlapping instruments that fail to provide comprehensive coverage.

ILO Work in Fishing Convention (C188), 2007:[22] This convention provides comprehensive labor standards specific to fishing, including minimum age requirements, medical examinations, crew lists, employment contracts, accommodation standards, and social security protections. However, C188 has achieved limited ratification, with only 24 countries having ratified it as of December 2025.[23] Critically, major DWF nations, including China, Taiwan, South Korea, Japan, and Indonesia, have not ratified the convention. Among ratifiers, few are significant DWF operators, and Thailand remains the only Asian nation to ratify (2019).[24]

ILO Forced Labor Convention (C29), 1930,[25] **and Protocol of 2014:**[26] These instruments prohibit forced labor and require states to take effective measures for its prevention and elimination. These have near-universal ratification, including by major DWF nations. However, enforcement in the fishing sector remains weak, and the instruments lack sector-specific implementation guidance.

ILO Maritime Labor Convention (MLC), 2006:[27] This comprehensive convention covers working conditions on ships. However, it explicitly excludes all vessels "engaged in fishing or in similar pursuits"[28] from its scope. This exclusion recognizes that fishing's unique operational characteristics—irregular hours, catch-dependent remuneration, vessel diversity—require separate treatment, but it leaves fishing crew without MLC's robust flag state enforcement mechanisms.

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[22] https://normlex.ilo.org/dyn/nrmlx_en/f?p=NORMLEXPUB:12100:0::NO::P12100_INSTRUMENT_ID:312333
[23] https://normlex.ilo.org/dyn/nrmlx_en/f?p=1000:11300:0::no:11300:p11300_instrument_id:312333
[24] South Africa, Morocco, and Namibia represent notable exceptions as countries with substantial fishing industries.
[25] https://normlex.ilo.org/dyn/nrmlx_en/f?p=NORMLEXPUB:12100:0::NO::P12100_INSTRUMENT_ID:312174
[26] https://www.ohchr.org/en/instruments-mechanisms/instruments/protocol-2014-forced-labor-convention-1930
[27] https://www.ilo.org/international-labor-standards/maritime-labor-convention-2006
[28] https://normlex.ilo.org/dyn/nrmlx_en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C186

UN Convention on the Law of the Sea (UNCLOS), 1982:[29] UNCLOS establishes the framework for maritime jurisdiction, and establishes flag state duties to "assume jurisdiction under its internal law over each ship flying its flag and its master, officers and crew in respect of administrative, technical and social matters" and to ensure "the manning of ships, labor conditions and the training of crews."[30] However, enforcement depends entirely on flag states' willingness and capacity to enforce its provisions.

Food and Agriculture Organization of the United Nations Port State Measures Agreement, 2016:[31] This agreement strengthens port state authority to prevent illegal fishing but does not explicitly address labor conditions.[32] However, some states have begun using PSMA inspections as opportunities to identify labor violations.

The Protocol to Prevent, Suppress and Punish Trafficking in Persons (Palermo Protocol), 2000:[33] This protocol provides the international definition of human trafficking[34] and obligates states to criminalize human trafficking, including labor trafficking. Major fishing nations, including China, Indonesia, Taiwan, Thailand, and the Philippines, are parties, though implementation in the fishing sector varies dramatically. Taiwan's exclusion from United Nations membership means it cannot formally accede to any United Nations treaties,[35] although it has incorporated Palermo definitions into domestic law through the *Human Trafficking Prevention Act (2023)*.[36]

Overlapping and Concurrent Jurisdictional Authority

The governance of labor conditions on DWF vessels involves multiple, often concurrent legal frameworks that create significant opportunities for regulatory arbitrage and enforcement evasion. A single DWF vessel may simultaneously fall under the nominal authority of its flag state, operate within another country's EEZ under coastal state fisheries agreements, employ workers from multiple sending countries, and dock at ports in yet another jurisdiction.[37]

Flag state jurisdiction remains the primary regulatory authority under international maritime law. Under general maritime law principles, the law of the flag state governs working conditions aboard vessels on the high seas, meaning that a Chinese-flagged vessel employs workers under Chinese labor law, regardless of the workers' nationality or the vessel's operating location. As discussed above, UNCLOS Article 94 establishes flag state duties to "assume jurisdiction under its internal law over each ship flying its flag and its master, officers and crew in respect of administrative, technical and social matters" and to ensure "the manning of ships, labor conditions and the training of crews."[38] However, the prevalence of flags of convenience—in which vessels register in countries with minimal regulatory

[29] https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf
[30] https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf
[31] https://www.fao.org/port-state-measures/en/
[32] Notably, however, the "Guidelines for the training of inspectors" included in the PSMA's Annex E do state that "Elements of a training programme for port State inspectors should include at least the following areas: […] health, safety and security issues … Analysis of information, such as logbooks, electronic documentation and vessel history […] [and] Vessel boarding and inspection, including hold inspections and calculation of vessel hold volumes."
https://openknowledge.fao.org/server/api/core/bitstreams/515b81dc-ad65-41c9-ab02-6ff08103cc3/content
[33] https://www.ohchr.org/en/instruments-mechanisms/instruments/protocol-prevent-suppress-and-punish-trafficking-persons
[34] This definition includes three required elements: an act (recruitment, transportation, harboring); a means (force, deception, abuse of vulnerability, debt bondage); and a purpose (exploitation including forced labor).
[35] https://usali.org/publications/talking-points-what-does-the-united-nations-say-about-taiwan
[36] https://www.law.cornell.edu/gender-justice/resource/%E4%BA%BA%E5%8F%A3%E8%B2%A9%E9%81%8B%E9%98%B2%E5%88%B6%E6%B3%95_human_trafficking_prevention_act
[37] https://doi.org/10.1016/j.marpol.2023.105934
[38] https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf

oversight—significantly undermines this framework's effectiveness, as many DWF vessels register specifically to avoid more stringent labor regulations.[39]

Port state jurisdiction allows countries to inspect[40] foreign vessels entering their ports and enforce certain labor and safety standards under both customary international law and various international conventions.[41] When vessels enter port, the port state may enforce its own labor laws or international conventions to which it is party, regardless of the vessel's flag.[42] This authority provides an important enforcement mechanism but depends on port state capacity and willingness to act.

Coastal state jurisdiction applies when vessels operate within a country's EEZ. When vessels operate under bilateral or multilateral fishing access agreements, coastal state law may impose certain conditions.[43] However, enforcement of labor standards in these contexts remains rare and typically limited to fisheries violations rather than working conditions. These agreements rarely include enforceable labor standards, focusing instead on catch limits, observer requirements, and fishing techniques.

Sending state jurisdiction theoretically governs recruitment practices and may extend protection to nationals working abroad. Recruitment occurs primarily under sending state jurisdiction, as recruitment agencies typically operate on land within the sending country before workers board vessels. Countries like Indonesia, the Philippines, and China maintain laws regulating overseas worker recruitment, including licensing requirements for recruitment agencies, prohibitions or caps on recruitment fees, and mandatory contract provisions.[44] However, enforcement of these protections for fishing workers is notoriously weak due to several factors:

- **Extraterritorial application challenges:** Even when sending states have strong recruitment laws, enforcement becomes difficult once workers leave the country. Investigating violations that occurred during recruitment requires cooperation from workers who may still be at sea, fear retaliation, or lack access to communication.
- **Transnational recruitment networks:** Modern fishing recruitment often involves agencies in multiple countries, with workers recruited in one country, processed through intermediaries in another, and deployed on vessels flagged in a third. This structure complicates determining which country's laws apply and which state bears enforcement responsibility.
- **Limited authority over vessel operations:** Even when sending states identify recruitment violations, they typically lack authority to inspect vessels or enforce remedies once workers are at sea. This temporal and spatial disjuncture enables exploitative recruitment practices to flourish with minimal accountability.
- **Passive personality principle (limited application):** Some sending countries assert jurisdiction over crimes committed against their nationals abroad, potentially including severe labor violations.[45] However, this principle's application to civil labor violations aboard foreign vessels remains largely theoretical and rarely invoked in practice.

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[39] https://www.federalregister.gov/documents/2025/05/22/2025-09236/investigation-into-flags-of-convenience-and-unfavorable-conditions-created-by-certain-flagging

[40] It is important to distinguish here between *investigation* authority and *enforcement* authority. While port states certainly possess *investigation* authority over commercial ships located in any port or internal waters within their territory under both customary international law and various international treaties, their *enforcement* authority may be more nuanced, depending on where violations occurred (within territorial waters, in EEZ, or on high seas).

[41] https://opil.ouplaw.com/display/10.1093/law:epil/9780199231690/law-9780199231690-e2052

[42] https://www.noaa.gov/jurisdiction-over-vessels

[43] https://opil.ouplaw.com/display/10.1093/law:epil/9780199231690/law-9780199231690-e1195#:~:text=11%20Coastal%20States%20are%20entitled,rules%20or%20standards'%20(Art.

[44] https://link.springer.com/chapter/10.1007/978-981-97-9715-8_19

[45] https://academic.oup.com/book/41841/chapter/354633189

Due diligence obligations for transshipment and unlading entities represent an evolving area of law with significant gaps. No specific international convention currently requires transshipment vessels or unlading facilities to conduct forced labor due diligence. The PSMA focuses on IUU fishing verification rather than labor conditions, and ILO conventions address state obligations but do not create direct private sector due diligence requirements.

However, emerging domestic import restrictions are creating practical incentives for due diligence:

- **United States:** The *Uyghur Forced Labor Prevention Act* and *Tariff Act Section 1307* provisions prohibit importing goods made with forced labor. CBP has increasingly detained seafood shipments suspected of forced labor involvement, creating practical due diligence pressure on importers.
- **EU:** The proposed regulation on prohibiting products made with forced labor would require companies to ensure that their supply chains are free from forced labor, though specific implementation details remain under development.
- **Corporate due diligence legislation:** The EU Corporate Sustainability Due Diligence Directive[46] and Germany's Supply Chain Due Diligence Act[47] impose supply chain human rights obligations on larger companies, while various modern slavery acts in the United Kingdom,[48] Australia,[49] and elsewhere require transparency reporting but generally lack enforcement mechanisms.

Practical limitations remain substantial. Transshipped catch is co-mingled from multiple vessels, traceability systems remain rudimentary, and documentation is easily falsified. Port facilities receiving catch typically have no direct relationship with vessel operators and limited means to verify working conditions at sea. While some industry initiatives and certification schemes attempt to establish voluntary standards, and technology solutions including vessel tracking and blockchain-based traceability show promise, these remain limited in scope and adoption.

Enforcement Gaps: The Abdication of Legitimate Jurisdictional Authority

Although labor conditions on DWF vessels could legitimately fall within the investigatory and even enforcement jurisdiction of multiple states, most states have opted not to dedicate the enforcement resources, political capital, or institutional capacity that such enforcement would require. This collective failure to exercise existing authority, rather than absence of legal authority itself, creates the major enforcement gaps that enable widespread labor exploitation in DWF.[50]

Flag states decline at-sea inspection despite clear responsibility. Flag states bear primary responsibility under UNCLOS Article 94 for labor conditions aboard their vessels, yet they rarely conduct at-sea inspections of their DWF fleets. China operates the world's largest DWF fleet of approximately 2,600 vessels but maintains minimal labor inspection capacity for vessels operating in international waters or foreign EEZs. This is not a question of legal authority—flag states possess clear jurisdiction—but rather a political choice not to invest in offshore enforcement infrastructure or risk disrupting economically valuable fishing operations.

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[46] https://eur-lex.europa.eu/eli/dir/2024/1760/oj/eng
[47] https://www.bmz.de/resource/blob/154774/lieferkettengesetz-faktenpapier-partnerlaender-eng-bf.pdf
[48] https://www.legislation.gov.uk/ukpga/2015/30/contents
[49] https://www.legislation.gov.au/C2018A00153/latest/text
[50] This state of affairs was recognized over 20 years ago by the drafters of the Food and Agriculture Organization of the United Nations' 2001 International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing. See https://openknowledge.fao.org/server/api/core/bitstreams/a80c3bfb-1d5b-4ee6-9c85-54b7e83986a2/content ("Regrettably, international instruments to combat IUU fishing have been ineffective due to a lack of political will, priority, capacity, and resources to ratify or accede to and implement them").

Port states possess inspection authority but apply it selectively. When DWF vessels enter port, the port state possesses clear authority to inspect for labor violations under both customary international law and conventions to which it is party. The PSMA provides explicit mechanisms for port state inspection, and most major fishing ports maintain inspection regimes. However, these inspections focus almost exclusively on fisheries documentation and catch verification, rather than labor conditions. Port state inspectors typically lack training to identify forced labor indicators, and port states often lack political will to investigate labor violations aboard vessels flagged to important trading partners or fishing access agreement partners. This represents a deliberate allocation of limited inspection resources toward fisheries compliance rather than human rights enforcement.

Sending states fail to enforce existing recruitment protections. Countries like Indonesia, the Philippines, and China maintain comprehensive legal frameworks regulating overseas worker recruitment, including licensing requirements for agencies, prohibitions on excessive recruitment fees, and mandatory contract provisions. These laws apply clearly to fishing worker recruitment occurring within their territory. However, enforcement mechanisms for the fishing sector lag far behind those for domestic workers or workers in other overseas sectors. Recruitment agencies frequently operate with impunity, charging illegal fees and falsifying documents, not because sending states lack legal authority to prosecute but because they allocate insufficient labor inspectors to the fishing sector, fear damaging relationships with receiving countries that provide employment opportunities, or lack political pressure to prioritize fishing workers' rights. Workers have limited practical recourse when violations occur before departure because complaint mechanisms remain under-resourced, and fear of blacklisting discourages reporting.

Coastal states rarely exercise their EEZ enforcement authority. When DWF vessels operate within coastal state EEZs under fishing access agreements, the coastal state possesses jurisdiction to impose labor conditions as part of access requirements. However, enforcement of labor standards in these contexts remains exceedingly rare, typically limited to fisheries violations rather than working conditions. Coastal states, particularly developing nations that depend on fishing access fees as significant revenue sources, are reluctant to jeopardize bilateral fishing agreements by investigating labor violations aboard foreign vessels. The economic incentives favor maintaining access agreements over enforcing labor protections for foreign crews.

Private sector faces minimal accountability pressure compared to other industries. Unlike land-based supply chains, in which corporate buyers face increasing legal obligations and reputational pressure to ensure ethical sourcing, fishing supply chains operate with minimal private sector accountability.[51] Multiple layers of intermediaries (transshipment vessels, processors, distributors) obscure the vessel origin of products, and major seafood buyers have successfully resisted mandatory due diligence requirements.[52] Several jurisdictions have enacted corporate due diligence legislation and forced labor import bans, but enforcement remains limited. The United States has issued only one forced labor finding against a fishing vessel (the Da Wang in 2022[53]), despite widespread documentation of forced labor indicators throughout DWF fleets. This enforcement gap exists not because legal authority is absent—customs authorities possess clear statutory authority to detain shipments—but because investigating complex fishing supply chains requires substantial resources, and political will to disrupt seafood imports from major trading partners remains limited.[54]

Jurisdictional overlap in transshipment operations provides legal cover for inaction. Modern DWF operations frequently involve vessels of different nationalities working in coordination; for

[51] https://doi.org/10.1016/j.marpol.2020.103833
[52] https://www.globalseafood.org/advocate/how-can-the-fishing-industry-address-forced-labor-now-that-the-scope-is-more-in-focus/
[53] https://ejfoundation.org/news-media/taiwan-and-chinese-fishing-fleets-added-to-us-forced-labor-list
[54] https://financialtransparency.org/wp-content/uploads/2023/11/FTC_2023-Report_Dark-webs_EN.pdf

example, Chinese fishing vessels transshipping catch to reefer vessels flagged elsewhere, which then unload in third-country ports for processing in a fourth country before export to final consumer markets. Each state involved (flag states of fishing and transshipment vessels, port states, processing country, importing country) possesses some enforcement authority, whether over their flagged vessels, port activities, import restrictions, or corporate due diligence obligations. Yet this jurisdictional overlap often becomes legal cover for collective inaction, with each state pointing to other states' theoretical responsibility rather than exercising its own legitimate authority. The result is that no state takes enforcement action, and accountability vanishes in the complexity.

The enforcement vacuum in DWF labor protection thus stems not from jurisdictional uncertainty or absence of legal authority, but from systematic political choices by states at every point in the supply chain not to exercise the enforcement authority they possess. Flag states, port states, sending states, coastal states, and market states all maintain legal frameworks that could address forced labor in fishing, yet none dedicates sufficient resources or political capital to enforcement.

DOMESTIC LEGAL PROTECTIONS RELEVANT TO DWF

China, Taiwan, and Indonesia maintain domestic labor laws that nominally prohibit most practices associated with forced labor in fishing operations, including the following practices discussed in this report: security deposits, debt bondage, hazardous conditions, wage manipulation, restriction of movement, document retention, coercion, and contractual abuse.

Chinese law under the Labor Contract Law Articles 9 and 84 explicitly prohibits security deposits and document retention. Indonesian law under Law No. 21 of 2007 on Trafficking criminalizes debt bondage with penalties of up to 15 years imprisonment. Taiwan's Human Trafficking Prevention and Control Act prohibits document confiscation with criminal penalties up to one year. However, a fundamental enforcement gap exists across all jurisdictions: none have ratified ILO Convention 188 (Work in Fishing), the principal international instrument governing fishing labor, and documented investigations consistently find high rates of forced labor indicators despite comprehensive legal prohibitions on paper.

Chinese Law Prohibits Forced Labor Indicators but Faces Enforcement Void at Sea

China's domestic labor framework provides comprehensive statutory protections against practices that would constitute various forced labor indicators, but these laws were designed for land-based employment and face fundamental jurisdictional limitations when applied to vessels operating in international waters or foreign EEZs.

Labor Contract Law (2008) provides the primary legal framework.[55]

- **Article 9** establishes a prohibition on security deposits and document retention: "When recruiting a worker, the employing unit may not detain the worker's resident identity card or other certificates, nor may it require him to provide guaranty or collect money or things of value from him in other names."[56]
- **Article 84** provides that individuals or companies found to have detained a worker's identity card or other certificates, or to have charged a security deposit or guarantee fee, will be ordered to return the documents or deposit and be subjected to a fine of 500–2000 yuan (USD 74-294).

[55] https://www.warnathgroup.com/wp-content/uploads/2015/03/Indonesia-TIP-Law-2007.pdf
[56] http://www.npc.gov.cn/zgrdw/englishnpc/Law/2009-02/20/content_1471106.htm

The **Employment Promotion Law (2007)** extends these and other prohibitions to employment agencies.[57]

- **Article 41** prohibits employment agencies from "holding workers' resident identification cards and other credentials or collecting deposits from workers" and "charg[ing] a deposit against the laborers," but also prohibits them from "provid[ing] false employment information."

For hazardous conditions, the **Work Safety Law Article 28** (2021 revision) mandates that "employees failing the work safety education and training shall not take their posts."[58] **Labor Contract Law Article 32** further protects workers' right to refuse dangerous operations without breach of contract.

Wage protections appear robust on paper. **Article 30** requires employers to pay remuneration "on time and in full," and **Article 85** imposes penalties of **50–100% additional compensation** for wage violations, including failing to pay on time, paying below minimum wage, denying overtime pay, or failing to pay termination compensation.[59]

Criminal Law Article 244 directly criminalizes forced labor through movement restriction: "Whoever forces another to work by violence, threat, or restriction of personal freedom shall be sentenced to fixed-term imprisonment of not more than three years or criminal detention."[60] Aggravated circumstances increase the penalty to **3–10 years' imprisonment**. The same article covers those who "recruit or transport another for the purpose of forcing him to labor."

Labor Contract Law Article 38 grants workers immediate termination rights without notice "if an employing unit forces a person to work by resorting to violence, intimidation or illegal restriction of personal freedom."[61]

Despite these protections, advocacy groups and civil society organizations routinely reveal systemic violations on Chinese distant water vessels.[62] The fundamental enforcement gap stems from jurisdictional limitations: Chinese labor laws apply "within the territory of the People's Republic of China," leaving foreign crew on vessels in international waters or foreign EEZs without effective access to Chinese labor dispute mechanisms.

U.S. government findings and enforcement actions underscore elevated forced labor risk associated with Chinese DWF and seafood supply chains. The U.S. Department of Labor's *List of Goods Produced by Child Labor or Forced Labor* includes fish from China. CBP has also issued Withhold Release Orders targeting seafood harvested using forced labor by specific Chinese-flagged vessels, including a Withhold Release Order on the vessel *Zhen Fa 7* (May 28, 2025). Separately, the U.S. Department of the Treasury's Office of Foreign Assets Control has used Global Magnitsky sanctions authorities to designate China-based DWF actors for serious human rights abuse aboard DWF vessels (December 9, 2022). Finally, the National Oceanic and Atmospheric Administration's *2023 Report to Congress on Improving International Fisheries Management* identified the People's Republic of China for IUU fishing, and that identification includes information related to seafood-related goods produced through forced labor—highlighting how labor abuses can intersect with fisheries compliance risks in DWF operations.

[57] https://natlex.ilo.org/dyn/natlex2/natlex2/files/download/76984/76984.pdf
[58] https://hrone.com/blog/work-safety-law-china/
[59] http://www.npc.gov.cn/zgrdw/englishnpc/Law/2009-02/20/content_1471106.htm
[60] https://www.registrationchina.com/articles/law/labor-contract-law-of-china/
[61] http://www.npc.gov.cn/zgrdw/englishnpc/Law/2009-02/20/content_1471106.htm
[62] See, e.g., https://ejfoundation.org/news-media/global-impact-of-illegal-fishing-and-human-rights-abuse-in-chinas-vast-distant-water-fleet-revealed; https://ejfoundation.org/news-media/four-crew-from-chinese-fishing-vessel-die-without-medical-care

Indonesian Law Provides Strong Statutory Framework with Fishing Sector Exemptions

Indonesia occupies a unique position as both a flag state with the world's second largest capture fishery[63] and among the largest sending countries for migrant fishers globally.[64]

Indonesia has incorporated most international forced labor prohibitions into domestic law, but the fishing sector operates under a distinct regulatory regime that provides weaker protections than general labor law, particularly through the *bagi hasil* (profit sharing) wage system that effectively exempts fishing from minimum wage requirements.[65]

Law No. 21 of 2007 on Eradication of the Criminal Act of Trafficking in Persons provides the primary legal framework.[66]

- **Article 1(1)** explicitly includes prohibited means relevant to fishing: violence, threats, incarceration/confinement, fraud, deception, and abuse of a position of vulnerability.
- **Article 1(11)** defines violence as "any unlawful act... against the physical and psychological aspect of a person that threatens the life or body, or causes the deprivation of such person's freedom."
- **Article 1(15)** defines debt bondage as "the act of placing a person in a situation or condition where such person places or is forced to place him/herself or his/her family […] as a form of repayment of the debt."
- **Article 2** establishes penalties of **3–15 years' imprisonment** and fines of **Rp 120–600 million** (~USD $7,800–$39,000) for trafficking offenses; causing victim death increases the penalty to 5 years to life imprisonment.

Law No. 18 of 2017 on Protection of Indonesian Migrant Workers addresses recruitment fees.[67]

- **Article 30(1)** states that Indonesian migrant workers shall not be responsible for paying recruitment fees or "placement costs"[68]—a prohibition implemented through **BP2MI Regulation No. 9/2020**, which designates informal sector workers including fishing crew as particularly vulnerable.[69] Under the 2017 law and 2020 regulation, recruitment fees or "placement costs" include but are not limited to: flight tickets, work visas, legalization of working agreements, training and skill competency certification, medical check-ups and other administrative requirements, transportation, accommodation, and service fees.
- **Article 86** establishes that individuals found to have charged Indonesian migrant workers for placement costs may be subject to criminal penalties, including imprisonment up to 5 years for unlawful placement practices and a maximum fine of Rp15 billion (USD 863,192). However, ILO reports indicate that many recruitment agencies still charge substantial fees to migrant fishing crew despite this prohibition.[70]

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[63] https://doi.org/10.1016/j.aaf.2024.08.002
[64] https://indonesia.iom.int/news/addressing-forced-labor-and-trafficking-persons-fisheries-sector
[65] https://www.ilo.org/media/481076/download
[66] https://www.warnathgroup.com/wp-content/uploads/2015/03/Indonesia-TIP-Law-2007.pdf
[67] https://asean.org/wp-content/uploads/2016/05/Law-of-Indonesia-No-18-of-2017-on-Protection-of-Indonesian-Migrant-Workers.pdf
[68] Original text: "PMI tidak dapat dibebani biaya penempatan"
[69] Regulation of the Head of the Indonesian Migrant Workers Protection Agency No. 9 of 2020 (Perka BP2MI 9/2020) abolishes recruitment fees for Indonesian migrant workers. Issued under the mandate of Law No. 18 of 2017 concerning the Protection of Indonesian Migrant Workers, this regulation prohibits charging workers for migration-related placement costs. It defines "recruitment fee" broadly to include expenses for recruitment, placement requirements, and necessary support costs in destination countries. Specific prohibited charges cover flight tickets, work visas, contract legalization, training, medical check-ups, transportation, accommodation, and service fees.
[70] https://www.tandfonline.com/doi/full/10.1080/23311886.2024.2421347; https://www.ilo.org/media/394001/download

The **Constitution (UUD 1945) Article 28I(1)** provides foundational protection: "The rights to life, freedom from torture […] freedom from enslavement, recognition as a person before the law […] are all human rights that cannot be limited under any circumstances."[71]

Law No. 13 of 2003 on Manpower[72] establishes occupational safety requirements. **Articles 86–87** mandate employer provision of occupational safety and health protections and implementation of safety management systems.[73] **Articles 88–98** establish minimum wage requirements at provincial level.

However, **MMAF Regulation No. 33/2021 (PERMEN KP 33/2021)**[74] creates the critical fishing exemption through **Article 176**, which permits fishing vessel crew remuneration through either monthly salary or **profit-sharing (*bagi hasil*)** systems. **Article 176(2)** provides minimal protection: "In conditions that result in no net income, the owner or operator of a fishing vessel must pay all fishing vessel crews half of the provincial minimum wage." Research by Destructive Fishing Watch Indonesia found average monthly wages for fishing boat crews of **Rp 900,000–1.3 million (USD 52-75)**, well below Jakarta's minimum wage of Rp 4.6–5 million (USD 264-288), with 47% paid less than Rp 2 million (USD 115) monthly.[75]

Government Regulation No. 22/2022 establishes work agreement requirements for migrant fishing crew, but a 2020 ILO report notes that it only covers migrant fishers, creating a protection gap for domestic fishing crew.[76]

Taiwan's Dual-Track System Creates Discriminatory Two-Tiered Protections

Taiwan's regulatory framework for DWF distinguishes between "domestically hired" (境內聘僱) and "overseas-hired" (境外聘僱) foreign crew, a distinction that many critics argue facilitates forced labor.[77] Overseas-hired crew, comprising the majority of Taiwan's approximately 19,000 foreign fishing workers,[78] are explicitly excluded from the Labor Standards Act and subject only to Fisheries Agency regulations with significantly weaker protections.

The Ministry of Labor explicitly justifies this exclusion by stating that overseas-employed foreign crew "are not subject to the Labor Standards Act because those crew members are employed overseas, laid off overseas, and returned directly to their home country after the fishing operation is finished."

The **Human Trafficking Prevention Act Article 2(1)**[79] defines trafficking means to include violence, threats, intimidation, confinement, monitoring, withholding important documents, and "improper debt bondage," defined in **Article 2(3)** as "the use of unclear contracts or unreasonable payments of a debt to place people under bondage." **Article 31** criminalizes using such means **to subject persons to labor with penalties of 1–7 years' imprisonment and fines up to NT$5 million (USD 159,269).**

Unlike China and Indonesia, Taiwan permits charging workers recruitment fees. The **Employment Service Act Article 35** authorizes fee collection by employment agencies as prescribed by regulations. The regulation covering the collection of these fees, **Standards for Fee-Charging Items and Amounts of Private Employment Services Institutions**,[80] permits monthly service fees during

[71] https://jdih.bapeten.go.id/unggah/dokumen/peraturan/116-full.pdf
[72] https://www.jurnalp4i.com/index.php/social/article/download/3316/2818
[73] https://enviliance.com/regions/southeast-asia/id/id-osh
[74] https://peraturan.bpk.go.id/Details/190283/permen-kkp-no-33-tahun-2021
[75] https://dfw.or.id/supervise-the-crew-pay-system-on-fishing-vessels/
[76] https://www.ilo.org/media/394001/download
[77] See, e.g., https://www.greenpeace.org/static/planet4-usa-stateless/2024/11/2ce85b93-greenpeace-briefing-to-us-dol_may-5-2020_final.pdf
[78] https://www.mdpi.com/2410-3888/8/2/73
[79] https://law.moj.gov.tw/Eng/LawClass/LawAll.aspx?PCode=D0080177
[80] https://law.moj.gov.tw/ENG/LawClass/LawAll.aspx?pcode=N0090028

employment, a provision that, according to the U.S. Trafficking in Persons Report, "allow[s] brokers to charge unlimited recruitment and service fees, which may be permissive of bonded labor."[81]

The **Passport Act Article 32** criminalizes document retention: "Imprisonment of no more than three years, detention, and/or a fine of no more than NT$300,000 (USD 9,555) may be imposed on those who illegally seize another person's passport or use a passport as collateral for debts or liabilities."[82] The Human Trafficking Prevention Act's 2018 amendments strengthened prohibitions on document retention without consent.

The **Employment Service Act Article 53** severely restricts migrant workers' ability to change employers unless Article 59 exceptions apply (employer death/emigration, vessel detention/sinking, factory closure, or reasons not attributable to the worker).[83] This restriction binds workers to potentially abusive employers.

Taiwan's **2022 Action Plan for Fisheries and Human Rights** introduced 7 strategies, including raising minimum wages, requiring direct payment, implementing CCTV on vessels, attendance records, 10-month maximum time at sea, and adequate provisions.[84] However, CCTV installation remains voluntary, Wi-Fi access is not mandated (isolating workers for months), and non-governmental organizations criticize the plan as failing to address fundamental issues.[85]

The **Act for Distant Water Fisheries Article 42** establishes penalties: unauthorized recruitment agents face fines of NT$4–20 million (USD 127,549-637,745), violations of crew rights trigger fines of NT$1–5 million (USD 31,900-159,500) with possible license suspension, and employing foreign crew without permission incurs fines of NT$50,000–250,000 (USD 1,592-7,910).[86]

Despite these legal frameworks, Taiwan's fish have remained on the U.S. Department of Labor's *List of Goods Produced by Child Labor or Forced Labor* since 2020 (https://edition.cnn.com/2025/07/12/asia/taiwan-fishing-labor-abuse-intl-hnk). The 2022 Da Wang case resulted in the only CBP **formal finding of forced labor** on a fishing vessel, documenting all 11 ILO indicators of forced labor on a Taiwanese-flagged vessel.[87]

Recent trade policy developments may also shape Taiwan's legal and enforcement landscape for labor conditions in the DWF sector. In February 2026, the United States and Taiwan signed the U.S.–Taiwan Agreement on Reciprocal Trade, which includes labor-related commitments relevant to commercial fishing and other sectors, including measures aimed at strengthening labor protections and enforcement (e.g., addressing recruitment-fee practices in certain sectors, prohibiting retention of workers' identity documents, and reinforcing prohibitions on forced labor in supply chains) (United States Trade Representative, 2026). While implementation is expected to be phased and operationalized over the next three to five years, the agreement provides a concrete example of how a market state can use trade negotiations and related compliance mechanisms to incentivize stronger labor standards and accountability in DWF supply chains.

[81] https://www.state.gov/reports/2018-trafficking-in-persons-report/taiwan
[82] https://www.boca.gov.tw/cp-144-471-13088-2.html
[83] https://laws.mol.gov.tw/eng/EngContent.aspx?msgid=68
[84] https://english.ey.gov.tw/News3/9E5540D592A5FECD/89bbc610-49c2-4080-85f9-6d2cb98bee96
[85] https://laborrights.org/publications/comments-concerning-ranking-taiwan-united-states-department-state-2024-trafficking
[86] https://law.moj.gov.tw/ENG/LawClass/LawAll.aspx?pcode=M0050051
[87] https://ejfoundation.org/news-media/taiwan-and-chinese-fishing-fleets-added-to-us-forced-labor-list

ENFORCEMENT DATA REVEAL SYSTEMATIC GAP BETWEEN LAW AND PRACTICE

Quantitative evidence from non-governmental organization investigations and government enforcement reveals the systematic nature of forced labor indicators in DWF, despite comprehensive statutory prohibitions. In a 2022 study, EJF interviewed 116 Indonesian crewmembers on 88 vessels and found that 99% of the surveyed workers had experienced wages deducted or withheld, 97% experienced debt bondage or document confiscation, 58% witnessed or experienced physical violence, and 85% reported abusive working conditions.[88] A 2024 study of fishers working on Chinese tuna longliners in the Southwest Indian Ocean found that 100% of surveyed workers reported abusive conditions, and more than half reported witnessing physical violence.[89] Greenpeace investigations into conditions on over a dozen Taiwanese vessels found conditions meeting each of the 11 ILO indicators of forced labor.[90] And a 2024 ILO survey of 3,396 Indonesian fishers found that more than half reported recruitment processes deviating from national laws, and more than 90% lacked written employment contracts.[91]

CONCLUSION: STRUCTURAL REFORMS NEEDED BEYOND STATUTORY AMENDMENTS

Despite ample jurisdictional grounds under international law on which multiple states could exert investigatory and enforcement authority over labor conditions on DWF vessels, including flag state jurisdiction under UNCLOS Article 94, port state jurisdiction to inspect vessels entering their ports, coastal state jurisdiction over vessels operating in their EEZs, and sending state jurisdiction over recruitment practices and potentially under the passive personality principle for crimes against their nationals abroad, systematic labor exploitation persists throughout the sector. Although certain legal hurdles remain (e.g., the explicit exclusion of fishing vessels from the Maritime Labor Convention, Taiwan's discriminatory dual-track system that excludes overseas-hired crew from Labor Standards Act protections, and Indonesia's profit-sharing exemption from minimum wage requirements), these statutory gaps cannot alone explain the high rates of abusive labor conditions that have been regularly observed on DWF vessels. Rather, the enforcement vacuum stems primarily from lack of governance capacity and political will: flag states decline at-sea inspections of their distant water fleets, port states allocate inspection resources toward fisheries compliance rather than labor conditions, sending states under-resource complaint mechanisms for fishing sector recruitment violations, and market states rarely exercise import detention authority despite documented evidence forced labor. This collective abdication of legitimate jurisdictional authority—rather than absence of legal authority itself—enables labor exploitation to flourish across multiple regulatory boundaries, with workers trapped in a system in which everyone has authority and no one acts.

[88] https://ejfoundation.org/news-media/global-impact-of-illegal-fishing-and-human-rights-abuse-in-chinas-vast-distant-water-fleet-revealed
[89] https://ejfoundation.org/news-media/china-is-responsible-for-systemic-human-rights-abuses-and-illegal-fishing-across-the-southwest-indian-ocean-new-investigation
[90] https://www.greenpeace.org/southeastasia/publication/3428/seabound-the-journey-to-modern-slavery-on-the-high-seas/
[91] https://indonesiabusinesspost.com/3892/society-environment-and-culture/indonesian-fishing-crew-still-vulnerable-to-exploitation-ilo-survey

APPENDIX 5: SUPPLY CHAIN CASE STUDIES

From the study's findings on forced labor risk indicators reported by Indonesian migrant fishers, three illustrative case examples were selected to show how labor risk can connect to distinct supply chain pathways and intervention points.

SUPPLY CHAIN CASE STUDY 1: HONOLULU

Two Hawai'i-based longline vessels, Star[92] and Victorious were identified in fisher interviews conducted for this study as having forced labor. The respondent on one of these vessels reported insufficient food due to provisioning issues, payment delays due to vessel mechanical issues, excessive working hours leading to insufficient sleep, and working with no breaks. The worker could not refuse the excessive work hours because of the risk of being sent home (dismissed). The respondent on the other vessel also reported insufficient food, payment delays due to low catch, rarely being able to access communications (Wi-Fi), and working very long hours under threat of being sent home at his own expense. This worker also worked several months beyond the contract end date because the vessel was out to sea.

Jointly, the AIS and interview data provide a consistent picture of how tuna caught by these Hawai'i-based longliners moves from the high seas to a highly centralized landing and first-sale node in Honolulu, and then into local food culture and U.S. mainland markets.

Fishing

Hawai'i's DWF fleet is a cornerstone of the state's seafood economy, structured around two primary fisheries: a deep-set component targeting bigeye tuna and a shallow-set component focused on swordfish, with yellowfin and other pelagic species also landed. The fleet operates almost entirely from Hawai'i, landing fish fresh and ice-chilled through Honolulu's auction system. Ownership is distributed among many small operators, most owning a single vessel, alongside a few with multiple boats. Vessels such as Star and Victorious typically venture far offshore into high seas fishing grounds—where roughly 70% of the fleet's catch occurs—before returning to Honolulu for sale.

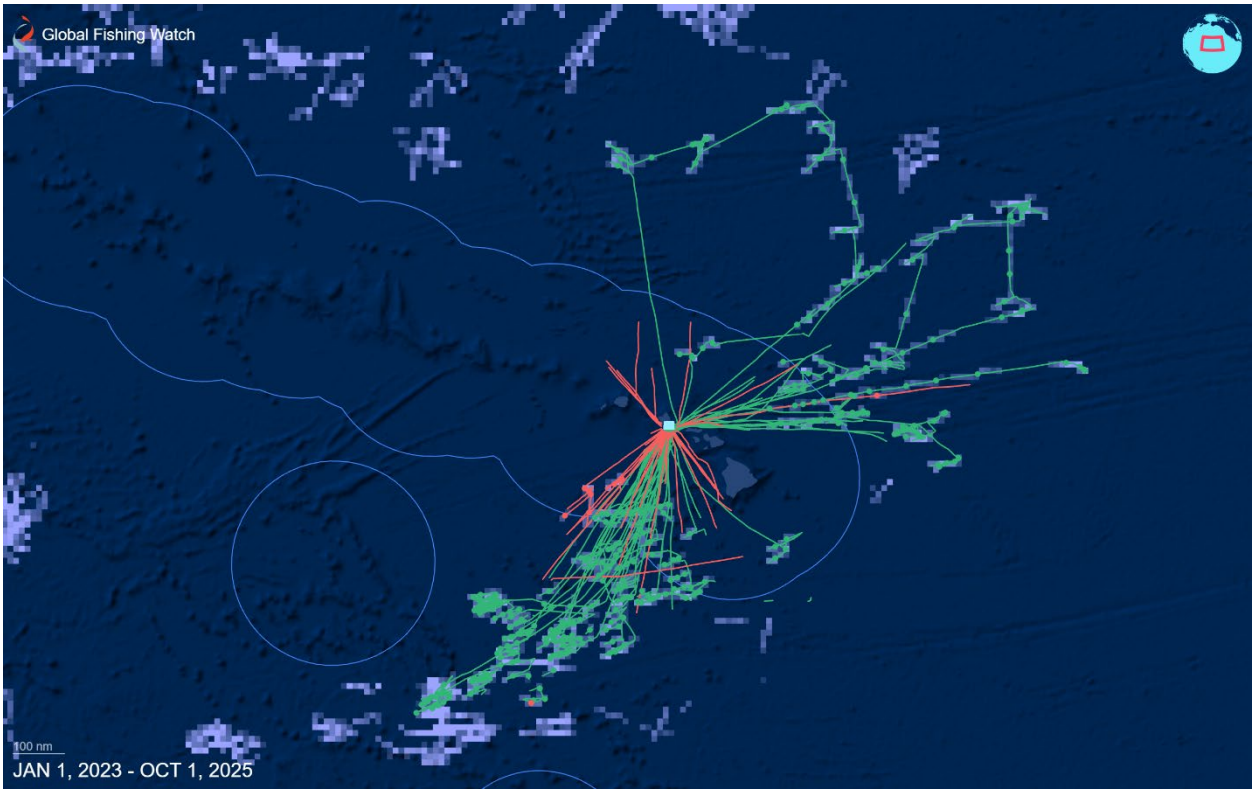
This industry supplies premium seafood to U.S. and international markets (Georgetown Law Human Rights Institute, 2019; Grube, 2021). However, its labor model relies on approximately 700 foreign workers, often from Southeast Asia, employed under restrictive visa arrangements that exclude them from standard U.S. labor protections (Strain, 2016). These structural gaps have created the risk of forced labor, with indicators including confinement aboard vessels, confiscation of identification documents, withheld wages, and limited access to medical or legal support (Georgetown Law Human Rights Institute, 2019; Strain, 2016). Investigations have documented harsh conditions and isolation, with workers unable to leave pier areas or procure basic necessities independently (Georgetown Law Human Rights Institute, 2019). These risks reverberate through the global seafood supply chain, raising ethical concerns for retailers and consumers (Bureau of International Labor Affairs, 2020). Industry responses include codes of conduct, grievance mechanisms, and multilingual crew handbooks, partly prompted by lawsuits involving Indonesian fishermen alleging abuse and denial of medical care (Grube, 2021). Despite reforms, systemic issues persist as immigration restrictions and economic dependency continue to expose migrant workers to exploitation (Bureau of International Labor Affairs, 2020; Strain, 2016).

As shown in Figure A1, AIS data show fishing trips defined by a repetitive rhythm: an approximately three-week period at sea harvesting tuna and associated pelagics, followed by returns to Honolulu to offload. Over the research period, Star had 20 port calls, with a median of 20 days between each. Victorious had 12 port calls, with a median of 22 days between them. This trip cadence is consistent

[92] Vessel names have been changed to protect research participant identities.

with a fresh-chilled supply chain. Because the fish are landed chilled rather than frozen, time at sea is constrained by quality preservation and the need to return regularly for landing and sale.

Figure A1. AIS vessel track of Star and Victorious over the period which interviewed workers were present on board



Source: GFW, 2025

Port

Both Star and Victorious land their catch in Honolulu Harbor at Pier 38, where the Honolulu fresh fish auction serves as the principal "first-sale" gateway for fresh pelagic fish in Hawai'i, and the Hawai'i longline fleet supplies most of the fish sold through the auction (Budiono, 2022; de Sousa, 2022). On landing days, offloading at Pier 38 feeds directly into auction operations that run six days per week. Tuna are landed as ice-chilled fish (not frozen), typically head-on but gilled and gutted at sea to protect quality. Each fish is handled as an individual unit of sale: it is identified, weighed, and prepared for buyer inspection on the auction floor, and fish-level traceability is embedded in the system through barcoding that links each fish back to the originating vessel.

In 2019, Hawai'i sold roughly 34 million pounds of commercial pelagic landings valued at about USD $105 million, with bigeye tuna the top landed species, followed by yellowfin (Dombrow et al., 2022). In Hawai'i, bigeye and yellowfin tuna make up the dominant share of commercial pelagic landings. One National Oceanic and Atmospheric Administration analysis reports that bigeye accounted for roughly 49% of volume and 60% of revenue in 2019, with yellowfin contributing about 17% of volume and 20% of revenue (Dombrow et al., 2022).

For vessels like Star and Victorious, the practical effect is that high seas-caught tuna enters the market through a single, highly structured node rather than dispersing across multiple ports and private dock sales. The auction model is designed to create transparent price formation through competitive bidding, rewarding quality and enabling multiple buyer types (wholesale, retail, and restaurant) to purchase fish

directly, rather than relying on a single wholesaler to set prices. In industry-facing materials, access to the Pier 38 auction is also described as a key point of leverage, as non-compliance by vessel operators can result in loss of access to the daily fish auction operated by the United Fishing Agency.

Processing and Destination Markets

Once tuna is landed in Honolulu, the product pathway is shaped by the species, quality, and demand pull from Hawaiian tourism and resident markets. Processing at this node is generally light and market-facing, rather than large scale. Key informants confirmed that buyers purchase fish through the auction and then sell it onward as whole fish or break it down into loins, fillets, or poke cubes for local retail and foodservice. Importantly, grocery store poke is often made with imported frozen tuna (frequently yellowfin) treated to preserve color, while fresh, locally sourced poke tends to command a premium (Industrial Economics Incorporated, 2023).

Ahi is deeply embedded in local Hawaiian food culture and is commonly eaten raw as sashimi or poke. Consumption of bigeye in Hawai‘i has increased, and 70% of landings are consumed locally (Dombrow et al., 2022). Demand in Hawai‘i is reinforced by the state's role as a premium fresh fish market and by tourism, with demand spiking during the winter holiday season.

Not all of the catch stays in the islands; roughly 18% is air-shipped to the U.S. mainland, and approximately 10% is exported internationally (Dombrow et al., 2022; Industrial Economics & Gomez-Hall Associates, 2023). The yellowfin catch from Star and Victorious could not be directly traced. Seafood from both vessels was most likely consumed as fresh fish in Hawaii or airlifted for consumption to the U.S. mainland.

There are several seafood wholesalers and distributors that operate in Honolulu, Hawai‘i. These wholesalers have not been directly linked to vessels with forced labor conditions on board. However, given the widespread occurrence of forced labor in the DWF tuna supply chain, their operations illustrate how tuna produced wholly or in part with forced labor may enter U.S. grocery retail markets or be exported to destination markets.

Wholesaler #1

A Honolulu-based seafood distributor sells poke meal kits, fresh tuna, and frozen tuna to grocery retailers in the United States. However, each product line includes a country of origin list.

This wholesaler sells fresh tuna in the form of loins for sashimi, poke cuts, steaks and headed and gutted fish. The country of origin listed for this product is the Philippines, Vietnam, the United States (Hawai‘i), Maldives, and Fiji.

The company indicates that the following grocery retailers carry their products:

- Albertsons
- Costco
- Fred Meyer
- The Fresh Market
- Jewel Osco
- Market Choice
- Publix
- QFC
- Ralphs
- Safeway
- Sprouts
- Tops
- US Foods
- WinCo Foods

It is important to note that this study did not link vessels with forced labor to this wholesaler. Also, the retailers listed here apply to all seafood products offered by this company. This includes Atlantic salmon, wild salmon, exotic fish, and skin packs. However, the country of origin disclosures for fresh tuna demonstrate how tuna entering the U.S. market in Hawai‘i may find its way into U.S. grocery retailers supply chains.

Wholesaler #2

A second Honolulu-based processing company distributes fresh and frozen tuna to global seafood markets. The company noted its long history of grading and shipping premium tuna to the Japanese market. The company did not list a country of origin for these products; rather, it referred to the seasonal availability of Hawaii's major fish species, such as albacore, big eye ahi, bluefin, skipjack, and yellowfin tuna. The company also sells billfish, bottomfish, grouper, hamachi, mahi mahi, moonfish, monchong, octopus, ono, snapper, swordfish, and tilapia.

SUPPLY CHAIN CASE STUDY 2: CHINESE-FLAGGED VESSELS AND TRANSSHIPMENT OFF PERU

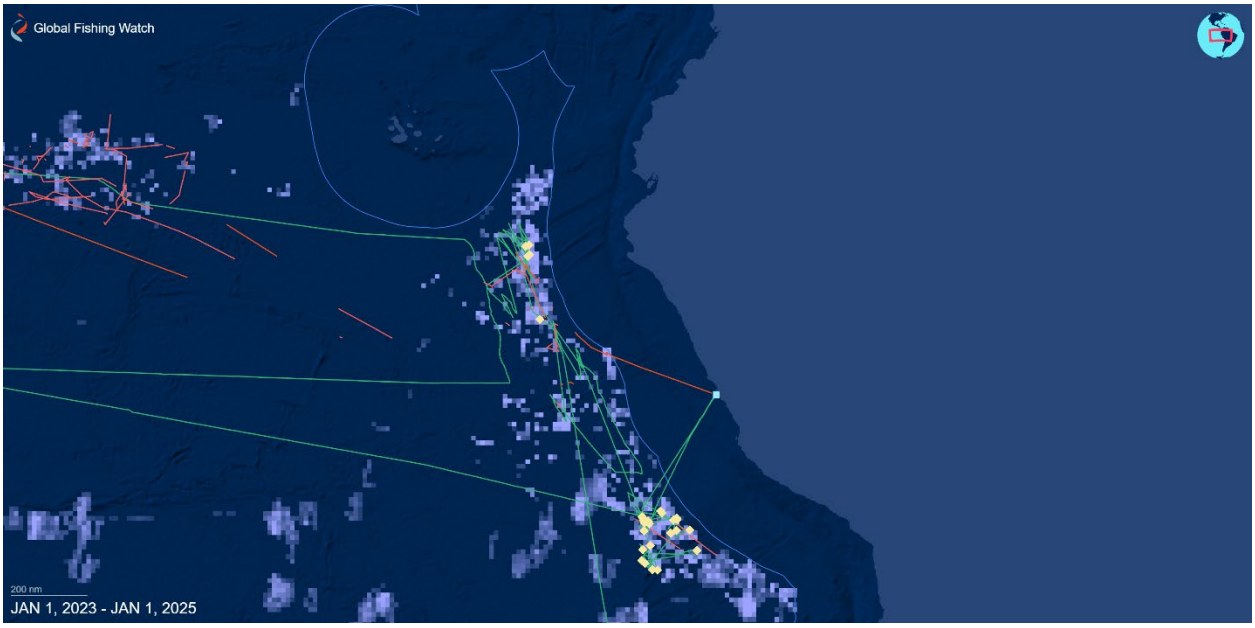
Capture and Transshipment on the High Seas

One Indonesian worker interviewed for this study reported working on the Chinese-flagged squid jigger Prosperous, a distant water vessel targeting jumbo flying squid (*Dosidicus gigas*) on the high seas off Peru and Argentina. The fisher described multiple exploitative conditions, including salary deductions for recruitment fees, lack of clean water when the distillation machine failed, no external communication for six or more months, confiscation of their passport, absence of safety training for hazardous tasks, and inability to resign due to the prohibitive cost of self-funded repatriation.

The vessel operates as part of the large Chinese distant water squid fleet that has, since the early 2000s, fished just outside the Peruvian and Chilean EEZs, following the highly migratory jumbo flying squid stock along the Humboldt Current as well as targeting the two squid species around the Falkland Islands. Smaller vessels operate year-round, while larger vessels equipped with mechanized jiggers concentrate in the region for several months each year when squid availability is highest.

During the worker's contract period (2023 to 2025), AIS data show the Prosperous repeatedly rendezvousing with the Chinese-flagged carrier vessel Sea Dragon on the high seas just outside the Peruvian EEZ. Over roughly a month, the two vessels interacted an estimated five to seven times, consistent with multiple transshipments of frozen squid from the jigger to the carrier (Global Fishing Watch, 2025).

Figure A2. Transshipment encounter between Prosperous and Sea Dragon off the coast of Peru[93]



Source: GFW, 2025

Although it is not possible to determine whether all of the Prosperous's jumbo flying squid catch during this period was transferred to the Sea Dragon, these repeated rendezvous indicate that at least a portion, if not all, of the catch was consolidated on the carrier.

Port Call in Callao, Peru

Following the series of high seas interactions, AIS tracks show the Sea Dragon sailing toward the Peruvian coast and entering the port of Callao, Peru's principal commercial fishing port and one of the SPRFMO-authorized ports for foreign jumbo squid vessels.

Port state and customs records accessed through *Superintendencia Nacional de Aduanas de Administracion Tributaria* (SUNAT) confirm this call but show no registered discharge of cargo. In the Sea Dragon's arrival manifest, customs list a large consignment of frozen squid, packed in approximately 500,000 units with a recorded gross weight of approximately 7,000, but the offloading field is blank, indicating that no unloading was officially recorded.

These findings are consistent with expert testimony from Peruvian civil society and technical experts, who note that while the SPRFMO allows carriers to offload high seas jumbo squid in member state ports, Peru reports very few landings of foreign-flagged jumbo squid vessels in recent years. Any such landings would be visible in both SUNAT's electronic "*ventanilla única*" system, which tracks imports/exports and Peru's annual SPRFMO reports. However, some key informants did note extensive corruption in Peruvian ports where, "you can pay for any document," suggesting that although SUNAT reports no offloading, that does not guarantee it did not occur.

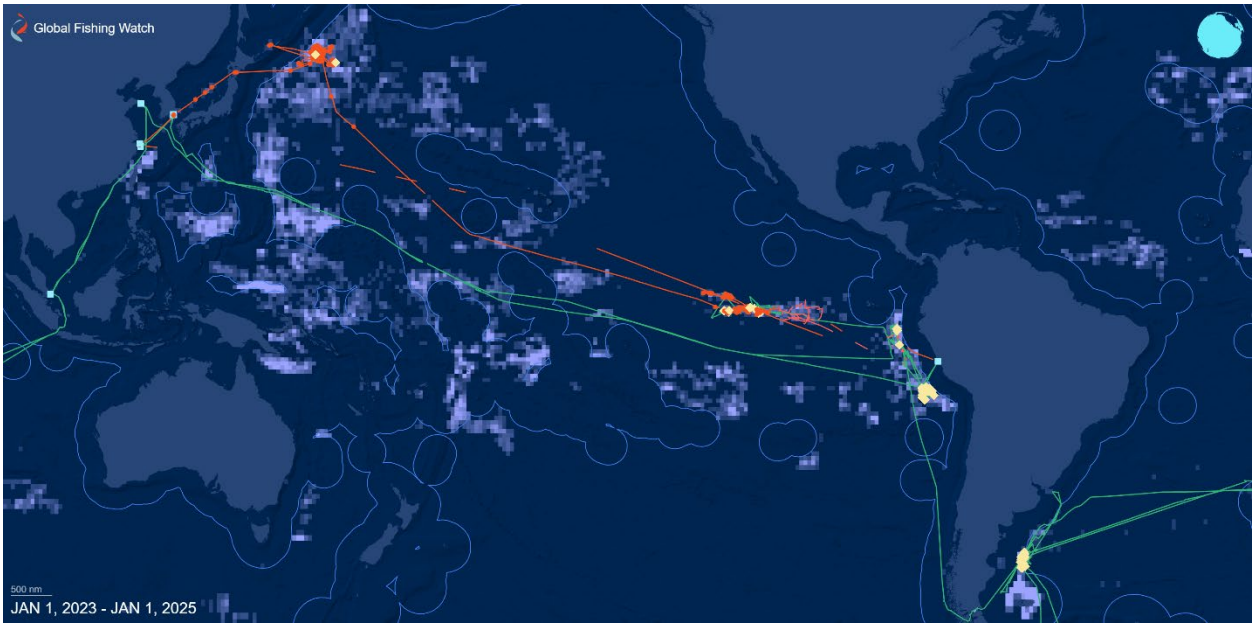
In this case, the combination of a documented port call, a manifest indicating frozen squid transshipped in international waters, and the absence of any recorded discharge strongly suggests that the Sea Dragon

[93] Fishing vessel track is red, while carrier vessel track is green. Fishing vessel encounters (between Prosperous and Sea Dragon as well as other vessels) are cream squares. Fishing presence of all vessels within our dataset is lilac.

entered Callao solely for port services and formalities (e.g., bunkering, inspections, documentation) before departing with its squid cargo still on board.

Subsequent AIS tracking shows that the Sea Dragon made port calls to Shidao, China, immediately after leaving Peru. Shidao, located in Shandong Province, is a major hub for squid import and processing, with large-scale operations managed by companies such as the Chishan Group—an entity previously identified as employing North Korean forced labor in a recent Outlaw Ocean report (Outlaw Ocean Project, 2019).

Figure A3. Vessel interactions with Prosperous (red) and Sea Dragon (green) return to Chinese ports[94]



Source: GFW, 2025

Downstream Processing and Mixing (Peru and Asian Hubs)

Although this carrier visit does not provide documented evidence of Chinese-caught jumbo squid being landed in Callao, it illustrates how Chinese distant water squid vessels operating just outside Peru's EEZ can interact with Peruvian ports under existing "forced arrival" and port access rules. "Forced arrival" (*arribo forzoso*) is a legal mechanism in Peruvian maritime law that allows foreign vessels to enter port without prior authorization when they face an emergency or exceptional situation (such as safety, health, or technical problems) that prevents them from continuing their voyage (Goodman, 2023; Molinari, 2025).

It can create a loophole if a vessel declares an emergency to gain port access, then uses that stay to illegally or semi-legally offload catch under weaker scrutiny than a normal commercial call, especially where port controls, documentation checks, and monitoring of cargo movement are limited or inconsistently enforced. Peruvian authorities and non-governmental organizations have flagged forced arrival port access as a point of pressure and potential vulnerability through which Chinese-caught squid could enter Peruvian supply chains (Estrada, 2023; Montecalvo et al., 2023).

When foreign jumbo-squid carriers offload in authorized Peruvian ports, their product would be expected to enter this same domestic supply chain. Once at the plant, jumbo squid from different

[94] Note that the carrier is associated with several fishing areas known for squid. The carrier track is green, while the fishing vessel track is red.

vessels and flag states is typically pooled and processed together, so that any high seas catch delivered by foreign carriers becomes indistinguishable from squid landed by Peruvian artisanal vessels.

In the Sea Dragon case, however, SUNAT and SPRFMO-related data indicate no recorded discharge in Callao, so there is no evidence that its squid entered Peruvian plants. Instead, the most plausible scenario is that the carrier continued to Shidao, China, and most likely unloaded catch at that port.

This aligns with broader descriptions of the Chinese distant water squid fleet, which routinely lands jumbo squid in Chinese ports for primary or secondary processing, often mixing Peruvian-origin squid (whether caught in the Peruvian EEZ or on adjacent high seas) with catches from other regions before domestic consumption or export (Aroni, 2020, 2025; Montecalvo et al., 2023).

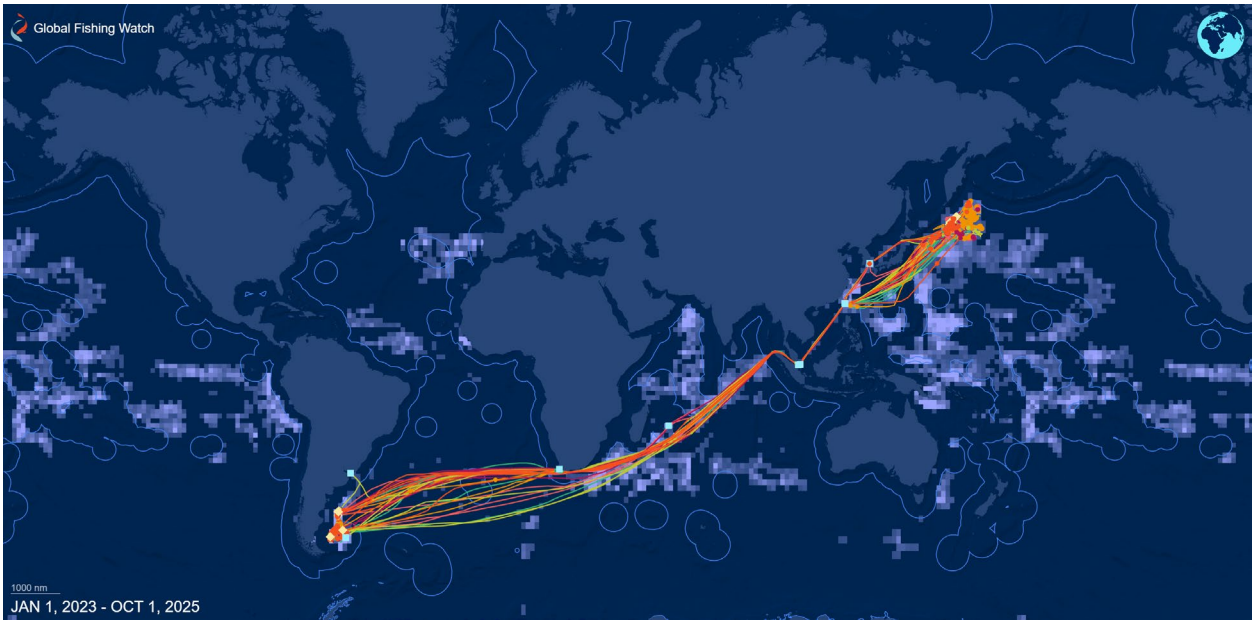
SUPPLY CHAIN CASE STUDY 3: TAIWAN

Fishing and Transshipment

Pacific chub mackerel (*Scomber japonicus*) accounts for approximately 8% (Food and Agriculture Organization of the United Nations, 2025a) of Taiwan's seafood production, estimated at 70,000–75,000 metric tons (MT) annually. The species is harvested primarily by Taiwan's DWF fleet, the second largest globally, operating in the Northwest Pacific between April and November (Taiwan Fisheries Agency, 2024). Catches are frozen on board at temperatures ranging from minus 40 to minus 60 degrees Celsius to preserve quality during voyages that last 1 to 4 months.

Taiwan's distant water squid fleet operating in South American waters often shifts to pacific chub mackerel during the squid off-season. North Pacific Fisheries Commission (NPFC) authorizations and AIS tracking confirm seasonal operations for vessels such as Tailwind, Good Luck, Admiral, Swift, Fortune, First, and Abundance, with port calls in Kaohsiung and movements via Cape Town, Port Stanley, and Singapore/Malacca (NPFC, 2025; Vessel Finder, 2025). Each of those vessels was connected to one or more forced labor indicators according to worker interviews. Landings pass through fishermen's association auctions before entering processors for freezing and individually quick frozen packaging, primarily for export to Japan (Taiwan Fisheries Agency, 2024).

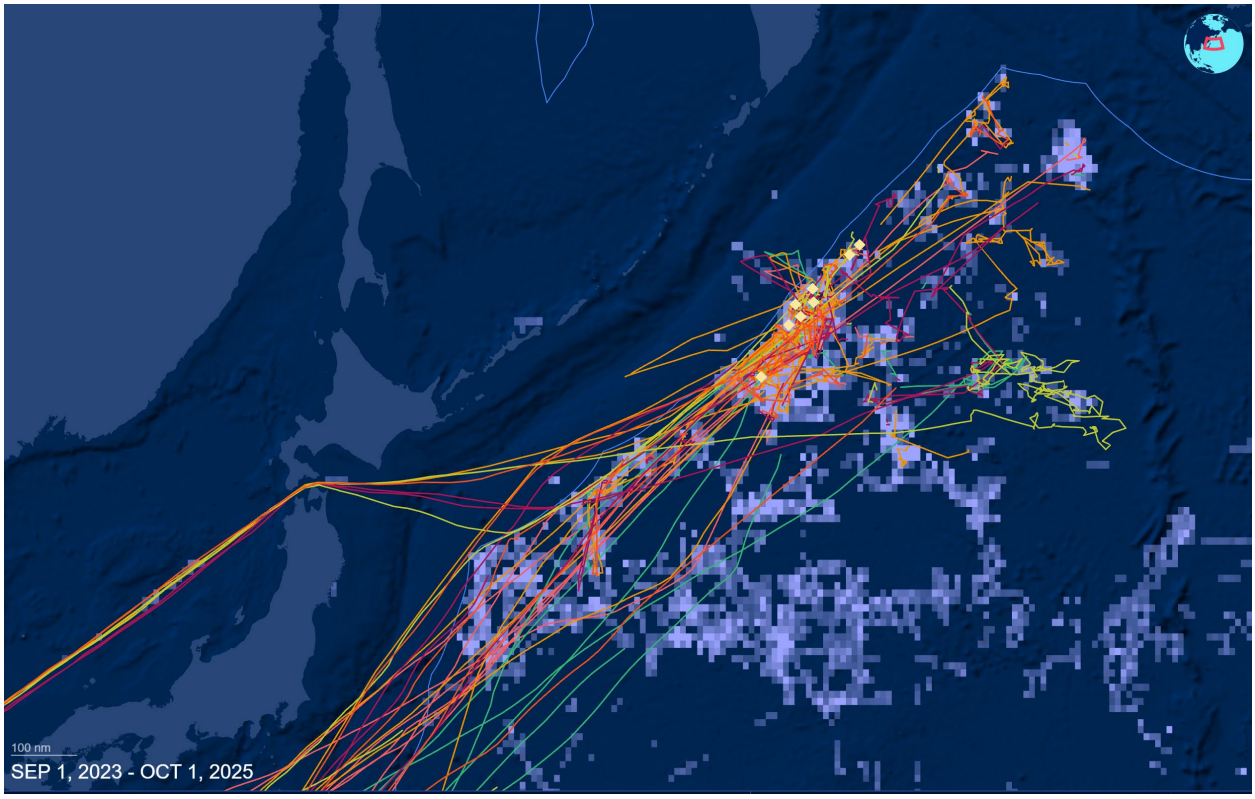
Figure A4. Movement of vessels Tailwind, Good Luck, Admiral, Swift, Fortune, First, and Abundance in and between squid fishing grounds off South America and *Scomber* fishing grounds off Japan's east coast



Source: GFW, 2025

Between September 2023 and October 2025, transshipment practices in the pacific chub mackerel fishery off Japan's east coast drew increasing regulatory and social attention. The NPFC reported that in 2024, Taiwanese-flagged vessels conducted 28 fishing boat to carrier transshipments, moving approximately 7,762 MT of fish products, likely including chub mackerel alongside other mackerel species, Pacific saury, squid, and small pelagic species like sardines. At its March 2025 Osaka meeting, the NPFC mandated independent observers aboard all carriers and tightened reporting requirements to curb IUU fishing and improve transparency (North Pacific Fisheries Commission, 2025). Concurrently, the Yilan Migrant Fishermen Union and the Taiwan Association for the Promotion of Human Rights warned that opaque transshipment enables labor exploitation, including excessive working hours and withheld wages (Taiwan Association for the Promotion of Human Rights, 2025; Yilan Migrant Fishermen Union, 2024).

Figure A5. Movement and encounter events of vessels Tailwind, Good Luck, Admiral, Swift, Fortune, First, and Abundance while fishing for *Scomber*



Source: GFW, 2025

Between September 2023 and October 2025, the aforementioned vessels had 12 encounters with 4 other fishing and carrier vessels while at sea. Four of the vessels operated primarily within the NPFC and WCPFC regulatory frameworks. Registry and RFMO data confirm that two are Taiwan-flagged fishing vessels authorized for squid and saury fisheries, and another is Vanuatu-flagged with similar authorizations (North Pacific Fisheries Commission, 2023, 2024). The fourth, in contrast, is a large Vanuatu-flagged fish carrier authorized for transshipment of tuna, mackerel, and squid, with a hold capacity exceeding 15,000 m³ (Western and Central Pacific Fisheries Commission, 2024). AIS tracking and RFMO records indicate repeated port calls at Kaohsiung, Busan, and Shimizu, which are major hubs for processing and export. These patterns strongly suggest that landings and transshipments during this period were integrated into Taiwan's export-oriented supply chains, with product flows directed toward wholesale markets and cold chain facilities in East Asia rather than retained for domestic consumption (North Pacific Fisheries Commission, 2023; Western and Central Pacific Fisheries Commission, 2024).

Despite detailed vessel authorizations and port call data, publicly accessible sources do not disclose the specific companies receiving these deliveries. RFMO registries list vessel owners and contact companies, but these entities are vessel operators rather than shore-side buyers (North Pacific Fisheries Commission, 2023; Western and Central Pacific Fisheries Commission, 2024). The absence of buyer-level transparency reflects structural limitations in fisheries governance, in which transshipment and landing data are aggregated for compliance rather than commercial traceability. Consequently, while operational evidence confirms that these vessels delivered catch into Kaohsiung and other East Asian ports during the study period, identifying recipient firms requires triangulation of customs import records, wholesale auction ledgers, and corporate procurement disclosures, which are not included in RFMO datasets (North Pacific Fisheries Commission, 2024; Western and Central Pacific Fisheries Commission, 2024). This lack of granularity underscores ongoing challenges in achieving full supply chain

transparency for distant water fleets operating under multilateral management regimes (North Pacific Fisheries Commission, 2023). Traceability challenges in the *Scomber* fishery include limited transparency in species-specific export data.

Processing

Landings are concentrated at Qianzhen Fishing Port in Kaohsiung, which handles up to 30% of Taiwan's fishery output (Round Taiwan Round, 2025). The adjacent Port of Kaohsiung serves as the primary export hub, supported by container terminals and cold storage infrastructure. Secondary ports such as Nanfang'ao in Yilan and Keelung provide additional landing points, though distant water mackerel primarily enters through Kaohsiung.

Processing facilities are clustered in Kaohsiung's industrial zones, enabling rapid transfer from port to plant. For *Scomber japonicus*, primary freezing is typically conducted on board on distant water vessels using blast, plate, or brine systems within hours of capture. Shore-based facilities focus on grading, repackaging, cold storage, and further processing such as canning, smoking, or curing. Advanced freezing technologies such as "Cells Alive System" may be applied post-landing for specialty products. Taiwanese processors offer a wide range of mackerel products, including whole-round frozen fish packaged in 10 kg cartons with glazing, fillets vacuum-packed or individually quick frozen, and canned formats in 100 g and 200 g tins featuring tomato or chili sauces, kabayaki-style glaze, or brine (JFC International, 2025; Lee, K, 2023; Tridge, 2022). Smoked and marinated products, including miso-cured and kelp-marinated shime saba, reflect Japanese culinary traditions (JFC International, 2025).

Export Markets

Mackerel accounts for approximately 8% of Taiwan's annual seafood landings (~70,000–75,000 metric tons), with distant water operations contributing significantly (Food and Agriculture Organization of the United Nations, 2025a; Lee, K, 2023; Taiwan Fisheries Agency, 2024). Nearly all the Taiwanese $22.9 million mackerel exports (98% by value, 99.7% by volume) were in the form of frozen mackerel (TDM, 2025).

Official Taiwanese fisheries and trade statistics do not report species-specific utilization rates for *Scomber japonicus*, as mackerel exports are recorded under aggregated customs categories that combine multiple *Scomber* species, while domestic distribution data are not disaggregated by species (Taiwan Fisheries Agency, 2023). Species-level landing studies nevertheless indicate that *S. japonicus* constitutes a substantial share of Taiwan's mackerel catch, with annual landings on the order of tens of thousands of tons (Fisheries Research Institute, 2019). When these landing data are considered alongside Taiwan's mackerel trade structure, the evidence indicates that the majority of *S. japonicus* caught by Taiwanese vessels is exported rather than consumed domestically. Applying the overall fisheries utilization framework (Food and Agriculture Organization of the United Nations, 2024) yields a conservative estimate of approximately two-thirds exported; however, mackerel is disproportionately directed to frozen export and bait markets. Accordingly, a more plausible mackerel-specific estimate is that approximately 70–90% of Taiwanese-caught *S. japonicus* is exported, with 10–30% retained for domestic consumption, primarily in fresh or locally processed forms (Fisheries Research Institute, 2019; Taiwan Fisheries Agency, 2023).

Table A1. Taiwanese mackerel exports by HS code

HS codes	Value (USD)	% by value	Quantity (MT)	% by quantity
Total	$ 22,897,769	100.0%	24,546	100.0%
303.54	$ 22,423,692	97.9%	24,466	99.7%
1604.15	$ 461,748	2.0%	80	0.3%
305.54	$ 12,329	0.1%	1	0%

Source: Trade Data Monitor, 2025. Value free on board, as reported by Taiwan.

In 2024, the largest destination markets for Taiwan's frozen mackerel exports by value were Egypt (39.7%), Thailand (21.0%), and Malaysia (14%). Compared to 2023, Egyptian imports increased by 60%, Thailand decreased by 42%, and Malaysia increased by 55% (TDM 2025).

Globally, Japan is the largest import market for prepared or preserved mackerel in Asia-Pacific, importing about 25–27 thousand MT annually and paying average prices above USD $5,600 per MT in 2024 (IndexBox, 2026a; Tridge, 2022). Other destinations include Thailand, which processes and re-exports canned/preserved mackerel into regional and global markets, and Southeast Asian countries such as Indonesia, Malaysia, and Singapore (IndexBox, 2026b; Kodanmal Group, 2025). In the broader Asia-Pacific, consumption of prepared or preserved mackerel reached about 696,000 MT in 2024, valued at roughly USD $1.9 billion, with China (36%), India (15%), and Japan (7%) as leading consumers (Food and Agriculture Organization of the United Nations, 2025b; IndexBox, 2026a).

Between 2023 and 2025, publicly available data indicate that the Taiwanese vessels Tailwind, Good Luck, Admiral, Swift, Fortune, First, and Abundance were primarily authorized for Pacific saury (*Cololabis saira*) and flying squid fisheries under NPFC regulations (NPFC, 2024; NPFC, 2025). Although Taiwan's mackerel exports during this period were significant, involving processors and exporters like Shine Young Marine Enterprise and Leader Group International, no verifiable evidence links the listed vessels to mackerel supply chains or specific overseas importers (Tridge, 2022).

APPENDIX 6: FINAL RESEARCH INSTRUMENTS

WORKER INTERVIEW GUIDE

Field	Question	Answer
CONSENT		
S1Q01 *(required)*	S1Q01. Have you worked on a foreign fishing vessel in the past year? *Question relevant when: CONSENT = 1*	1 1. YES 2 2. NO 7 7 77. DON'T KNOW 9 9 99. REFUSED
S1Q02 *(required)*	S1Q02. How old are you? [IF NEEDED, SAY: Your best guess is fine] *Question relevant when: S1Q01 = 1*	
SECTION 1: GENERAL INFORMATION *Group relevant when: CONSENT = 1 and (S1Q02 > 17 or S1Q02 = -76) and (S1Q01 = 1)*		
S1Q03 *(required)*	S1Q03. INTERVIEWER: MARK RESPONDENT'S SEX. ASK IF UNSURE.	1 1. MALE 2 2. FEMALE 3 3. PREFER NOT TO SAY
S1Q04 *(required)*	S1Q04. Where were you born?	1 1. INDONESIA 5 5 55. OTHER COUNTRY 7 7 77. DON'T KNOW 9 9 99. REFUSED
S1Q04A *(required)*	S1Q04A. In which province of Indonesia were you born? *Question relevant when: S1Q04 = 1*	1 1. SPECIAL REGION OF ACEH 2 2. BALI 3 3. BANGKA-BELITUNG 4 4. BANTEN 5 5. BENGKULU 6 6. CENTRAL JAVA 7 7. CENTRAL KALIMANTAN

Field	Question	Answer
		8 8. CENTRAL SULAWESI 9 9. EAST JAVA 10 10. EAST KALIMANTAN 11 11. EAST NUSA TENGGARA 12 12. GORONTALO 13 13. JAKARTA SPECIAL CAPITAL REGION 14 14. JAMBI 15 15. LAMPUNG 16 16. MALUKU (MOLUCCAS) 17 17. NORTH KALIMANTAN 18 18. NORTH MALUKU (N.MOLUCCAS) 19 19. NORTH SULAWESI 20 20. NORTH SUMATRA 21 21. SPECIAL REGION OF PAPUA 22 22. RIAU 23 23. RIAU ISLANDS 24 24. SOUTH EAST SULAWESI 25 25. SOUTH KALIMANTAN 26 26. SOUTH SULAWESI 27 27. SOUTH SUMATRA

Field	Question	Answer
		28. SOUTHWEST PAPUA 29. WEST JAVA 30. WEST KALIMANTAN 31. WEST NUSA TENGGARA 32. SPECIAL REGION OF WEST PAPUA 33. WEST SULAWESI 34. WEST SUMATRA 35. SPECIAL REGION OF YOGYAKARTA 77. DON'T KNOW 99. REFUSED
S1Q05 *(required)*	S1Q05. Have you ever attended school?	1. YES 2. NO 77. DON'T KNOW 99. REFUSED
S1Q05A *(required)*	S1Q05A. What is the highest class you have completed? *Question relevant when: S1Q05 = 1*	1. PRESCHOOL/NURSERY SCHOOL 2. SOME ELEMENTARY 3. ELEMENTARY 4. SOME JUNIOR HIGH 5. JUNIOR HIGH 6. SOME SENIOR HIGH 7. SENIOR HIGH 8. HIGHER 77. DON'T KNOW

Field	Question	Answer
		9 99. REFUSED 9
S1Q05B *(required)*	S1Q05B. How many foreign fishing vessels have you worked on?	
S1Q05C *(required)*	S1Q05C. What year did you start your **first** job on a foreign fishing vessel? *Question relevant when: S1Q05B DOES NOT EQUAL 1*	
GI_READ	READ: For the following questions, please think about your **most recent** fishing trip in international waters. *Question relevant when: S1Q05B DOES NOT EQUAL 1*	
S5Q22 *(required)*	S5Q22. What is the name of the vessel you worked on?	
S5Q22A *(required)*	INTERVIEWER: ASK THE RESPONDENT TO WRITE THE NAME OF THE VESSEL ON A PIECE OF PAPER SO THAT YOU CAN TAKE A PHOTO. WAS THE NAME WRITTEN DOWN?	1 YES 2 NO
S5Q22A_PHOTO *(required)*	TAKE A PHOTO OF THE HANDWRITTEN VESSEL NAME *Question relevant when: S5Q22A = 1*	
S5Q22B *(required)*	S5Q22B. Did the vessel have a number?	1 1. YES 2 2. NO 7 77. DON'T KNOW 7 9 99. REFUSED 9
S5Q22C *(required)*	S5Q22C. What was the number? *Question relevant when: S5Q22B = 1*	
S5Q16 *(required)*	S5Q16. What was the flag state of the vessel?	1 1. CHINA 2 2. TAIWAN 3 3. PANAMA 4 4. VANUATU 5 5. BELIZE

Field	Question	Answer
		66. LIBERIA 77. MAURITIUS 88. SOUTH KOREA 55. OTHER 77. DON'T KNOW 99. REFUSED
S5Q17 *(required)*	S5Q17. Where was the captain from?	11. CHINA 22. TAIWAN 33. SOUTH KOREA 44. JAPAN 55. INDONESIA 55. OTHER 77. DON'T KNOW 99. REFUSED
S5Q17A *(required)*	S5Q17A. What was the name of the captain?	
S5Q18 *(required)*	S5Q18. What countries did the rest of the crew come from? SELECT ALL THAT APPLY	11. CHINA 22. TAIWAN 33. SOUTH KOREA 44. JAPAN 55. INDONESIA 66. PHILIPPINES 77. VIETNAM 88. NORTH KOREA 55. OTHER 77. DON'T KNOW 99. REFUSED
SECTION 1: GENERAL INFORMATION > S1Q06_group		
S1Q06 *(required)*	S1Q06.	11. JANUARY

Field	Question	Answer
	Approximately when did you **start** this job? [SELECT MONTH (IF KNOWN)]	2 2. FEBRUARY 3 3. MARCH 4 4. APRIL 5 5. MAY 6 6. JUNE 7 7. JULY 8 8. AUGUST 9 9. SEPTEMBER 10 10. OCTOBER 11 11. NOVEMBER 12 12. DECEMBER 77 77. DON'T KNOW 99 99. REFUSED
S1Q06_YEAR *(required)*	[RECORD YEAR STARTED MOST RECENT TRIP.]	
INVALID_START_DATE_CHECK *(required)*	The start of this job date that has been selected ([S1Q06] / [S1Q06_YEAR]) is greater than the current date (09 / 2025). Please return and fix the entry. *Question relevant when: INVALID_START_MONTH_FLAG = 1*	
INVALID_DISCR *(required)*	ERROR: THE RESPONDENT MUST HAVE STARTED THEIR MOST RECENT JOB AFTER THEY STARTED THEIR FIRST JOB IN FISHING, SINCE THE RESPONDENT INDICATED HE HAD MORE THAN ONE JOB IN FISHING. GO BACK AND FIX. *Question relevant when: S1Q05C > S1Q06_YEAR*	
SECTION 1: GENERAL INFORMATION > S1Q07A_group		
S1Q07A *(required)*	S1Q07A. Approximately when did you **return** from this fishing trip? [SELECT MONTH (IF KNOWN)]	1 1. JANUARY 2 2. FEBRUARY 3 3. MARCH 4 4. APRIL 5 5. MAY 6 6. JUNE 7 7. JULY

Field	Question	Answer
		8 8. AUGUST 9 9. SEPTEMBER 10 10. OCTOBER 11 11. NOVEMBER 12 12. DECEMBER 77 77. DON'T KNOW 99 99. REFUSED
S1Q07A_YEAR *(required)*	[INTERVIEWER: RECORD YEAR OF RETURN.]	
INVALID_RETURN_DATE_CHECK *(required)*	The return date that has been selected ([S1Q07A] / [S1Q07A_YEAR]) is greater than the current date (09 / 2025). Please return and fix the entry. *Question relevant when:* *INVALID_RETURN_MONTH_FLAG = 1*	
INVALID_RETURN_DATE_CHECK_2 *(required)*	The return date that has been selected ([S1Q07A] / [S1Q07A_YEAR]) must be between [S1Q06] / [S1Q06_YEAR] and 09 / 2025. Please return and fix the entry. *Question relevant when:* *INVALID_RETURN_MONTH_FLAG_2 = 1*	
S5Q19 *(required)*	S5Q19. Where was (were) the fishing ground(s)? PROBE FOR LOCATION CLOSE TO OR NUMBER OF DAYS FROM A PARTICULAR PORT *Question relevant when: ELIGIBILITY_RETURN_DATE = 1*	
S1Q10 *(required)*	S1Q10. What were you catching? [SELECT ALL THAT APPLY] *Question relevant when: ELIGIBILITY_RETURN_DATE = 1*	11 11. BLUEFIN TUNA 22 22. YELLOWFIN TUNA 33 33. MAHI-MAHI 44 44. SWORD FISH 55 55. SQUID 66 66. SMALL PELAGICS 77 77. ROCKFISH

Field	Question	Answer
		88. BENTHIC FISH 99. MARLIN/ SAIL FISH 5555. OTHER _____ 7777. DON'T KNOW 9999. REFUSED
S5Q21 *(required)*	S5Q21. While at sea, was there offloading of catch to another vessel? *Question relevant when: ELIGIBILITY_RETURN_DATE = 1*	11. YES 22. NO 7777. DON'T KNOW 9999. REFUSED
S5Q21A *(required)*	S5Q21A. FOR EACH VESSEL: What was the name of the transshipment vessel? What was the flag of the transshipment vessel? When did you offload onto the vessel? (IF DATE NOT KNOWN, ASK: Was it the beginning, middle, or end of your trip? What was the weather?) What kind of catch was offloaded? *Question relevant when: S5Q21 = 1*	
S3Q03B *(required)*	S3Q03B. During your last fishing trip, how often did the vessel return to port? *Question relevant when: ELIGIBILITY_RETURN_DATE = 1*	11. MORE THAN ONCE PER MONTH 22. EVERY ONE TO THREE MONTHS 33. EVERY FOUR TO SIX MONTHS 44. LESS OFTEN THAN EVERY 6 MONTHS 7777. DON'T KNOW 9999. REFUSED
S3Q04 *(required)*	S3Q04.	11. YES 22. NO

Field	Question	Answer
	Were you free to leave the vessel when you were in port? *Question relevant when: ELIGIBILITY_RETURN_DATE = 1*	66. NOT APPLICABLE - DID NOT RETURN TO PORT 77. DON'T KNOW 99. REFUSED
S3Q04A *(required)*	S3Q04A. Why not? SELECT ALL THAT APPLY *Question relevant when: S3Q04 = 2*	1. CAPTAIN/EMPLOYER DID NOT ALLOW 2. DID NOT HAVE VISA TO ENTER COUNTRY 3. DID NOT HAVE ACCESS TO PASSPORT 4. TIME IN PORT TOO SHORT 55. OTHER 77. DON'T KNOW 99. REFUSED
S3Q04A_other *(required)*	SPECIFY OTHER *Question relevant when: selected(S3Q04A , '55')*	
S5Q21B *(required)*	S5Q21B. Was there offloading of catch at port? *Question relevant when: ELIGIBILITY_RETURN_DATE = 1*	1. YES 2. NO 77. DON'T KNOW 99. REFUSED
S5Q21BB *(required)*	S5Q21B. In which ports did you offload? FOR EACH PORT: What was the country? Name of port? When did you offload? (IF DATE NOT KNOWN, ASK: Was it the beginning, middle, or end of your trip? What was the weather?) What kind of catch was offloaded? *Question relevant when: S5Q21B = 1*	
S3Q03C_new *(required)*	S3Q03C.	

Field	Question	Answer
	Did the vessel go to any ports but not offload catch? Which ports? *Question relevant when: ELIGIBILITY_RETURN_DATE = 1*	
S5Q20 *(required)*	S5Q20. What was the last harbor? *Question relevant when: ELIGIBILITY_RETURN_DATE = 1*	
SECTION 2: RECRUITMENT *Group relevant when: CONSENT = 1 and (S1Q02 > 17 or S1Q02 = -76) and (S1Q01 = 1) and ELIGIBILITY_RETURN_DATE = 1*		
S2Q01_QUAL	• Please tell me about how you got this job.	
S2Q01 *(required)*	S2Q01. Did you get this job through a manning agency, the vessel captain, a broker, or some other way? [SELECT ALL THAT APPLY]	1 1. MANNING AGENCY 2 2. VESSEL CAPTAIN 3 3. BROKER 55 55. OTHER 77 77. DON'T KNOW 99 99. REFUSED
S2Q01AA1 *(required)*	S2Q01AA1. How did you find the manning agency or broker? SELECT ALL THAT APPLY *Question relevant when: selected(S2Q01 , '1') or selected(S2Q01 , '3')*	1 1. A FRIEND/FAMILY MEMBER INTRODUCED ME 2 2. A BROKER/SPONSOR CAME TO MY COMMUNITY TO LOOK FOR JOBSEEKERS 3 3. I SAW AN ONLINE AD AND CONTACTED THEM 4 4. I REGISTERED WITH A GOVERNMENT PLACEMENT AGENCY IN INDONESIA 5 5. I APPLIED TO AN OVERSEAS GOVERNMENT PLACEMENT AGENCY 55 55. OTHER

Field	Question	Answer
		77. DON'T KNOW 99. REFUSED
S2Q01AA2 *(required)*	S2Q01AA2. What is the name of the manning agency? *Question relevant when: selected(S2Q01 , '1')*	
S2Q01AA3 *(required)*	S2Q01AA3. How did you meet the captain? SELECT ALL THAT APPLY *Question relevant when: selected(S2Q01 , '2')*	1. A FRIEND/FAMILY MEMBER INTRODUCED ME 2. A RETURNED MIGRANT INTRODUCED ME 3. PREVIOUSLY WORKED WITH THE CAPTAIN 55. OTHER 77. DON'T KNOW 99. REFUSED
S2Q01A *(required)*	S2Q01A. Were you charged a "guarantee fee" that you would pay to complete your contract?	1. YES 2. NO 77. DON'T KNOW 99. REFUSED
S2Q01A_QUAL	• How much was the guarantee fee? • Whom did you pay it to? • What were the terms? *Question relevant when: S2Q01A = 1*	
S2Q01A_QUAL2	• Was there a recruitment fee, IF SO, how much and how did you pay it? • Did you have to borrow any money or take on any debt from your recruitment? • IF SO, please explain the nature of that debt and who the debt is owed to.	

Field	Question	Answer
S2Q01B *(required)*	S2Q01B. Did you have to work to pay off debt to the manning agency or employer for costs related to getting the job, such as recruitment fees, travel, training, or a medical exam?	1 1. YES 2 2. NO 7 7 77. DON'T KNOW 9 9 99. REFUSED
S2Q01B_QUAL	• How much was the debt? • Whom was it to? • What was it for? • Did you feel your work was fairly applied to reduce the debt? *Question relevant when: S2Q01B =1*	
S2Q02 *(required)*	S2Q02. Did you take this job out of your own will?	1 1. YES 2 2. NO 7 7 77. DON'T KNOW 9 9 99. REFUSED
S2Q02A *(required)*	S2Q02A. Why did you feel compelled to take this job? INTERVIEWER: SELECT ALL THAT APPLY. ASK "Any other reason?" AT LEAST TWICE BEFORE MOVING ON. PROBE FOR DETAILS AND SPECIFIC EXAMPLES. *Question relevant when: S2Q02 = 2*	1 1. THREATS OF OR SUBJECTION TO PHYSICAL VIOLENCE AGAINST RESPONDENT OR RESPONDENT'S FAMILY BY EMPLOYER/RECRUITER 2 2. RESTRICTION ON RESPONDENT'S MOVEMENT BY EMPLOYER/RECRUITER 3 3. DEBT BONDAGE OR MANIPULATION OF DEBT (DEBT TO EMPLOYER/RECRUITER) 5 5. WITHHOLDING OF VALUABLE DOCUMENTS/GUARANTEE BY EMPLOYER/RECRUITER 7 7. THREAT OF LOSS OF HOUSING/LAND

Field	Question	Answer
		14. VERBAL ABUSE 55. OTHER 66. WORK OPPORTUNITIES ARE SCARCE/WOULD HAVE NO MONEY/ETC 77. DON'T KNOW 99. REFUSED
S2Q03 *(required)*	S2Q03. Did you have a written contract for this work?	1 1. YES 2 2. NO 7 77. DON'T KNOW 9 99. REFUSED
S2Q03AA *(required)*	S2Q03AA. Were you given time to read the contract or have it read to you before you signed it? *Question relevant when: S2Q03 = 1*	1 1. YES 2 2. NO 7 77. DON'T KNOW 9 99. REFUSED
S2Q03AB *(required)*	S2Q03AB. Was it written in a language you understand? *Question relevant when: S2Q03 = 1*	1 1. YES 2 2. NO 7 77. DON'T KNOW 9 99. REFUSED
S2Q03A *(required)*	S2Q03A. Did you have a verbal agreement for this work? *Question relevant when: S2Q03 DOES NOT EQUAL 1*	1 1. YES 2 2. NO 7 77. DON'T KNOW 9 99. REFUSED
S2Q04_QUAL	• What were you told about this job before you took it?	•

Field	Question	Answer
	○ (PROBE: NATURE OF WORK, HOURS, EARNINGS, LIVING CONDITIONS, CONTINUOUS TIME AT SEA) • Who told you this?	
S2Q04 *(required)*	S2Q04. Thinking about what your recruiter or employer told you before you started the job compared to the job you actually did, Were you misled about the job?	1 1. YES 2 2. NO 7 7 77. DON'T KNOW 9 9 99. REFUSED
S2Q04A *(required)*	S2Q04A. What were you misled about? [INTERVIEWER: LISTEN AND SELECT ALL THAT APPLY. ASK "Anything else?" TWICE BEFORE MOVING ON.] PROBE FOR DETAILS AND SPECIFIC EXAMPLES. *Question relevant when: S2Q04 = 1*	1 1. NATURE OF THE JOB (FUNDAMENTAL DUTIES OF THE JOB, TYPE OF JOB) 2 2. WORK TASKS 3 3. HOURS 4 4. EARNINGS (INCLUDING PAY SCHEDULE) 5 5. LIVING CONDITIONS 6 6. HAZARDS 7 7. PORT LOCATION 8 8. LEGALITY OF WORK 9 9. EMPLOYER 1 0 10. CONTINUOUS TIME AT SEA 5 5 55. OTHER 7 7 77. DON'T KNOW 9 9 99. REFUSED
S2Q04B *(required)*	S2Q04B. What would have happened if you had asked for the work or conditions you were promised?	1 1. THREATS OF OR SUBJECTION TO PHYSICAL VIOLENCE AGAINST RESPONDENT OR

Field	Question	Answer
	[INTERVIEWER: LISTEN AND SELECT ALL THAT APPLY. ASK "Any other reason?" TWICE BEFORE MOVING ON.] PROBE FOR DETAILS AND SPECIFIC EXAMPLES. *Question relevant when: S2Q04 = 1*	RESPONDENT'S FAMILY BY EMPLOYER/RECRUITER 2 2. RESTRICTION ON RESPONDENT'S MOVEMENT 3. DEBT BONDAGE OR MANIPULATION OF DEBT 3 (DEBT TO EMPLOYER/RECRUITER) 5. WITHHOLDING OF VALUABLE 5 DOCUMENTS/GUARANTEE BY EMPLOYER/RECRUITER 7. THREAT OF LOSS OF 7 HOUSING/LAND 9. DISMISSAL/SENT HOME 9 OR THREATS OF 1 12. ABUSE OF ISOLATION 2 1 13. DEPRIVATION OF FOOD, 3 WATER, SLEEP 1 14. VERBAL ABUSE 4 5 55. OTHER 5 6 66. NOTHING 6 7 77. DON'T KNOW 7 9 99. REFUSED 9
S1Q08_QUAL	• Please tell me about how you got to the vessel.	
S1Q08 *(required)*	S1Q08. Did you join the vessel in a harbor or did you get there with a vessel?	1 1. HARBOR 2 2. VESSEL 7 77. DON'T KNOW 7 9 99. REFUSED 9

Field	Question	Answer
S1Q08A *(required)*	S1Q08A. Were you transferred from another fishing vessel or a transfer vessel? *Question relevant when: S1Q08 = 2*	1 1. ANOTHER FISHING VESSEL 2 2. TRANSFER VESSEL 7 7 77. DON'T KNOW 9 9 99. REFUSED
S1Q08B *(required)*	S1Q08B. Did you agree to be transferred? *Question relevant when: S1Q08A = 1*	1 1. YES 2 2. NO 7 7 77. DON'T KNOW 9 9 99. REFUSED
S1Q08B_QUAL	• Please tell me more about that. How did the transfer happen against your will? *Question relevant when: S1Q08B =2*	
S1Q09 *(required)*	S1Q09. Which harbor did you (originally) depart from? [INTERVIEWER: RECORD COUNTRY. RECORD NAME OF HARBOR IF KNOWN.]	
S1Q09A *(required)*	S1Q09A. What type of vessel did you work on?	1 1. SEINER 2 2. TRAWLER 3 3. TRAP SETTER 4 4. LONG LINE VESSEL 5 5. GILLNETTER 6 6. DREDGER 7 7. LIFT NETTER 8 8. HANDLINER 9 9. TRANSFER VESSEL 1 0 10. SQUID JIGGER 5 5 55. OTHER _____ 7 7 77. DON'T KNOW

Field	Question	Answer
		99. REFUSED
S1Q09A_QUAL	• What type of catch did you procur? Did you specialize in only one type of catch? Or did you collect different types of seafood on different trips? • How many times did you collect catch from other vessels in one trip? • How many vessels if you gather catch from before returning to shore? • Do you know what ships you collected seafood from? (Vessel name, country flag, nationality of workers, captain, etc)? • How was the catch weighed on board? • Was the catch from different vessels co-mingled on board the transfer vessel? • What ports did you unload the seafood? How often did you go into port to unload? (If more than one type of seafood caught- probe for type of catch unloaded in specific ports) *Question relevant when: S1Q09A =9*	
S1Q11 *(required)*	S1Q11. In which of these activities did you engage in the most recent month you worked? READ ALOUD RESPONSE OPTIONS AND SELECT ALL THAT APPLY	1 1. Fishing 2 2. Butchering 3 3. Freezing/storage 4 4. Transfer of catch to other ships 5 5. Cleaning 6 6. Cooking 7 7. Engine room work 8 8. Vessel maintenance 66 66. NONE OF THESE 77 77. DON'T KNOW 99 99. REFUSED

Field	Question	Answer
S1Q11_OTHER_WORK *(required)*	S1Q11_OTHER_WORK. Did you do any other work related activities?	1 1. YES 2 2. NO 7 77. DON'T KNOW 7 9 99. REFUSED 9
S1Q11_OTHER_WORK_FOLLOW_UP *(required)*	S1Q11_OTHER_WORK_FOLLOW_UP. *Question relevant when: S1Q11_OTHER_WORK = 1*	
S1Q11A *(required)*	S1Q11A. On which of these activities did you spend the most time? *Question relevant when: numselected_S1Q11_tot > 0*	1 1. Fishing 2 2. Butchering 3 3. Freezing/storage 4 4. Transfer of catch to other ships 5 5. Cleaning 6 6. Cooking 7 7. Engine room work 5 55. OTHER WORK RELATED ACTIVITY: ... 7 77. DON'T KNOW 7 9 99. REFUSED 9
SECTION 3: LIVING CONDITIONS *Group relevant when: CONSENT = 1 and (S1Q02 > 17 or S1Q02 = -76) and (S1Q01 = 1) and ELIGIBILITY_RETURN_DATE = 1*		
S3Q02A_QUAL	• Now I would like to ask you about your living conditions on board. What were they like?	
S3Q02A *(required)*	S3Q02A. Could you always access enough clean drinking water?	1 1. YES 2 2. NO 7 77. DON'T KNOW 7 9 99. REFUSED 9
S3Q02B *(required)*	S3Q02B. Were you ever hungry because there was not enough food to eat?	1 1. YES 2 2. NO 7 77. DON'T KNOW 7

Field	Question	Answer
		9 99. REFUSED 9
S3Q02B_QUAL	• Please tell me more about being hungry. *Question relevant when: S3Q02B = 1*	
S3Q02C *(required)*	S3Q02C. How would you describe the quality of the food--Would you say good, ok, or bad?	1 1. GOOD 2 2. OK/FINE 3 3. BAD 7 77. DON'T KNOW 7 9 99. REFUSED 9
S3Q02D *(required)*	S3Q02D. How would you describe the quality of your sleeping quarters--Would you say good, ok, or bad?	1 1. GOOD 2 2. OK/FINE 3 3. BAD 7 77. DON'T KNOW 7 9 99. REFUSED 9
S3Q02E *(required)*	S3Q02E. Do you feel that your accommodations were harmful to your health?	1 1. YES 2 2. NO 7 77. DON'T KNOW 7 9 99. REFUSED 9
S3Q02E_QUAL	• How do you feel it was harmful to your health? *Question relevant when: S3Q02E = 1*	
S3Q02F *(required)*	S3Q02F. Did you feel safe in your sleeping quarters?	1 1. YES 2 2. NO 7 77. DON'T KNOW 7 9 99. REFUSED 9
S3Q02F_QUAL	• What made you feel unsafe? *Question relevant when: S3Q02F = 2*	

Field	Question	Answer
S3Q02G *(required)*	S3Q02G. Did you have a safe space to store your belongings?	1 1. YES 2 2. NO 7 7. DON'T KNOW 9 9. REFUSED
S3Q03 *(required)*	S3Q03. Did your employer ever threaten to lock you up or actually lock you up?	1 1. YES 2 2. NO 7 7. DON'T KNOW 9 9. REFUSED
S3Q03_QUAL	• Tell me more about that. • Did it ever actually happen? • What were the circumstances? • Where were you locked? • How many times did it happen? *Question relevant when: S3Q03 = 1*	
S3Q03A *(required)*	S3Q03A. How often did you have access to phone network, radio, or WiFi so that you could make calls or send messages during your free time – would you say always, usually, rarely, or never?	1 1. ALWAYS 2 2. USUALLY 3 3. RARELY 4 4. NEVER 7 7. DON'T KNOW 9 9. REFUSED
S3Q03A_QUAL	• Tell me more about your access to communications. *Question relevant when: S3Q03A = 3 or S3Q03A = 4*	
S3Q04_QUAL2	• Was it possible to return to shore for any reason aside from regularly scheduled returns? • (PROBE FOR WHAT HAPPENS IN THE CASE OF SICKNESS AND INJURY)	
S3Q05 *(required)*	S3Q05.	1 1. MYSELF

Field	Question	Answer
	While you were at sea, who held your passport and seaman book?	2. 2 EMPLOYER/CAPTAIN/FOREMAN 3 3. MANNING AGENT 5 5 55. OTHER 7 7 77. DON'T KNOW 9 9 99. REFUSED
S3Q05AA *(required)*	S3Q05AA. While at sea, could you access your documents if needed? *Question relevant when: selected(S3Q05 , '2') or selected(S3Q05 , '3') or selected(S3Q05 , '55')*	1 1. YES 2 2. NO 7 7 77. DON'T KNOW 9 9 99. REFUSED
S3Q05A *(required)*	S3Q05A. While at port, could you access your documents if needed? *Question relevant when: selected(S3Q05 , '2') or selected(S3Q05 , '3') or selected(S3Q05 , '55')*	1 1. YES 2 2. NO 7 7 77. DON'T KNOW 9 9 99. REFUSED
S3Q05_QUAL	• Did you ever try to access your documents? • What happened? *Question relevant when: S3Q05AA = 2 or S3Q05A = 2*	
SECTION 4: DEBT AND PAYMENT *Group relevant when: CONSENT = 1 and (S1Q02 > 17 or S1Q02 = -76) and (S1Q01 = 1) and ELIGIBILITY_RETURN_DATE = 1*		
S4Q01 *(required)*	S4Q01. While working on your most recent vessel, did your employer charge you excessive or unagreed amounts for food, water, or medicine?	1 1. YES 2 2. NO 7 7 77. DON'T KNOW 9 9 99. REFUSED
S4Q01_QUAL	• Tell me more about that. • What were you charged for? *Question relevant when: S4Q01 = 1*	

Field	Question	Answer
S4Q01A *(required)*	S4Q01A. Did these amounts put you in debt with your employer? *Question relevant when: S4Q01 = 1*	1 1. YES 2 2. NO 7 7 77. DON'T KNOW 9 9 99. REFUSED
S4Q01AA *(required)*	S4Q01AA. Were you ever fined at work?	1 1. YES 2 2. NO 7 7 77. DON'T KNOW 9 9 99. REFUSED
S4Q01AA_QUAL	• How much was the fine? • What was it for? • How many times did it happen? *Question relevant when: S4Q01AA = 1*	
S4Q01B *(required)*	S4Q01B. Did you go into debt with your employer due to fines? *Question relevant when: S4Q01AA = 1*	1 1. YES 2 2. NO 7 7 77. DON'T KNOW 9 9 99. REFUSED
S4Q01BB_alt *(required)*	S4Q01BB_alt. Did you have any other debt with your employer?	1 1. YES 2 2. NO 7 7 77. DON'T KNOW 9 9 99. REFUSED
S4Q01BB_alt_QUAL	• What is the debt for? • How much is it? • What are the terms? *Question relevant when: S4Q01BB_alt = 1*	
S4Q01C *(required)*	S4Q01C. Thinking about any debt you had with your manning agent, employer, or broker …	1 1. YES 2 2. NO 7 7 77. DON'T KNOW

Field	Question	Answer
	Did they unfairly increase the amount of your debt over time? *Question relevant when: S2Q01B = 1 or S4Q01A = 1 or S4Q01B = 1 or S4Q01BB_alt = 1*	9 99. REFUSED 9
S4Q01C_QUAL	• Tell me more about that. • What were the terms? *Question relevant when: S4Q01C = 1*	
S4Q01D *(required)*	S4Q01D. Did any of these debts prevent you from leaving the vessel if you wanted to? *Question relevant when: S2Q01B = 1 or S4Q01A = 1 or S4Q01B = 1 or S4Q01BB_alt = 1*	1 1. YES 2 2. NO 7 77. DON'T KNOW 7 9 99. REFUSED 9
S4Q01D_QUAL	• How did your debt prevent you from leaving the vessel if you wanted to? *Question relevant when: S4Q01D = 1*	
SECTION 4: DEBT AND PAYMENT > EARNINGS		
S4Q02 *(required)*	S4Q02. Now I would like to ask you about your earnings. Please only include the earnings from your basic wages, not any overtime pay or bonuses you may receive. Include only the amount you take home, after any deductions by your employer. About how much did you earn for a typical month's work? INTERVIEWER: IF RESPONDENT IS PAID IN KIND, ASK RESPONDENT TO ESTIMATE VALUE IN CURRENCY RECORD AMOUNT	
S4Q02_CUR *(required)*	RECORD CURRENCY	1 CHINESE YUAN (RMB) 2 TAIWANESE DOLLAR (TWD) 3 INDONESIAN RUPIAH (IDR) 4 JAPANESE YEN 5 KOREAN WON

Field	Question	Answer
		6 USD 7 EURO 55. OTHER 77. DON'T KNOW 99. REFUSED
warning_earnings *(required)*	Just to confirm, you said your monthly income was **[S4Q02_formatted] [curr_disp]**, which is approximately **[chin_usd][taiw_usd][indo_usd][japa_usd][kore_usd][usd_usd][euro_usd] US$** . Did I record your monthly earnings correctly? *Question relevant when: chin_usd < 300 or taiw_usd < 300 or indo_usd < 300 or japa_usd < 300 or kore_usd < 300 or usd_usd < 300 or euro_usd < 300 or chin_usd > 700 or taiw_usd > 700 or indo_usd > 700 or japa_usd > 700 or kore_usd > 700 or usd_usd > 700 or euro_usd > 700*	1 YES 2 NO
error *(required)*	GO BACK AND CORRECT EARNINGS *Question relevant when: warning_earnings = 2*	
S4Q03 *(required)*	S4Q03. Who paid you?	1 1. FISHING COMPANY 2 2. VESSEL CAPTAIN 3 3. MANNING AGENT 55. OTHER 77. DON'T KNOW 99. REFUSED
S4Q04 *(required)*	S4Q04. Did you ever have trouble getting your earnings?	1 1. YES 2 2. NO 77. DON'T KNOW 99. REFUSED
S4Q04AA *(required)*	S4Q04AA.	1 1. COULDN'T ACCESS BANK ACCOUNT

Field	Question	Answer
	What was the trouble? PROBE FOR DETAILS *Question relevant when: S4Q04 = 1*	2. EXCESSIVE DEDUCTIONS 2 DUE TO ON BOARD PURCHASES 3. FAMILY ACCESSED AND 3 SPENT EARNINGS 4. EARNINGS WERE NOT 4 OR ONLY PARTIALLY TRANSFERRED 5 55. OTHER 5 7 77. DON'T KNOW 7 9 99. REFUSED 9
S4Q04AA_QUAL	• Was at least part of your pay dependent on how much the vessel caught (share catch)? • How are you paid (direct deposit, check, cash, or other methods)? ○ If direct deposit, was your pay sent to your bank account or to a family account? Please tell me more about that. (Ask whether the fisher has a bank account) • Were you able to access this money via an ATM? Were there any problems doing so? • Were your payments ever late? If yes, please explain.	
S4Q04A *(required)*	S4Q04A. Are you currently owed any unpaid earnings?	1 1. YES 2 2. NO 7 77. DON'T KNOW 7 9 99. REFUSED 9
S4Q04A_QUAL	• How much are you owed?	

Field	Question	Answer
	• Why weren't you paid? *Question relevant when: S4Q04A = 1*	
S4Q05 *(required)*	S4Q05. Did your earnings depend on a production quota/target?	1 1. YES 2 2. NO 7 7 7. DON'T KNOW 9 9 9. REFUSED
S4Q05_QUAL	• What is the quota or target? *Question relevant when: S4Q05 = 1*	
S4Q05B *(required)*	S4Q05B. Did you consider the quota/target to be a reasonable amount for one person working alone? *Question relevant when: S4Q05 = 1*	1 1. YES 2 2. NO 7 7 7. DON'T KNOW 9 9 9. REFUSED
S4Q05C *(required)*	S4Q05C. What would happen if you failed to meet the quota/target? INTERVIEWER: SELECT ALL THAT APPLY. ASK "Anything else?" AT LEAST TWICE BEFORE MOVING ON. PROBE FOR DETAILS. *Question relevant when: S4Q05 = 1*	1 1. THREATS OF OR SUBJECTION TO PHYSICAL VIOLENCE AGAINST RESPONDENT OR RESPONDENT'S FAMILY BY EMPLOYER/RECRUITER 2 2. RESTRICTION ON RESPONDENT'S MOVEMENT 3 3. DEBT BONDAGE OR MANIPULATION OF DEBT (DEBT TO EMPLOYER/RECRUITER) 4 4. LOSS OF WITHHELD WAGES 5 5. LOSS OF WITHHELD DOCUMENTS 7 7. LOSS OF HOUSING/LAND 9 9. DISMISSAL/SENT HOME OR THREATS OF 1 10. FINE OR DEDUCTION 0 FROM WAGES

Field	Question	Answer
		12. ABUSE OF ISOLATION 13. DEPRIVATION OF FOOD, WATER, SLEEP 14. VERBAL ABUSE 55. OTHER 66. NOTHING/EARN LESS MONEY/REPUTATION WOULD SUFFER 77. DON'T KNOW 99. REFUSED
SECTION 5: WORKING CONDITIONS *Group relevant when: CONSENT = 1 and (S1Q02 > 17 or S1Q02 = -76) and (S1Q01 = 1) and ELIGIBILITY_RETURN_DATE = 1*		
SECTION 5: WORKING CONDITIONS > HAZARDS		
S5Q02_revised1 *(required)*	**Did you work involve exposure to….** **Sharp or dangerous tools or machinery?**	1 1. YES 2 2. NO 7 77. DON'T KNOW 9 99. REFUSED
S5Q02_revised2 *(required)*	**Lifting heavy loads?**	1 1. YES 2 2. NO 7 77. DON'T KNOW 9 99. REFUSED
S5Q02_revised3 *(required)*	**Extreme heat or cold?**	1 1. YES 2 2. NO 7 77. DON'T KNOW 9 99. REFUSED
S5Q02_revised4 *(required)*	**Risk of falling from height?**	1 1. YES 2 2. NO

Field	Question	Answer
		77. DON'T KNOW 99. REFUSED
S5Q02_revised5 *(required)*	**Risk of drowning?**	1 1. YES 2 2. NO 77. DON'T KNOW 99. REFUSED
S5Q02_revised_oth *(required)*	**Anything else that risked your health or safety?**	
S5Q02A_QUAL	• IF RESPONDENT DESCRIBED ANY RISKS, ASK: Were these tasks clear to you before you started the job?	
S5Q03 *(required)*	S5Q03. Did your employer provide you with the personal protective equipment (PPE) needed to perform your job safely?	1 1. YES 2 2. NO 77. DON'T KNOW 99. REFUSED
S5Q04 *(required)*	S5Q04. I will read a list of protective gear. Please tell me which items you usually wore when working: INTERVIEWER: LISTEN AND SELECT ALL THAT APPLY. INCLUDE ALL PPE USED WHETHER PROVIDED BY EMPLOYER OR WORKER.	1 1. Protective goggles 2 2. Helmet 3 3. Ear-plugs 4 4. Respirator or dust-mask 5. Protective clothing such as coveralls 6 6. Gloves 7 7. Shoes / boots 8 8. Life jacket 55. Other 77. DON'T KNOW 99. REFUSED

Field	Question	Answer
S5Q05 *(required)*	S5Q05. Did your employer provide you with the training needed to perform your job safely?	1 1. YES 2 2. NO 7 77. DON'T KNOW 7 9 99. REFUSED 9
S5Q05_QUAL	• Did you receive any pre-departure training? • Where was it?	
S5Q06 *(required)*	S5Q06. Did your employer endanger your life by failing to take proper safety precautions?	1 1. YES 2 2. NO 7 77. DON'T KNOW 7 9 99. REFUSED 9
S5Q06_QUAL	• How was your life endangered? *Question relevant when: S5Q06 = 1*	
S5Q07 *(required)*	S5Q07. What would happen if you refused to do these hazardous activities? INTERVIEWER: SELECT ALL THAT APPLY. ASK "Any other consequence?" AT LEAST TWICE BEFORE MOVING ON. PROBE FOR DETAILS. *Question relevant when: S5Q03 = 2 or S5Q05 = 2 or S5Q06 = 1*	1 1. THREATS OF OR SUBJECTION TO PHYSICAL VIOLENCE AGAINST RESPONDENT OR RESPONDENT'S FAMILY BY EMPLOYER/RECRUITER 2 2. RESTRICTION ON RESPONDENT'S MOVEMENT 3 3. DEBT BONDAGE OR MANIPULATION OF DEBT (DEBT TO EMPLOYER/RECRUITER) 4 4. LOSS OF WITHHELD WAGES 5 5. LOSS OF WITHHELD DOCUMENTS 7 7. LOSS OF HOUSING/LAND 9 9. DISMISSAL/SENT HOME OR THREATS OF

Field	Question	Answer
		10. FINE OR DEDUCTION FROM WAGES 12. ABUSE OF ISOLATION 13. DEPRIVATION OF FOOD, WATER, SLEEP 14. VERBAL ABUSE 55. OTHER 66. NOTHING 77. DON'T KNOW 99. REFUSED
S5Q08 *(required)*	S5Q08. Did you get hurt or sick because of your work in this job during your last trip?	1. YES 2. NO 77. DON'T KNOW 99. REFUSED
S5Q08A *(required)*	S5Q08A. What types of injury or sickness, mental or physical, did you have? INTERVIEWER: LISTEN AND SELECT ALL THAT APPLY *Question relevant when: S5Q08 = 1*	1. HEAD INJURY 2. INJURY TO OR DEAFNESS IN EARS 3. EYE INJURY 4. INJURY TO SHOULDER 5. INJURY TO OR SWELLING IN HANDS 6. SMOKE, DUST, OR CHEMICAL DAMAGE TO LUNGS 7. INJURY TO ABDOMEN 8. BACK STRAIN/ PAIN IN BACK 9. INJURY TO KNEES OR LEGS

Field	Question	Answer
		10. TWISTED ANKLE 11. INJURY TO FEET 12. HEAT STROKE 13. BURN FROM FIRE 14. CHEMICAL BURN 15. CUTS/WOUNDS 16. SEASICKNESS 17. BERI BERI 18. DEPRESSION / MENTAL HEALTH ILLNESS 55. OTHER 77. DON'T KNOW 99. REFUSED
S5Q08B *(required)*	S5Q08B. How did you get hurt or sick? INTERVIEWER: LISTEN AND SELECT ALL THAT APPLY *Question relevant when: S5Q08 = 1*	1. SLIP/FALL 2. TOOL ACCIDENT 3. MACHINERY ACCIDENT 4. INHALATION OF DUST 5. VIOLENCE BY COWORKER/EMPLOYER 6. CARRYING HEAVY LOADS 7. EXHAUSTION 8. SOCIAL ISOLATION 55. OTHER 77. DON'T KNOW 99. REFUSED

Field	Question	Answer
S5Q08B_QUAL	• Were you provided timely and adequate health care to remedy your injury • Did your employer cover the costs of the medical care for your workplace injury? *Question relevant when: S5Q08 = 1*	
S5Q08B_QUAL2	• Do you know or have you seen other fishers with severe injuries, illness, or who died while on vessels?	
S5Q09 *(required)*	S5Q09. Did your employer require you to work when you were seriously sick or injured?	1 1. YES 2 2. NO 7 7 77. DON'T KNOW 9 9 99. REFUSED
S5Q09A *(required)*	S5Q09A. What would happen if you refused to work while sick or injured? INTERVIEWER: SELECT ALL THAT APPLY. ASK "Any other consequence?" AT LEAST TWICE BEFORE MOVING ON. *Question relevant when: S5Q09 = 1*	1 1. THREATS OF OR SUBJECTION TO PHYSICAL VIOLENCE AGAINST RESPONDENT OR RESPONDENT'S FAMILY BY EMPLOYER/RECRUITER 2 2. RESTRICTION ON RESPONDENT'S MOVEMENT 3 3. DEBT BONDAGE OR MANIPULATION OF DEBT (DEBT TO EMPLOYER/RECRUITER) 4 4. LOSS OF WITHHELD WAGES 5 5. LOSS OF WITHHELD DOCUMENTS 7 7. LOSS OF HOUSING/LAND 9 9. DISMISSAL/SENT HOME OR THREATS OF 10 10. DISPROPORTIONATE FINE OR DEDUCTION FROM WAGES

Field	Question	Answer
		12. ABUSE OF ISOLATION 13. DEPRIVATION OF FOOD, WATER, SLEEP 14. VERBAL ABUSE 55. OTHER 66. NOTHING 77. DON'T KNOW 99. REFUSED
S5Q10_QUAL	• How many hours did you work every day and week? • How many rest periods did you get in a day? ○ Did you always receive these rest periods? If not, why not? • How often did your work hours include nightwork?	
S5Q10 *(required)*	S5Q10. Did you regularly work more than 14 hours in a 24 hour period?	1. YES 2. NO 77. DON'T KNOW 99. REFUSED
S5Q11 *(required)*	S5Q11. What would happen if you refused to work over 14 hours per day? INTERVIEWER: SELECT ALL THAT APPLY. ASK "Anything else?" AT LEAST TWICE BEFORE MOVING ON. *Question relevant when: S5Q10 = 1*	1. THREATS OF OR SUBJECTION TO PHYSICAL VIOLENCE AGAINST RESPONDENT OR RESPONDENT'S FAMILY BY EMPLOYER/RECRUITER 2. RESTRICTION ON RESPONDENT'S MOVEMENT

Field	Question	Answer
		3. DEBT BONDAGE OR MANIPULATION OF DEBT (DEBT TO EMPLOYER/RECRUITER) 4. LOSS OF WITHHELD WAGES 5. LOSS OF WITHHELD DOCUMENTS 77. LOSS OF HOUSING/LAND 9. DISMISSAL/SENT HOME OR THREATS OF 10. FINE OR DEDUCTION FROM WAGES 12. ABUSE OF ISOLATION 13. DEPRIVATION OF FOOD, WATER, SLEEP 14. VERBAL ABUSE 55. OTHER 66. NOTHING/EARN LESS MONEY/REPUTATION WOULD SUFFER 77. DON'T KNOW 99. REFUSED
S5Q12 *(required)*	S5Q12. Were you required to work non-stop without breaks during the working day?	1. YES 2. NO 77. DON'T KNOW 99. REFUSED
S5Q12_QUAL	• Did your employer do anything to make you work harder or faster? Tell me more about that.	•
S5Q13 *(required)*	S5Q13.	1. YES 2. NO

Field	Question	Answer
	Could you raise concerns about your working conditions without fear of retaliation?	7 77. DON'T KNOW 7 9 99. REFUSED 9
S5Q13_QUAL	• Did you ever raise concerns? • About what? • With whom? • What happened next?	
S5Q14 *(required)*	S5Q14. Was there an agreed end date when you began working in this job?	1 1. YES 2 2. NO 7 77. DON'T KNOW 7 9 99. REFUSED 9
S5Q14A *(required)*	S5Q14A. Did you work beyond this agreed end date? *Question relevant when: S5Q14 = 1*	1 1. YES 2 2. NO 7 77. DON'T KNOW 7 9 99. REFUSED 9
S5Q14A_QUAL	• Why did you work beyond the agreed end date? *Question relevant when: S5Q14A = 1*	
S5Q14B *(required)*	S5Q14B. Did you agree to the change to the end date? *Question relevant when: S5Q14A = 1*	1 1. YES 2 2. NO 7 77. DON'T KNOW 7 9 99. REFUSED 9
S5Q14C *(required)*	S5Q14C. READ: Now I would like to ask you some questions about some of the challenges you or your co-workers may have experienced in this work. Did your employer ever threaten you with violence?	1 1. YES 2 2. NO 7 77. DON'T KNOW 7 9 99. REFUSED 9

Field	Question	Answer
S5Q14D *(required)*	S5Q14D. Was your employer ever physically violent to you?	1 1. YES 2 2. NO 7 7 77. DON'T KNOW 9 9 99. REFUSED
S5Q14D_QUAL	• Tell me more about threat or violence you experienced. *Question relevant when: S5Q14C = 1 or S5Q14D = 1*	
S5Q15 *(required)*	S5Q15. Did you feel like you could quit working on the vessel if you wanted to?	1 1. YES 2 2. NO 7 7 77. DON'T KNOW 9 9 99. REFUSED
S5Q15A *(required)*	S5Q15A. Why not? INTERVIEWER: SELECT ALL THAT APPLY. ASK "Anything else?" AT LEAST TWICE BEFORE MOVING ON. PROBE FOR DETAILS. *Question relevant when: S5Q15 = 2*	1 1. THREATS OF OR SUBJECTION TO PHYSICAL VIOLENCE AGAINST RESPONDENT OR RESPONDENT'S FAMILY BY EMPLOYER/RECRUITER 2 2. RESTRICTION ON RESPONDENT'S MOVEMENT 3 3. DEBT BONDAGE OR MANIPULATION OF DEBT (DEBT TO EMPLOYER/RECRUITER) 4 4. WITHHOLDING OF WAGES 5 5. WITHHOLDING OF VALUABLE DOCUMENTS/GUARANTEE 7 7. THREAT OF LOSS OF HOUSING/LAND 1 2 12. ABUSE OF ISOLATION 1 3 13. DEPRIVATION OF FOOD, WATER, SLEEP

Field	Question	Answer
		14. VERBAL ABUSE 55. OTHER 66. NO COERCION ("NEEDED JOB, COULDN'T QUIT") 77. DON'T KNOW 99. REFUSED
S5Q23 *(required)*	S5Q23. Do you have any photos of the vessel you worked on you could share with me?	1 1. YES 2 2. NO
SECTION 5: WORKING CONDITIONS > TAKE A PHOTO (1) *Group relevant when: S5Q23 = 1*		(Repeated group)
S5Q23_PHOTO *(required)*	TAKE A PHOTO	
S5Q24 *(required)*	S5Q24. It would be very helpful to see some documents from your job, for example your contract or a pay slip. Do you have any documents I could take a photograph of? We can cover up your name.	1 1. YES 2 2. NO
SECTION 5: WORKING CONDITIONS > TAKE A PHOTO (1) *Group relevant when: S5Q24 = 1*		(Repeated group)
S5Q24_PHOTO *(required)*	TAKE A PHOTO	
S5Q25 *(required)*	S5Q25. Do you plan to work on a foreign fishing vessel again?	1 1. YES 2 2. NO 77. DON'T KNOW 99. REFUSED
INTERVIEWER_NOTES	INTERVIEWER NOTES:	
SURVEY_END	END INTERVIEW Thank you very much for sharing your experience.	

Field	Question	Answer
	UNIQUE ID:	

SUPPLY CHAIN KEY INFORMANT INTERVIEW GUIDE

Introduction and Respondent Background:

1. Could you please tell us about yourself such as your job role and responsibilities?
    a. What type of experience do you have related to the distant water fishing industry? Could you please describe your experience?
    b. (PROBE FOR SPECIFIC KNOWLEDGE BASE AROUND DISTANT WATER FISHING SUPPLY CHAINS)
    c. We would like to know more about your knowledge and experience with the fishing industry in [COUNTRY] and in particular how distant water catch is part of this. Which of the following parts of the fishing industry are you most familiar with: [IF KEY INFORMANT IS NOT FAMILIAR WITH THESE TERMS, PLEASE USE EXAMPLES OF JOB TYPES FOR EACH CATEGORY]
        i. Fishing operations
        ii. Seafood processing
        iii. Marketing and sales
        iv. Environmental sustainability
        v. Traceability
        vi. Worker recruitment and placement
        vii. Fundamental human and workers' rights
        viii. Other parts? What is that? Could you explain more on this industry?
    d. (PROBE: Please explain FOR ALL INDICATED FAMILIARITIES)
    e. IF NOT, GO TO QUESTIONS ABOUT LABOR CONDITIONS
2. Can you describe your organization's work and what the main focus is? How does your organization/company connect to international fishing?
    a. As a [JOB ROLE] in the [INDUSTRY TYPE] industry, how does your [COMPANY/ORGANIZATION/EMPLOYER] interact with fishers or distant water fishing vessel fleets and downstream processing and sale through the global supply chain?
    b. (IF THE ORGANIZATION IS NOT DIRECTLY INVOLVED, ASK) If in your role as a [JOB TITLE] is not directly related, how do you interact with the distant water fishing industry in [COUNTRY]?

Global: Supply Chain Theme General:

1. We are seeking to better understand the distant water fishing industry's supply chain relationships in [COUNTRY]. Based on your experiences, ...
    a. (PROBE FOR SPECIFICS ON FISHING OPERATIONS, HARBOUR MANGAEMENT, PROCESSING FACILITIES, OWNERSHIP, AND FORMS IN WHICH SEAFOOD IS CONSUMED DOMESTICALLY OR EXPORTED)
    b. What are the key laws and regulations that govern the distant water fishing industry in [COUNTRY]?
        i. (PROBE FOR SPECIFIC ECONOMIC AND LABOR LAWS)
2. Could you share with us about information sources you use or have heard about that is used to document and map ports, contain information about shipping vessels, companies, ship captains, and/or processing facilities involved in the distant water fishing industry?
    a. Which sources do you consider to be the most reliable? The least reliable?

    b. Which combination of data sources do you think would provide the most accurate and complete of the distant water fishing industry generally, and to [insert focus based on labor findings] in particular?
3. Who are the major stakeholders and influencers in the distant water fishing industry in [COUNTRY] (ex: local and international NGOs, trade associations, informal business networks, owners, buyers, traders, traders, foreign investors, labor unions, and local Civil Society Organizations (CSOs))?
    a. (PROBE FOR SPECIFICS RELATED TO THE DISTANT WATER FISHING INDUSTRY)
4. What species are you familiar with? Please describe the production process of [SPECIES] from the beginning to the end.
    a. How are these goods transported or traded? What are the downstream products and end uses of this seafood. (PROBE FOR PARTS, AKA BONES, SKIN, MEAT, OIL, ETC)
    b. (PROBE TO SEE IF THE RESPONDENT CAN EXPLAIN THE PRODUCTION PROCESS OF SEVERAL TYPES OF CATCH)
5. Can you describe the role of intermediate transfer vessels (mother ships) in the global distant water fishing industry? How is seafood transferred on these vessels documented and traced? Can you describe co-mingling of seafood caught on vessels and downstream traceability issues? What are the challenges to traceability following co-minging of catches?
6. Can you describe illegal fishing practices in the global distant water fishing industry? What do you see as the largest challenge? How would you describe the actors that fish illegally? What impact does this have on supply chain traceability and labor conditions on vessels?
7. How have current or former domestic trade policies in [COUNTRY] and international pressures impacted the fishing sector?
    a. (PROBE FOR SPECIFICS ON: FISHING VESSELS, ONSHORE PROCESSING FACILITIES, LABOR LAWS)
8. How might one track seafood caught at a particular vessel through the domestic supply chain?
    a. (PROBE FOR SPECIFICS BASED ON THE MAIN TARGET SPECIES, E.G. TUNA, SQUID, ETC.))
    b. Is there a point in the supply chain where you anticipate tracking would no longer be possible? (PROBE FOR SPECIFICS ON WHAT STAKEHOLDER THE TRACEABILITY ENDS WITH, EX: INTERMEDIARY BUYER, EXPORTER, ETC.)
    c. When does the co-mingling of seafood from different vessels occur, and how does mixing occur?

In-country: Domestic Mapping and Direct Tracing (anticipated destination markets: China, Taiwan, Argentina, Fiji. Final points to be identified through worker surveys)

1. Can you give me an overview of how the seafood processing industry works in [country of unlading]?
    a. What are the key laws and regulations that govern the operations of the distant water fishing industry and the import of seafood catch from foreign vessels? (PROBE FOR SPECIFIC LAWS AND REGULATIONS)
    b. Is there a special economic zone, free trade zone, export processing zone, etc. for seafood?
    c. Is the processing caught by domestic vessels similar or different than seafood procured by foreign flagged vessels?

2. Is the seafood caught on distant water fishing vessels [identified in this study as having evidence of indicators of FL] unladed in [COUNTRY] consumed domestically, (either directly by individual consumers or used in the seafood processing industry)?
    a. What percentage of fish is consumed domestically? Is there a government agency or trade association that publishes industry statistics on consumption and/or production?
    b. What are the major downstream goods produced domestically using seafood caught in vessels for which this study found indicators of forced labor]?
        i. (PROBE FOR ALL DOWNSTREAM PRODUCTS PRODUCED OR (DOMESTIC USE OR EXPORT) - BASED ON SPECIFIC DOWNSTREAM GOODS IDENTIFIED PREVIOUSLY BY RESPONDENT AND/OR KNOWN TO ENNUMERATOR THROUGH SECONDARY LITERATURE REVIEW)
3. (What major corporations, multi-national (foreign and domestic) are prominent in the domestic seafood industry [in country of seafood unlading]?
    a. PROBE FOR SPECIFICS ON: FISHING VESSELS, TRANSFER VESSELS, ONSHORE PROCESSING FACILITIES
    b. After unlading of seafood in port, what domestic processing [of subject species] occurs? How are these goods transported or traded? Who are the primary actors? Can you describe the marketing channel for seafood unloaded from foreign vessels (contracts, sale price, frequency of sales, etc.)?
    c. Are these primary, intermediate, byproducts or downstream goods consumed domestically or exported?
        i. Is there a government agency or trade association that quantifies volumes of seafood at each processing stage?
        ii. Is there a single source that identifies all distant water fishing vessels in [country of unlading]'s waters and/or ports? As well as the volume and value of seafood catches
        iii. If the list is publicly available, what organization publishes the list?
            1. Would you consider this list, and any record of catches unloaded in port, to be an accurate reflection of the economic activity of the vessel? If not, why?

        Are there any lists or mapping of fish processing facilities in [COUNTRY of unlading] If so, how would someone access the list?

    d. What domestic industries or companies use [INDICATED SPECIES] from distant water fishing as a material inputs?
        i. (PROBE ALL GOOD OPTIONS THAT HAVE ALREADY BEEN MENTIONED BY THE RESPONDENT)
            1. What do the domestic industries and companies use [SPECIES] as an input for?
            2. (PROBE ALL GOOD OPTIONS THAT HAVE ALREADY BEEN MENTIONED BY THE RESPONDENT)
        ii. How have current or former domestic trade policies and international pressures impacted the fishing sector?
    e. (PROBE FOR SPECIFICS ON: FISHING VESSELS, ONSHORE PROCESSING FACILITIES, LABOR LAWS)
        i. Have there been any socio-political events that have impacted the distant water fishing supply chain? If yes, such as? How?

ii. Have there been changes in policies or efforts from the Government of [COUNTRY] that have impacted the supply chain? If so, please explain.
iii. What can you tell us about the labor standards in the distant water fishing industry?

f. What are the primary concerns across the industry when it comes to labor standards?
g. What are the different certifications available for companies in the supply chain?
    i. Is it common for companies to have these certifications (PROBE FOR SPECIFICS)
h. Are there children working across the industry, if so, in which parts and how old are the children? (PROBE FOR SPECIFICS: Migrant children, boys or girls, are they in or out of school?)
i. (PROBE FOR SPECIFICS ON: FISHING VESSELS, HARBORS, PROCESSING FACILITIES)
    i. Do you know any projects trying to trace fish products in [country], regionally or globally? If so, explain about it?
    ii. (Probe for specifics on what the initiatives are and who is promoting them (e.g. government, international corporations, domestic companies)

4. Who are the major stakeholders and influencers in the distant water fishing industry (ex: local and international NGOs, trade associations, informal business networks, owners, buyers, traders, government agencies, and foreign investors)?

Supply Chain Labor Exploitation Questions (for supply chain experts, interviewer will ask a few labor specific questions during or at the end of the interview):

1. What is your overall impression of working conditions in the distant water fishing industry?

    a. What labor issues do fishers face (i.e. withheld wages, hours violations, lack of access to adequate health care, etc.)? What are the most serious issues? (PROBE FOR SPECIFIC ILO INDICATORS OF FORCED LABOR IDENTIFIED IN WORKER SURVEY)

    b. What factors make a fisher in this sector vulnerable to forced labor?
        i. (PROBE FOR SPECIFICS ON DEMOGRAPHICS – AGE RANGE, GENDER, MIGRATORY STATUS such as legal, illegal, country of origin, language skills, etc.)
    c. Are you aware of any situations in which fishers are working on an involuntary basis or are otherwise unable to leave their jobs?
2. During which stages of the distant water fishing supply chain are risks for forced labor most prevalent?
    a. What are the risk factors at each stage (particularly at sea and transshipment?
        i. PROBE FOR SIMILARITIES AND DIFFERENCES
3. If there are concerns of forced labor, who are the main stakeholders in the distant water fishing industry you know or believe to be involved in the sale and processing of seafood obtained using forced labor?
4. What are the root causes and social drivers that lead to forced labor on distant water fishing vessels?
5. Do worker recruitment agencies provide any information or remediation for fishers abroad?

6. To the extent that grievance procedures are available to fishers working on distant water vessels, what mechanisms are available for submitting grievances?
    a. Who tracks or follows up on any issues that are reported?
    b. Are you aware of any efforts by government entities, international organizations, or others to improve labor conditions in the distant water fishing industry?
    c. Do existing grievance mechanisms help us to better understand what seafood is at high risk of being caught with forced labor? Why or why not? (PROBE FOR CHALLENGES AND LIMITATIONS)
7. Of the major actors in the distant water fishing supply chain such as shipping vessels, port operators, traders, seafood buyers, seafood downstream processors, etc., which stakeholder(s) wields the most influence over labor conditions on distant water fishing vessels?

Conclusion

1. Could you suggest any organizations or individuals that are well informed about the distant water fishing supply chain that we could interview? Why should we interview them?
2. Are there any data sources or specific reports that you think would be helpful for our study?
3. Is there anything else you would like to add?

LABOR EXPERT KEY INFORMANT INTERVIEW GUIDE

Introduction and Respondent Background:

1. Could you please tell us about yourself such as your job role and responsibilities?
    a. What type of experience do you have related to the distant water fishing industry? Could you please describe your experience?
    b. (PROBE FOR SPECIFIC KNOWLEDGE BASE AROUND DISTANT WATER FISHING SUPPLY CHAINS)
    c. We would like to know more about your knowledge and experience with the fishing industry in [COUNTRY] and in particular how distant water catch is part of this. Which of the following parts of the fishing industry are you most familiar with: [IF KEY INFORMANT IS NOT FAMILIAR WITH THESE TERMS, PLEASE USE EXAMPLES OF JOB TYPES FOR EACH CATEGORY]
        i. Fishing operations
        ii. Seafood processing
        iii. Marketing and sales
        iv. Environmental sustainability
        v. Traceability
        vi. Worker recruitment and placement
        vii. Fundamental human and workers' rights
        viii. Other parts? What is that? Could you explain more on this industry?
    d. (PROBE: Please explain FOR ALL INDICATED FAMILIARITIES)
    e. IF NOT, GO TO QUESTIONS ABOUT LABOR CONDITIONS
2. Can you describe your organization's work and what the main focus is? How does your organization/company connect to international fishing?
    a. As a [JOB ROLE] in the [INDUSTRY TYPE] industry, how does your [COMPANY/ORGANIZATION/EMPLOYER] interact with fishers or distant water fishing vessel fleets and downstream processing and sale through the global supply chain?
    b. (IF THE ORGANIZATION IS NOT DIRECTLY INVOLVED, ASK) If in your role as a [JOB TITLE] is not directly related, how do you interact with the distant water fishing industry in [COUNTRY]?

Labor Conditions Section

1. Does your organization work on issues related to the distant water fishing industry?
    a. If yes, please explain.
    b. IF NOT, how familiar are you with issues concerning the distant water fishing industry?

Forced Labor Questions

1. What is your overall impression of working conditions in the distant water fishing industry?
    a. What are the main issue areas you are aware of?
    b. What factors make (migrant) fishers in this sector more vulnerable to forced labor?
        i. (PROBE FOR SPECIFICS ON DEMOGRAPHICS – AGE RANGE, GENDER, MIGRATORY STATUS-legal/illegal, border pass, etc.

2. Can you describe the power dynamics of fisher-employer relations in the distant water fishing industry?

Recruitment

1. From your understanding, how are individuals recruited to work in the distant water fishing industry?
2. If an individual uses a manning recruitment agency, do they incur recruitment fees for job placement on a vessel? If so, how much did they pay?
    a. (PROBE AS RELEVANT): Do all fishers gain employment through manning agencies? If not, why?
    b. What other ways do they gain employment?
    c. Do most fishers have legal work permits? If not, why?
    d. Based on your understanding/experience, are third party recruiters used in recruitment for the industry? Are these recruiters here in [COUNTRY] or in another country?
        i. PROBE: IF YES, (REQUEST DETAILS, SUCH AS WHO PAYS THE RECRUITER AND NAME OF RECRUITER) Can you describe the relationship between the manning agent and the fishing company?
    e. Is it usual that they gain employment directly with the fishing company or through an employment agency? If they do not use a manning agent, what is the recruitment system?
    f. What are the specific recruitment methods used by manning agents and do they differ among types of employers? For example, word of mouth, social media posts, etc.
    g. What about recruitment through friends or family? How?
        i. How much are typical recruitment fees? How long does it take a fisher to pay the fees off?
        ii. Who are the fees allocated among?
2. Do fishers in the distant water fishing industry typically have a contract?
3. Are contracts usually verbal or written?
    a. If written, do fishers usually understand the contents of the contract? (PROBE: WRITTEN IN A LANGUAGE THE FISHER CAN UNDERSTAND; FISHER IS LITERATE OR ALLOWED TO HAVE SOMEONE READ IT; FISHER IS GIVEN SUFFICIENT TIME TO EXAMINE THE CONTRACT)
4. Are you aware of any reports of anyone being sold or taken by force to work on the fishing vessels?
5. Where are the fishers from in the [COUNTRY] distant water fishing fleet that you are familiar with? From which countries; do you know their ethnic background?
6. What about the employment of women on distant water fishing vessels? Can you describe the terms of employment? (full/part time, working hours, benefits, leaves, etc.)
    a. What kinds of promises are typically made to fishers regarding working and living conditions and benefits? Does this differ for men and women?
    b. Are these promises/agreements fulfilled? Does this differ for men and women?
    c. Can you think of any form of deception that may be practiced during the recruitment phase? Does this differ for men and women? Explain
7. Do you know the nationalities of fishers employed on distant water fishing vessels?

Can you describe the treatment of fishers of different nationalities by captains or skippers? (PROBE: Request details, were fishers working on vessels under their free will or being forced through a state-sponsored labor program?)

1. In your experience, what are the key issues that fishers face in terms of their wages and benefits?
    a. Do fishers get paid regularly and on time? How and how often are they paid?
    b. Do fishers encounter situations of withheld wages or wage deductions? How much are the withholdings or deductions?
    c. How much are fishers typically paid? (Do all types of work receive more or less the same or are there differences)
2. Who actually makes the payment and in what form?
    a. Do all fishers have ATM cards? Are there problems in using these cards?
    b. Are fishers let go (fired) without receiving their due wages? In what situations?
3. How many hours does a fisher typically work? Are they paid for all hours worked?
    a. How often do employees work overtime or past their agreed hours?
    b. What happens to a fisher if they refuse to work overtime or past their agreed hours?
    c. Are fishers paid the legally required overtime rate? (If applicable)
    d. Are they required to work on call?
    e. What would happen if they refused?

Vessel-Specific Questions:

1. Do fishers ever receive a proportion of the profits from the catch?
   If yes, how do they receive the contribution? What are the justifications of the contribution?

Working Conditions, Hazardous Work, and Coercion:

1. What are the main risk factors for labor exploitation in the distant water fishing industry?
    a. In what segments of the industry and its supply chain is exploitation most visible?
    b. Are you aware of specific companies and/or production sites throughout the supply chain that are particularly exploitative?
2. What are the most common hazards fishers face in the distant water fishing sector?
    a. Do fishers consent to do this work? What would happen if they refused?
3. In your understanding, are there sufficient health and safety standards in place in the distant water fishing sector?
    a. Please explain.
4. Is it common to hear of or witness coercion or threats from employers toward fishers in the fishing sector?
    a. Are any subgroups of fishers more vulnerable to abuse? IF SO, who? (MEN? WOMEN? SPECIFIC NATIONALITIES?
        i. Could you give me a sense of the percentage of fishers who experience this?

5. Can fishers in the fishing sector leave their jobs if they choose?
    a. IF NOT, why / in what situations? (PROBE ABOUT FISHERS IN DEBT)
    b. Do fishers who leave or attempt to leave their job face any consequences?
    c. Do the fishers/onshore fishers have access to their identity documents?

d. Does this impact their ability to leave their job?

Vessel-Specific Questions:

1. Have you heard of situations where vessel captains threaten, beat, and drug fishers to work longer and sell fishermen drugs as a means to generate additional debt?
    a. Please explain.
2. If fishers fall sick on the vessels, what happens? In the case of a death on the vessel, what happens?
3. What happens when a fisher goes missing?

Surveillance and Living Conditions (if applicable)

1. What kind of involvement do employers have in fishers' lives outside of work?
2. How do fishers access goods and services to meet their basic needs? (PROBE FOR DIFFERENCES WHEN FISHER IS AT SEA AND ON SHORE)
    a. Where do fishers buy food, clothing, and health services?
        i. Are fishers reliant on employers for these items? How often?
        ii. Are these items ever bought on credit? Under what conditions?
        iii. How do they receive healthcare services when they get sick or injured?
3. Do employers monitor / limit the communications of their fishers? IF SO, how?
4. Are fishers able to leave their workplaces freely or if they request to leave (i.e. for an appointment, family emergency, etc.).
    a. Are you aware of fishers being locked in or under guard while working?
5. Can you describe the living conditions on the vessels?
    a. Are there fees or any costs associated with living on the vessel?
    b. Do employers monitor / limit the communications of their fishers? IF SO, how?
    c. When distant water fishing vessels dock at a port that is not the home country of its fishers, are fishers allowed to leave the vessel?
    d. Are fishers given access to wi-fi or telecommunications to speak to family and friends? If so, when and for how long are they allowed to use such communications?

Grievance Procedures and Industry/Government Initiatives:

1. In your experience, what understanding do fishers in the distant water fishing industry typically have of their rights?
    a. What are the areas of their rights in which fisher awareness is low?
2. What mechanisms are available for submitting grievances?
    a. Have you heard of or observed any retaliation for submission of grievances?
    b. Do fishers encounter any barriers in submitting grievances?
    c. In cases where fishers submit a grievance, where do they normally submit it? For example, is it when they return to their home country, at a port stopover, while on the vessel, etc.?
3. Are you aware of any efforts by government entities or others to improve labor conditions in the fishing industry?
    a. IF SO, please explain.

b. In your opinion, are there key gaps in domestic policy and practice from the government and/or industry in terms of fishers' rights and working conditions? Please explain.

Vessel-Specific Industry and Government Initiatives:

1. How well do you believe that agreements between [country of seafood unlading] and [country of vessel flagging] help protect migrant fishers?
    a. Where do you see gaps in those bilateral agreements that could be/are being exploited?
    b. What more do the [countries] governments need to do to ensure that the bilateral agreements are fully implemented?
2. How well do you believe that industry initiatives (e.g. Fishery Improvement Projects, certifications, due diligence processes) help protect migrant fishers from labor abuses?
    a. What particular initiatives stand out, and what are their main challenges?
    b. What would be needed to scale up those initiatives?

Conclusion:

1. As per your roles, what did your organization support to resolve the above-mentioned issues? What were the results of the support?
2. Could you suggest any organizations or individuals that are well informed about the fishing sector supply chain or child labor in the industry that we could interview?
    a. What about any publicly available industry reports/publications?
3. Is there anything else you would like to add?

APPENDIX 7: INDICATOR AND QUESTION MAPPING

Forced labor occurs if there is both involuntary work and coercion at any of the 3 stages:		
Recruitment stage		
Category of indicator	**Indicator**	**Indicator present if…**
Involuntary work	Forced recruitment	S2Q02=2 & S2Q02A = 1, 2, 3, 5, or 7
	Deceptive or fraudulent recruitment	S2Q04A=1, 3, 4, 5, 6, 7, 8, 9, or 10*
	Recruitment linked to debt	S2Q01AA5=1*
Coercion	Physical or sexual violence	S2Q02A=1 or S2Q04B=1* or S2Q04B=13*
	Restrictions on workers' movement	S2Q02A=2 or S2Q04B=2*
	Abuse or manipulation of debt	S2Q02A=3 or S2Q04B=3* or excessive recruitment fees, defined as more than 1 month pay (based on transcript review)
	Retention of cash, assets, or identity documents	S2Q01A=1* or S2Q02A=5 or S2Q04B=5*
	Loss of housing/land provided by employer	S2Q02A=7 or S2Q04B=7*
	Dismissal	S2Q04B=9*
	Abuse of isolation	S2Q04B=12*
Employment stage		
Category of indicator	**Indicator**	**Indicator present if…**
Involuntary work	Recruitment linked to debt	S2Q01AA5=1*
	Hazardous or degrading working conditions	S5Q03=2 or S5Q05=2 or S5Q06=1 or S5Q09=1 or S2Q04B=14* or S4Q05C=14 or S5Q07=14 or S5Q09A=14 or 5Q11=14 or S5Q15A=14
	Onerous working hours or work schedule	S5Q10=1 or S5Q12=1
	Degrading work-related living conditions	(S3Q02A=2) + (S3Q02B=1) + (S3Q02C=3) + (S3Q02D=3) + (S3Q02E=1) + (S3Q02F=2) + (S3Q02G=2) >=2
	Low or no wages	1 month+ unpaid earnings or underpayment because of catch or boat problems (based on transcript review)
Coercion	Physical or sexual violence	S4Q05C=1 or S5Q07=1* or S5Q09A=1 or S5Q11=1* or S4Q05C=13 or S5Q07=13 or S5Q09A=13 or S5Q11=13 or S5Q14C=1 or S5Q14D=1
	Restrictions on workers' movement	S4Q05C=2 or S5Q07=2 or S5Q09A=2 or S5Q11=2 or S3Q03=1 or S3Q03B=4* or (S3Q04=1, 3, 4, or 5*)
	Abuse or manipulation of debt	S4Q05C=3 or S5Q07=3 or S5Q09A=3 or S5Q11=3 or excessive recruitment fees, defined as more than 1 month pay (based on transcript review) or S4Q01A=1 or S4Q01B=1 or S4Q01C=1
	Withholding of wages	S4Q05C=4 or S5Q07=4 or S5Q09A=4 or S5Q11=4
	Retention of cash, assets, or identity documents	S2Q01A=1* or S4Q05C=5 or S5Q07=5 or S5Q09A=5 or S5Q11=5 or S3Q05AA=2*

Forced labor occurs if there is both involuntary work and coercion at any of the 3 stages:		
	Loss of housing/land provided by employer	S4Q05C=7 or S5Q07=7 or S5Q09A=7 or S5Q11=7
	Dismissal	S4Q05C=9 or S5Q07=9 or S5Q09A=9 or S5Q11=9
	Abuse of isolation	S4Q05C=12 or S5Q07=12 or S5Q09A=12 or S5Q11=12 or (S3Q03A=3 or 4)
Employment separation stage		
Category of indicator	**Indicator**	**Indicator present if…**
Involuntary work	Inability to terminate employment	S5Q14B=2* or S2Q01A=1* or S4Q01D=1 or S5Q15A=1, 2, 3, 4, 5, 7, 12, 13, 15, or 17*
Coercion	Physical or sexual violence	S5Q15A=1* or S5Q15A=13*
	Restrictions on workers' movement	S5Q15A=2*
	Abuse or manipulation of debt	S4Q01D=1 or S5Q15A=3*
	Withholding of wages	S5Q15A=4*
	Retention of cash, assets, or identity documents	S2Q01A=1* or S5Q15A=5*
	Threat of loss of housing/land provided by employer	S5Q15A=7*
	Abuse of isolation	S5Q15A=12*

*Variable recoded based on transcript of interview