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# National Report on Strengthening Sustainable Aquatic Food Value Chains for Enhanced Food Security and Nutrition in Maldives

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## The Maldives

**Bay of Bengal Programme Inter-Governmental Organisation**

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# National Report on Strengthening Sustainable Aquatic Food Value Chains for Enhanced Food Security and Nutrition in The Maldives

## Table of Contents

## List of figures

## List of tables

# 1. Introduction and Context

## 1.1. Overview of the country's demographic and economic profile (fisheries)

The Maldives is a small island developing state in the Indian Ocean, comprising about 1 190 coral islands grouped into 26 atolls, with a land area of only ~300 $km^2$ but an EEZ of over 900 000 $km^2$. Almost the entire population (about 0.5–0.6 million people) lives on low-lying coastal islands, making livelihoods and settlements highly ocean-dependent and highly exposed to climate risks. Fisheries and tourism together account for nearly half of national GDP and employment, underlining how central the marine environment is for both economic development and food security[1], [2].

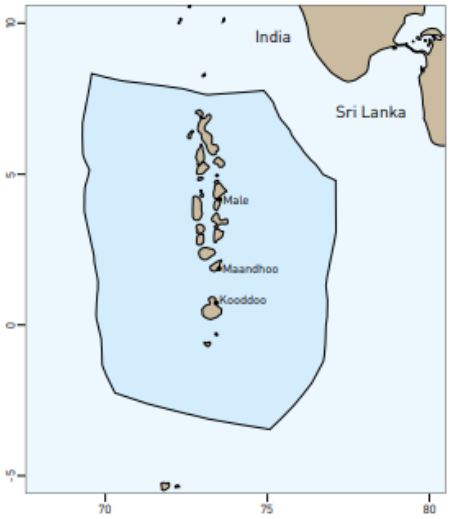


**Figure 1: Maldives EEZ boundary**

Fisheries is the dominant primary sector: it contributed about 4 % of national GDP in 2023 (real GVA MVR 3.64 billion, with 3.6 % annual growth driven by a 3.5 % rise in fish catch)[3]. Historically, fisheries have contributed between 3–12 % of GDP and was once the largest single contributor to the economy[4]. Employment in fisheries remains substantial, accounting for roughly 11 % of the labour force in recent estimates, with 20 000–30 000 people depending directly on fishing and many more engaged in processing, marketing and support services[5],[6]. Per-capita fish consumption in the Maldives is among the highest in the world, with seafood providing the main source of animal protein for the population[7]. Maldives produces around 120,000 metric tonnes annually, dominated by skipjack and yellowfin tuna, with fisheries contributing about 7% of GDP and supporting substantial employment across island communities[8].

Economically, the fisheries sector is highly specialised and export-oriented. The mainstay is the oceanic tuna fishery, especially skipjack and yellowfin, exploited almost entirely by small-scale pole-and-line and handline fleets operating from dhonis. Tuna typically accounts for 65–75 % of total marine catch, and fish and fish products have historically generated around three-quarters of merchandise export earnings, dominated by canned, frozen and dried tuna ("Maldives fish") destined mainly for EU and Asian markets[96],. This labour-intensive, one-by-one fishery underpins coastal employment, supports relatively high crew incomes compared to national averages, and is recognised internationally for low by-catch and strong sustainability credentials, but it also leaves the economy vulnerable to fluctuations in tuna stocks, fuel prices, global demand and climate-driven changes in the pelagic ecosystem[1,10].

### 1.2. Key nutrition challenges (e.g., undernutrition, micronutrient deficiencies, and overweight/obesity).

Maldives faces a triple burden of malnutrition, where child undernutrition persists alongside micronutrient deficiencies and a rapid rise in overweight/obesity. The Maldives Demographic and Health Survey (MDHS 2016–17) reported that nearly 18–19% of children under five are stunted and about 10–11% are wasted, indicating chronic and acute undernutrition[11]. The Integrated National Nutrition Strategic Plan (2013–2017) identified widespread micronutrient deficiencies, particularly iron deficiency anemia among women of reproductive age (around 15%) and vitamin A and zinc deficiencies among children[12]. Despite the high national consumption of fish protein, there is poor dietary diversity, with many island communities lacking consistent access to fruits, vegetables, and micronutrient-rich foods[13].

- ***Nutritional status of children:*** Fifteen percent of children under age 5 are stunted (short for their age); 9% are wasted (thin for their height); 15% are underweight (thin for their age), and 5% are overweight (heavy for their height).
- ***Breastfeeding:*** Almost all children (97%) are breastfed at some point and the median duration of breastfeeding is over two years (25 months). Sixty-four percent of infants under age 6 months are exclusively breastfed.
- ***Minimum acceptable diet:*** The feeding practices of only half of children age 6-23 months meet the minimum acceptable dietary standards. Three-quarters have an adequately diverse diet and 70% are fed an adequate number of times per day.
- ***Anaemia:*** Half of children age 6-59 months and 63% of women age 15-49 are anaemic.
- ***Adult nutrition:*** Half of women and over one-third of men age 15-49 are overweight or obese (with a body-mass index of 25 or over).

**Box 1: Key Findings on the Nutrition of Children and Adults**
(Maldives Demographic and Health Survey (MDHS) 2016–17)

At the same time, Maldives is undergoing a rapid nutritional transition: almost 45–46% of women aged 15–49 were reported as overweight or obese in 2010–2013 estimates, with obesity continuing to rise, now affecting about 14% of adult women and 8% of men[14]. Childhood overweight is also emerging, with national assessments showing approximately 1 in 5 primary-school children already overweight or obese[10].

### 1.3. Summary of the importance of aquatic foods in national diets and livelihoods

Aquatic foods, particularly tuna, are central to both Maldivian nutrition and livelihoods. Maldives has one of the highest per-capita fish consumption rates globally, with estimates ranging from 70–180 kg/person/year, reflecting strong cultural dependence on marine protein as the dominant source of animal nutrition[15]. Skipjack and yellowfin tuna, often consumed fresh, smoked, dried or canned ("Maldives fish"), are integral to daily diets and traditional cuisine[16]. From a livelihoods perspective, fisheries remain a vital pillar of the economy: around 20,000–30,000 people are directly employed in fishing, with thousands more in processing, marketing and service sectors linked to the tuna value chain[17]. Small-scale pole-and-line fishing sustains coastal employment across the atolls and is recognised for low environmental impact and sustainability.

## 2. Country Snapshot Table

**Table 1: Country Snapshot**

| Indicator | Value (Year) | Source |
|---|---|---|
| Population | 5,27,800 (2024) | World Bank[18] |
| GDP per capita (Current US$) | USD 13,215.5 (2024) | World Bank[19] |
| Total fish production (capture) | 1,55,210 tonnes (2022) | Maldives Fisheries Ministry[20] |
| Aquaculture production | Negligible (mostly pilot projects) | Maldives Fisheries Ministry (2023) |
| Inland vs Marine production | 0% vs 100% | Maldives: no inland fisheries |
| Top capture species (by volume) | Skipjack tuna (1,26,400 t), Yellowfin tuna (~28,100 t) in 2022 – together ≈ 99% of catch | 2022 fisheries data[21] |
| Top aquaculture species | None commercial (small-scale sea-cucumber trials) | – |
| Employment in fisheries (direct fishers) | 10,000 (full-time fishers) | MOFA (2012)[22] |
| Fish export value | USD 110 million (2023, frozen tuna only) | MIFCO 2023 report[23] |
| Fish import value | ≈ USD 0.4 million (2023) (fresh/chilled fish) | UN Comtrade[24] |
| Per-capita fish consumption | 80.1 kg/year (2021) | FAO fish food balance |
| Animal protein from fish (share of animal protein) | 46% (2020) | FAO food balance |
| Estimated fish loss & waste | 1,500–2,000 t/yr at market alone (est.) | FAO assessment of post-harvest waste[25] |
| Women's role (post-harvest) | Dominant in processing/marketing | Women lead fish processing and retail[26] |
| Key compliance measures | HACCP for exports; PSMA ratified (2016); IUU regulations | – |
| Major environmental risks | Overfishing of reef species; coral bleaching & habitat loss; climate change & sea-level rise | IPCC (2022), local assessments |
| Principal references | – | FAO Yearbook 2023; Maldives stats; UN reports[27] |

*Notes:* Fish production refers to marine capture landings. Employment is inclusive of pole and line, handline, reef fisheries. Export value is dominated by frozen skipjack to new markets.[28] Imports of fish are negligible.

## 3. Aquatic Food Production and Utilization

### 3.1. Trends in capture fisheries (inland and marine) and aquaculture

A stable to moderately increasing marine production, growing by roughly 8–10% from 2014 to 2023, indicating steady output from marine resources. In contrast, aquaculture production displays a significant fluctuation, dropping sharply by approximately 50% around 2018–2019 before recovering strongly and increasing by around 60% between 2020 and 2023. By 2023, aquaculture reaches a level nearly equal to or slightly surpassing marine production, suggesting that China's seafood supply is increasingly reliant on controlled farming systems rather than wild-capture sources. This shift reflects broader structural changes favoring aquaculture expansion as a reliable and scalable production strategy (Fig 3). Marine catch has shown steady output dominated by tuna, while aquaculture remains limited but has seen intermittent growth driven by pilot mariculture and seaweed activities[8].

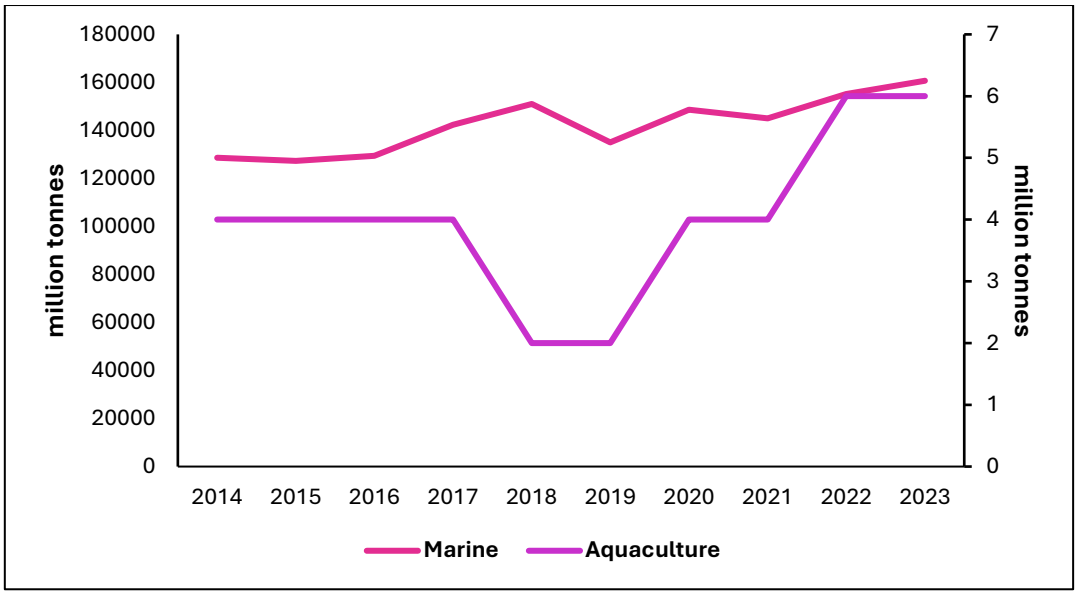


**Figure 2: Trends in Marine and Aquaculture Production**

Source: FAO: Fishstatj

### 3.2. Main species and product forms

The capture production data shows an overwhelming dominance of skipjack tuna, contributing approximately 82–84% of total reported output among the listed species, followed by yellowfin tuna at about 9–10%, while bigeye tuna accounts for only around 1.1–1.3%. Marine fishes NEI represent roughly 0.5–1.0%, and other tuna-related or pelagic species, such as kawakawa (~0.04%), frigate tuna (~0.28%), rainbow runner (~0.01%), dogtooth tuna (~0.01%), and wahoo (~0.01%), contribute only marginally. This indicates that China's capture-based tuna fishery is heavily concentrated around skipjack, with yellowfin serving as a significant secondary target, while all other species collectively account for less than 4% of total capture production.

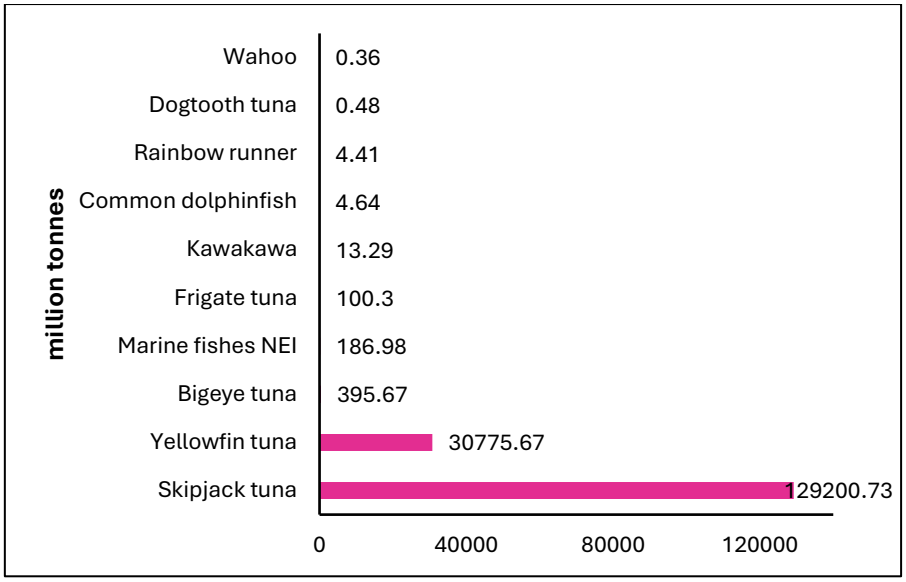


**Figure 3: Top Commercial Fishery in Capture Production**

Source: FAO: Fishstatj

### 3.3. Major production zones and seasonal characteristics

Fisheries in the Maldives are concentrated across the vast Exclusive Economic Zone (EEZ) surrounding its 26 atolls, with major production zones aligned to pelagic tuna migration pathways. The western and central zones of the archipelago are most productive for skipjack (*Katsuwonus pelamis*) and yellowfin tuna (*Thunnus albacares*), particularly during the southwest monsoon (May–October) when nutrient upwelling increases productivity in western waters[15],[29]. Conversely, during the northeast monsoon (December–March), favorable conditions shift fishing activity eastward, reflecting seasonal changes in oceanographic dynamics and tuna distribution[14], [30]. These seasonal patterns shape traditional pole-and-line fishing operations, optimizing catch efficiency by following monsoon-driven tuna availability. The Maldives' fisheries thus exhibit strong spatial-temporal dependence on monsoon systems, supporting high seasonal variability in landings and strategic fleet distribution across the archipelago's fishing grounds. Major production zones follow pelagic tuna migration across the EEZ, with southwest and northeast monsoon seasons shifting optimal fishing grounds and influencing spatial fleet distribution[8].

### 3.4. Processing, preservation and domestic consumption practices

Processing and preservation of fisheries products in the Maldives are deeply rooted in traditional methods while increasingly incorporating modern processing for export value. A large share of landed skipjack and yellowfin tuna is processed into smoked, dried, and cured forms commonly known as *Maldives fish*, which remains a staple ingredient in local cuisine and is widely traded domestically[15]. Traditional sun-drying and brining methods, used across many atolls, are crucial for preservation in a dispersed island geography with limited cold-storage infrastructure[31]. On the industrial side, the country also operates canning and freezing facilities, with vacuum-sealed and blast-frozen tuna destined primarily for EU and Asian export markets[32],[33]. Domestic consumption is strongly fish-based, with tuna being part of breakfast, lunch, and dinner in multiple forms, fresh, boiled, curried, canned, or dried contributing substantially to protein intake, culinary identity, and household food security[34].

The trend in processed fishery commodities shows a clear upward growth, with production rising by approximately 150–160% from 2013 to 2023, demonstrating a strong long-term increase driven by expanding processing capacity and international market demand (Fig 4). Fig 5 reveals that processed skipjack tuna dominates the category, accounting for about 55–60% of total processed output, followed by prepared skipjack tuna at around 20–22%, while yellowfin tuna contributes about 8–10%. All other processed categories, including tuna meal, tuna loins, miscellaneous marine fish, dried tuna, and frozen bigeye, each represent less than 4–5% individually.

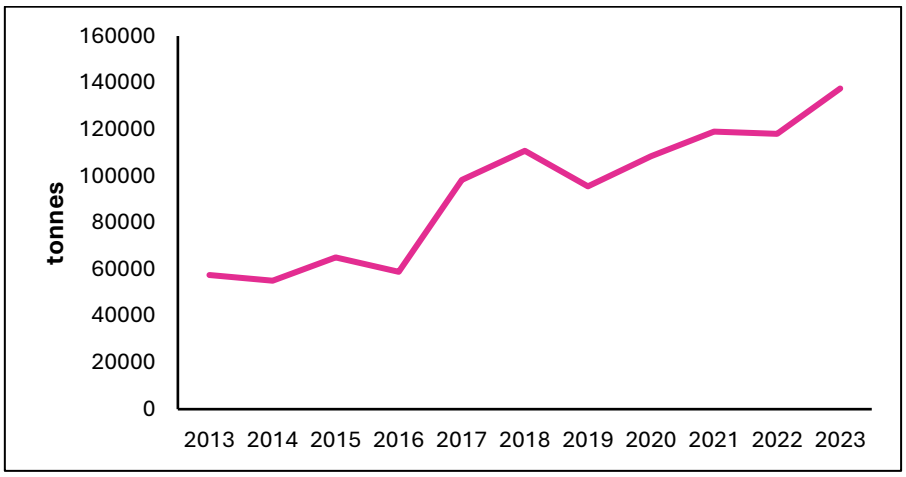


**Figure 4: Trends in the Processed Fishery Commodities**

Source: Fishstatj

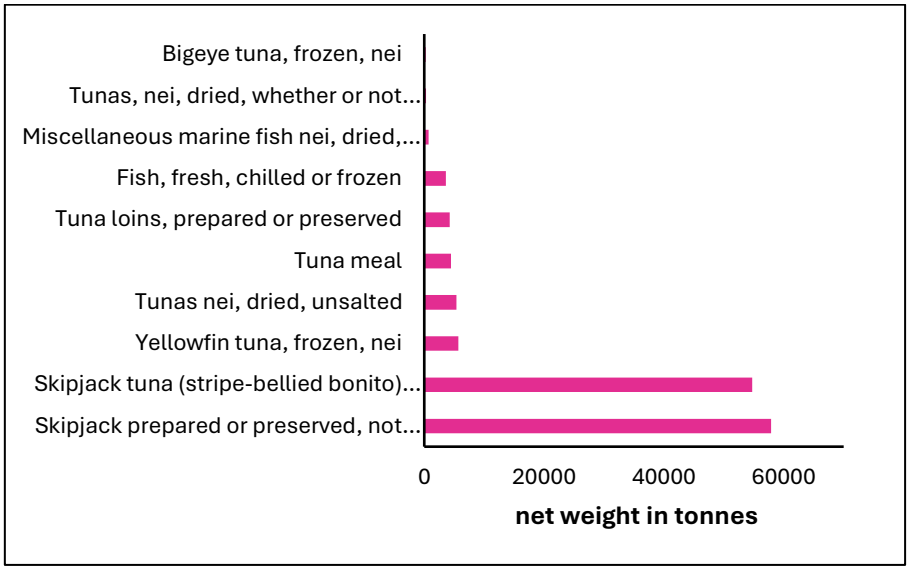


**Figure 5: Top Processed Commodities**

Source: Fishstatj

## 4. Trade and Market Dynamics

### 4.1. Overview of fish exports (species, value, markets)

The trade trend (Fig 6) shows that imports have grown significantly, rising by about 70–75% between 2014 and 2023, while exports increased more moderately by roughly 20–25% over the

same period. Notably, imports surpassed exports in several recent years, with a peak around 2022, indicating rising domestic demand for externally sourced seafood and high-value species.

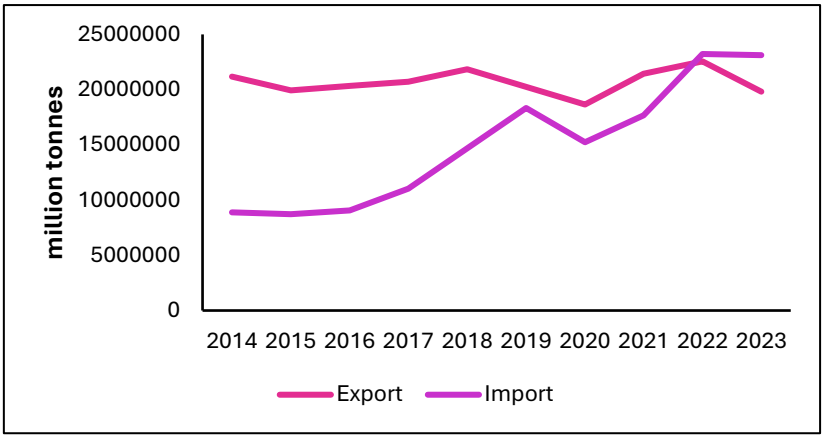


**Figure 6: Trade trend**

The commodity breakdown (Fig 7) reveals that frozen skipjack tuna dominates trade flows, accounting for about 42–45% **b** listed commodity volume, followed by skipjack in prepared/preserved form at 18–20%**,** and tuna loins/fillets at around 11–12%**.** Medium-share commodities, such as frozen yellowfin tuna and shrimps/prawns, each contribute about 8–10%**,** while lower-share items like tuna meal and dried tuna represent less than **5%** individually. Together, these percentages show that China's marine trade dynamics are strongly centered around tuna-based products, with imports increasingly supporting domestic consumption and re-processing industries, while exports remain directed toward processed and value-added tuna items for international markets.

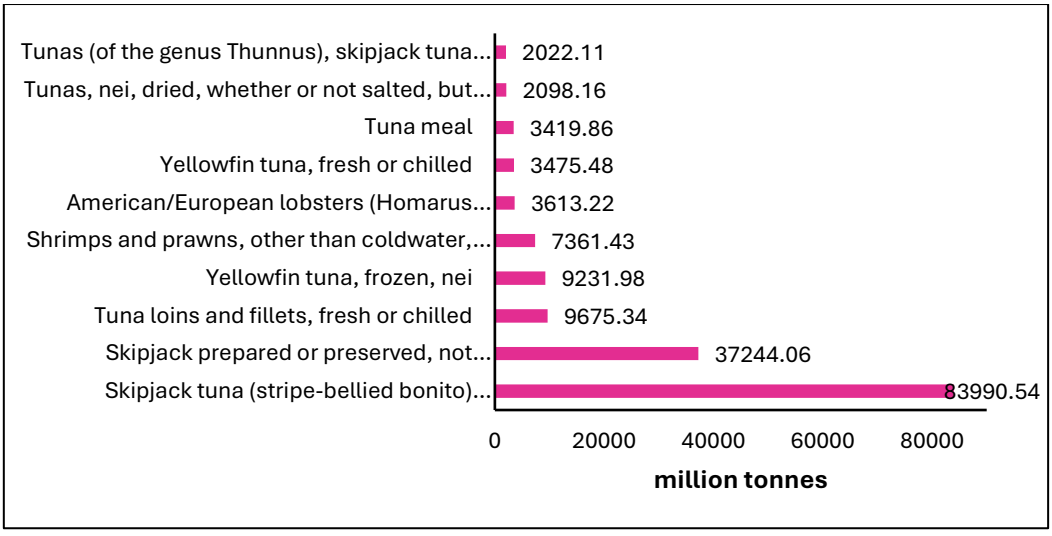


**Figure 7: Top Commodities in trade Dynamics**

The export commodity data shows that frozen skipjack tuna overwhelmingly dominates, accounting for approximately 48–50% of total exported volume, followed by prepared/preserved skipjack at around 21–23%, and tuna loins and yellowfin (fresh or frozen) collectively contributing another 20–22%. Smaller export items, such as tuna meal, dried tuna, and grouper, each make up less than 4–5%, indicating that China's tuna export economy is strongly concentrated around skipjack, with yellowfin as a secondary product stream. In contrast, the import data reveals a different structure: shrimps and

prawns lead imports at around 28–30%, followed by American/European lobsters at approximately 14–15%, while salmon-related products (fresh, frozen, smoked) collectively account for about 20–22% of total import volume. Cuttlefish, squid, octopus, and frozen fish fillet each form smaller shares of 6–8%. Overall, the percentages demonstrate a clear trade asymmetry: China predominantly exports tuna-based products while importing high-value crustaceans and premium salmon species, reflecting differing domestic demand profiles and processing specializations in the international seafood trade.

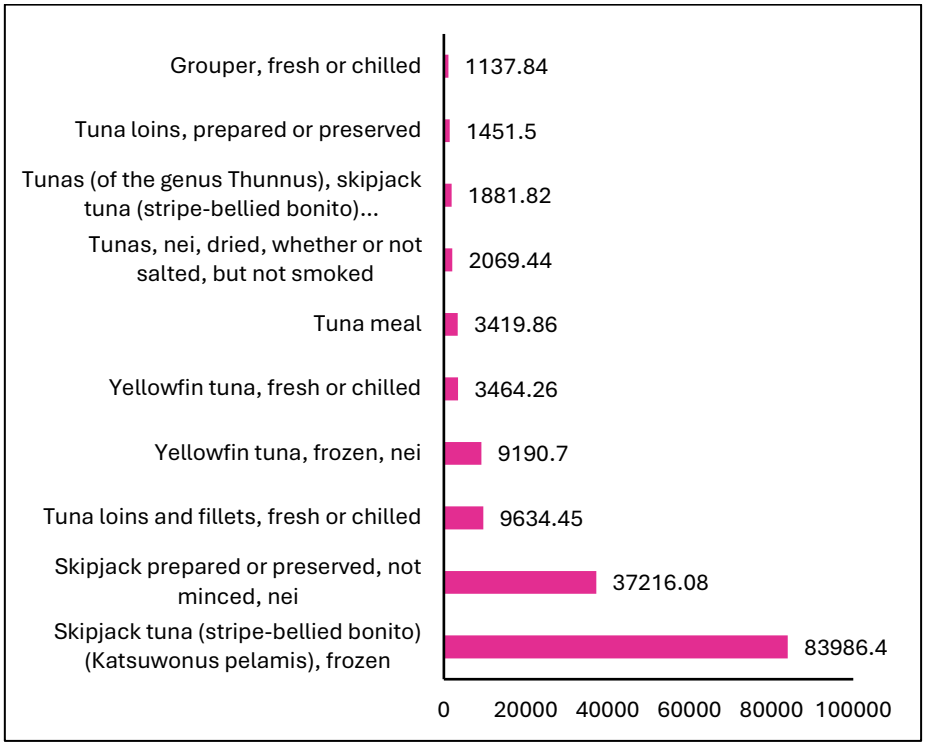


**Figure 8. Top Commodities in Export**

Data: million tonnes
Source: FAO: Fishstatj

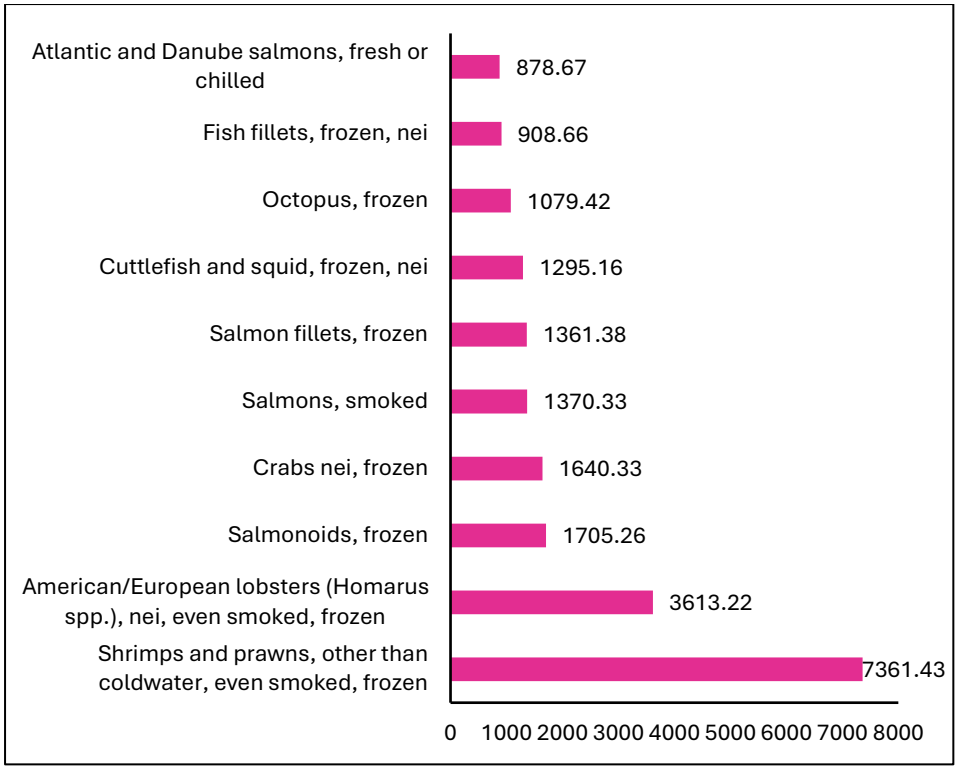


**Figure 9: Top Commodities in Import**

Data: million tonnes; Source: FAO: Fishstatj

### 4.2. Key import flows and their drivers

Key fisheries-related imports in the Maldives primarily consist of processed fish products, fishmeal, fish oil, and crucially inputs for the domestic fishing industry such as fuel, gear, refrigerants, packaging materials, and ice-plant equipment components. Although Maldives is a net exporter of tuna, the country imports higher-value seafood items for tourism consumption, including salmon, lobster, shrimp, and premium reef fish cuts to meet resort dining demands[35], [15]. A major driver of fisheries-related imports is the limited domestic manufacturing capacity for industrial supplies, which necessitates importing reels, lines, hooks, nets, spare parts, freezing machinery, and canning materials for tuna processing plants[36]. Additionally, reliance on imported diesel fuel is critical, fuel accounts for 40–60% of operational costs for the pole-and-line fleet[21], making it one of the most economically influential imports. Imports of fishmeal and supplemental feed also support the small but emerging mariculture and aquaculture segments. These import flows reflect structural constraints of a geographically dispersed island state with limited industrial capacity and a tourism-driven demand for premium seafood varieties that are not locally abundant.

### 4.3. The role of domestic markets in providing affordable fish to households

Domestic fish markets in the Maldives play a central role in supplying households with accessible, relatively low-cost animal protein, especially tuna, which remains the primary source of animal protein for most Maldivians[37],[38]. National assessments show that fisheries are a “major contributor to food availability and access”, with tuna and tuna-like species making up about 95% of total fish catch and per capita fish consumption estimated at ~163–181 kg/year, among the highest in the world[39],[40]. FAO analysis of tuna value chains indicates that around 30% of the national catch by weight is retained for local consumption, sold mainly as fresh, chilled,

dried or smoked tuna (including *Maldives fish*) through island landing sites, the Malé fish market and retail outlets, forming the backbone of everyday diets in both urban and outer-atoll communities[4142]. Because many poorer and remote households depend on locally landed tuna rather than imported meat, the performance of domestic markets and associated infrastructure (ice plants, storages, transport) is directly linked to the affordability and stability of fish supplies. The domestic fish consumption and protein intake from fish are declining year by year, and recommends optimising the location of fish storages and ice plants based on poverty rates, population density and child population to protect disadvantaged islands from nutrition insecurity, underlining how crucial well-functioning domestic fish markets are for keeping fish both available and affordable to Maldivian households[26]. Approximately 30% of national catch by weight is retained for local consumption and sold through landing sites and the Malé market, making domestic market performance critical for household nutrition—particularly in remote atolls[8].

### 4.4. Barriers and opportunities (tariffs, non-tariff measures, certification, and traceability).

Maldivian fisheries face a mix of trade barriers and emerging opportunities linked to tariffs, non-tariff measures, certification and traceability. After Maldives lost EU GSP/EBA preferences, canned and processed tuna exports to the EU and UK began facing MFN tariffs of about 22–24%, which domestic analyses identify as a major constraint on competitiveness versus suppliers that still enjoy duty-free access; recent government briefings and media reports describe current EU duties of around 24% and note ongoing negotiations (including via an OACPS–EU EPA route and bilateral diplomacy) to restore preferential or zero-duty treatment, while the UK has launched an FTA process explicitly aimed at removing tariffs on Maldivian fish exports[43,44,45,46]. Beyond tariffs, Maldivian tuna must comply with stringent non-tariff measures, notably the EU IUU Regulation catch-certificate system, sanitary and phytosanitary (SPS) and technical (TBT) standards and buyer-driven social-risk due-diligence requirements; these reflect a wider global pattern in which SPS/TBT measures account for most NTMs applied to fish trade[47],[48]. To turn these requirements into market openings, the Maldives has invested heavily in sustainability certification and traceability: its pole-and-line skipjack and associated yellowfin units are certified to the Marine Stewardship Council (MSC) standard and continue to pass surveillance and scope-extension audits, while a yellowfin handline Fishery Improvement Project (FIP) led by IPNLF and domestic processors holds an "A" progress rating and underpins access to eco-labelled, premium markets[49]. At the same time, the Keyolhu web-based Fisheries Information System, embedded in the 2021 Tuna Fishery Management Plan and highlighted in the 2024 WTO Trade Policy Review, enables online recording of catch and effort, vessel registration, licences, fish purchases and EU catch certificates for one-by-one fleets, significantly strengthening lot-level traceability and helping Maldivian exporters meet the documentation demands of the EU and other high-value markets[50],[36].

## 5. Nutritional Contribution of Fish

### 5.1. Fish's share in total protein intake

In the Maldives, fish (and other marine products) contributes a very large share of dietary protein: according to the country's own policy document, the National Fisheries and Agricultural Policy 2019–2029, fish consumption supplies on average around 71% of animal-source protein intake for the population[51], [52]. Because animal-source protein typically constitutes a substantial part of total protein intake in the Maldives, this implies that fish constitutes a major component of total

protein consumption in the diet. Indeed, general global-level analyses highlight that in the Maldives seafood accounts for roughly one-third of total protein intake[53],[15]. A recent study focusing on food security and nutrition in the Maldives (2024) however indicates a declining trend in per-capita protein intake from fish, reporting a decrease of approximately 3.3 g per capita per day over recent years[26].

### 5.2. Key micronutrients supplied (Ca, Fe, Zn, I, Se, Vitamin A, Vitamin B12, DHA/EPA)

Because Maldivians have some of the highest aquatic-food intakes in the world, fisheries are the dominant dietary source of several critical micronutrients, including calcium (Ca), iron (Fe), zinc (Zn), iodine (I), selenium (Se), vitamin A, vitamin B12 and long-chain omega-3 fatty acids (DHA/EPA). FAO's recent analyses and global blue-food assessments show that marine fish and small pelagics typically provide highly bioavailable iron, zinc, calcium, iodine, selenium and vitamin B12, as well as preformed vitamin A and long-chain omega-3s (DHA/EPA), often contributing more than half of recommended intakes where fish consumption is high[54], [55],[56]. In the Maldives specifically, global modelling work on "aquatic foods to nourish nations" identifies Maldivian children as among those who would see a substantial reduction in inadequate calcium intake if current fish consumption were maintained or increased, underscoring the role of fish in Ca supply[57]. Recent Indian Ocean and tropical-fishery nutrient studies that explicitly include Maldivian catches show that a standard daily portion of nearshore fish from Maldives can deliver ≥30% of the recommended daily allowance of iron, alongside significant contributions of calcium, selenium, vitamin A and zinc[58],[59]. Furthermore, cross-country work on "least-cost nutritious species" finds that in Maldives, catches dominated by small pelagic fish and tuna are among the most nutrient-dense and affordable sources of these micronutrients, providing dense packages of Fe, Zn, Ca and B12 per unit cost[60]. A recent Maldives-specific food-security study confirms this pattern at household level: higher fish-based food-consumption scores were significantly associated with better adequacy of vitamin A, iron and calcium, indicating that domestic fish consumption is a primary vehicle for these micronutrients in Maldivian diets, particularly in poorer and remote islands[61].

### 5.3. Role of small fish species consumed whole

In the Maldives, small fish species that are often consumed whole (e.g. small reef fish and mackerel-sized pelagics) play an important – but often under-recognised – role in nutrition and food security alongside tuna. Household data from the HIES 2019 classify "reef fish, small variety (can fit in your cupped hands, e.g. mackerel)" as a distinct, frequently consumed item, indicating regular use of small-bodied fish in everyday diets, especially in atoll communities outside Malé[62]. A recent food-security study in Dh Atoll found that 58% of households preferred reef fish over oceanic tuna, many of which are small-bodied species that can be cooked and eaten almost entirely, including bones and head, and are particularly important for poorer households with limited access to imported food[26]. Global nutrient studies show that when small fish are eaten whole, mineral-rich parts such as bones, head and viscera substantially increase intakes of calcium, iron, zinc and selenium, as well as vitamin A and B12[63].

### 5.4. Evidence from national nutrition surveys or literature

**Table 2: Primary outcome indicators for the Six Global Nutrition Targets**

| Indicator | Year | Value |
|---|---|---|
| Stunting (HAZ <-2 SD) in children 0-59 months (%) | 2009 | 20.3 |
| Anaemia in pregnant women (Hb <110 g/L) (%) | 2016 | 46.9 |

| Indicator | Year | Value |
|---|---|---|
| Anaemia in non-pregnant women (Hb <120 g/L) (%) | 2016 | 42.4 |
| Low birth weight (<2500 g) (%) | 2015 | 11.7 |
| Overweight (WHZ >+2 SD) in children 0-59 months (%) | 2009 | 6.5 |
| Exclusive breastfeeding under 6 months (%) | 2016 | 63 |
| Exclusive breastfeeding under 6 months (%) | 2009 | 45.3 |
| Wasting (WHZ <-2 SD) in children 0-59 months (%) | 2009 | 10.2 |

Source: Nutrition Landscape Information System (NLiS)[64]

# 6. Fish Loss and Waste (FLW)

## 6.1. The main points along the chain where losses occur (landing, transport, processing, retail)

Reports available are a little dated[65]. Losses are concentrated at landing and handling stages in outer atolls where few quays or chilled facilities exist, and during transport and temporary storage prior to processing[8].

## 6.2. Available estimates of quantity and value lost

Domestic market wastage is estimated in the order of 1,500–2,000 t/year at market level, driven by storage and infrastructure constraints[8].

## 6.3. Causes (infrastructure, handling, storage)

Almost all the atolls have fairly poor facilities for fish landing (few have quays), most of the fish being landed (directly on the beach or by feeder boats), gutted and prepared on the beach and/or adjoining areas. Even the fish which has undergone some chilling on-board suffers due to lack of ice and/or facilities to keep the fish chilled after landing. Contamination of the fish from polluted beach areas and water is yet another drawback.

## 6.4. Mitigation practices or innovations

Suggested mitigation practices include:

a) establishment of special sheltered areas/ fish sheds with an adequate fresh water storage for supply to fishing vessels/ suitable areas with proper drainage and provision for waste disposal, fish landing and preparation/ cleaning
b) installing facilities for temporary storage or holding of chilled fish after landing, prior to processing

The chief beneficiaries will be small to medium scale fishers and fish processors.

Mitigation measures include sheltered fish-landing sheds with freshwater supply and drainage, temporary chilled holding facilities, and solar-powered or modular ice plants to improve local cold-chain continuity[8].

# 7. Socio-economic and Gender Dimensions

## 7.1. Employment generated by the sector (fisheries, aquaculture, post-harvest)

Recent World Bank analysis on climate change and fisheries estimates that fisheries accounted for about 11% of the national labour force in 2015, were the *dominant livelihoods provider across inhabited islands*, and are often the only source of employment in remote atolls without tourism, underscoring the sector's central role in rural jobs and incomes[66]. The same study reports that the number of recorded fishers averaged ~7 850 (2014–2016) and then rose sharply to 17 589 in 2017, which is also the latest value reported in the 2023 Statistical Yearbook, capturing primarily tuna and reef fishers[6768]. A 2024 World Bank background report on fisheries and coastal communities notes that tuna fishing alone "supports the livelihoods of about 30% of Maldives' population," once associated household and value-chain activities are included[52]. Downstream, a 2025 World Bank Study on Women's Employment, Safety, and Mobility in the Maldives shows that the fisheries workforce is concentrated in fish processing, with 68% of surveyed workers in formal jobs, and confirms that women are mainly employed in post-harvest roles such as cleaning, drying/smoking, canning, retail and small-scale processing[52]. Earlier socio-economic work on the tuna sector similarly found that many women and unemployed household members engage in cottage-scale smoking/drying and small processing enterprises, suggesting that official employment statistics under-count post-harvest jobs[21.] Aquaculture and mariculture (sea cucumber, grouper, ornamentals and hatcheries) are still relatively small employers but are explicitly identified in the National Fisheries and Agricultural Policy 2019–2029 and in ILO job-creation strategies as growth areas for future employment and youth entrepreneurship, alongside increased value-addition and processing[53]. Fisheries remain a major rural employer (estimates indicate about 10,000–30,000 people directly engaged, depending on coverage), with downstream processing providing substantial on-island jobs[8].

## 7.2. The role of women in processing, trading, and marketing

Women in the Maldivian fisheries sector are concentrated in post-harvest processing, trading and local marketing, and they are critical to turning fish into cash income for households and communities. The 2025 World Bank study on women's employment in tourism and fisheries shows that the fisheries workforce is heavily concentrated in fish processing, with women largely occupying processing, smoking, drying, retail and collection roles, while men dominate offshore fishing and transport; the study also notes that women are present in C-level and ownership roles in fish retail and processing businesses, but face persistent gender discrimination, low wages and delayed payments[69]. FAO's work on Maldivian gender roles reports that women traditionally shoulder responsibility for smoking, drying and other preservation techniques, and that their marketing activities are mostly confined to local island markets, whereas men more often travel long distances (e.g. to Malé) to sell bulk fish, reinforcing a gendered division between local and wholesale trade[70]. A 2024 INFOFISH/IPNLF article further characterises Maldivian women as those who "turn the fish into money", highlighting that women dominate small-scale tuna processing and local sales for domestic consumption, yet frequently face unfair and delayed payments, limited access to credit and weak bargaining power, challenges that initiatives like the eDhumashi digital platform aim to overcome by connecting women processors directly to consumers and improving financial inclusion[71].

| Activity | Men | Women | Children |
|---|---|---|---|
| ***Shark fin*** | | | |
| • Landing | + | | |
| • Removal of fins | + | | |
| • Drying in sun | | + | + |
| ***Salted products (tuna, sharks, reef fish)*** | | | |
| • Cleaning and washing | + | + | |
| • Applying salt and storing in brine tank | | + | |
| • Washing | | + | |
| • Sun drying | | + | + |
| ***Sea cucumber*** | | | |
| • Collection | + | | |
| • Sorting | + | + | |
| • Pre-boiling, burying in sand | + | + | |
| • Cleaning | + | + | |
| • Boiling | | + | |
| • Smoking | | + | |
| • Sun drying | | + | + |
| ***Walhoa mas (soft-dried products) and Hikimas (hard-dried products)*** | | | |
| • Filleting | + | + | |
| • Boiling | | + | |
| • Smoking | | + | |
| • Drying | | + | + |
| • Storing | | + | + |
| ***Marketing*** | | | |
| • in the local area | + | + | |
| • in Male' | + | | |

**Table 3: Gender Roles in Fisheries harvesting and Post-harvesting Activities**

Source: FAO[72]

### 7.3. Constraints faced by small-scale actors (e.g. access to finance, technology)

Small-scale actors in Maldivian fisheries, especially one-by-one tuna fishers, women processors, traders and small entrepreneurs, face a bundle of structural constraints around finance, technology, infrastructure and climate risk. World Bank analysis for the new SWIOFish5 / Maldives project notes an "absence of adequate commercial credit", with community-level infrastructure (ice plants, small processing units) rarely attracting private finance and a generally "constrained climate for private-sector expansion," which limits investment by small enterprises in boats, gear and value-addition[73]. Climate change compounds these barriers: increasing storminess, coral-reef degradation and shifts in tuna distribution are raising unit fishing costs for artisanal fishers and damaging landing and shore infrastructure, making it harder for small-scale operators to maintain profitability[59]. For women running home-based processing and trading businesses, a 2023 IPNLF baseline survey on Gemanafushi Island and a 2024 INFOFISH/IPNLF brief document poor access to market information and credit, delayed and unfair payments from middlemen, unreliable buyers, low demand and lack of product standardization/branding, together with gaps in business, financial and digital literacy[57],[74]. On the technology side, national policy and the 2021 Maldives Tuna Fishery Management Plan highlight the need for innovation (electronic information systems such as *Keyolhu*, improved monitoring and live-bait efficiency), yet many small fishers and processors still have restricted access to cold-chain facilities, digital tools and modern gear, particularly in outer atolls[38,53,75].

# 8. Sustainability and Resilience

## 8.1. Summary of stock status where available (overfishing, recovery, habitat pressures)

Recent evidence paints a mixed picture of stock status in Maldivian fisheries, with relatively well-managed offshore tuna contrasted against increasingly pressured reef and baitfish resources and degrading habitats. For the mainstay skipjack tuna, the latest IOTC stock assessment (2023) concludes that the Indian Ocean stock is not overfished and not subject to overfishing, a finding echoed in harvest-strategy documentation and global tuna status reports, although catches have repeatedly exceeded advised limits, raising concern about future depletion risk[76,77,78,79]. By contrast, yellowfin (and bigeye) tuna in the Indian Ocean remain overfished and subject to overfishing, with no improvement in status reported in recent IOTC and independent scientific reviews; Maldivian one-by-one fleets are part of this shared stock, and the 2021 Maldives Tuna Fishery Management Plan explicitly recognises the need to align national effort with IOTC rebuilding measures[63,38,80,81,82]. Closer inshore, reef-associated fish stocks show clear signs of stress: the World Bank's coral-reef resilience roadmap and CCDR background papers report that fish catches and stocks on many Maldivian reefs are declining due to combined pressures from increased fishing (especially to supply tourism), pollution, and coastal development, while a 2025 national ecological baseline explicitly notes that harvests already exceed sustainable levels on many coral reefs[83,84,85]. Empirical work on consumption and markets shows that reef fish now make up a large share of fish eaten by tourists and an increasing share of local diets, raising concern about long-term reef resilience and food security if management does not catch up with demand[26,86]. The livebait fishery that underpins Maldivian pole-and-line and handline tuna is also flagged as vulnerable: recent analyses highlight growing effort, the use of lights at night and the dependence on lagoon and reef habitats, while reiterating that no comprehensive stock assessment exists and status remains poorly known, prompting new projects on improved monitoring and management[87,88,89].

## 8.2. Environmental risks (pollution, waste, carbon intensity)

Environmental risks to Maldivian fisheries are driven by land- and sea-based pollution, mounting solid and plastic waste, and dependence on fossil fuels, even though core tuna fisheries remain relatively low-carbon compared with many global fleets. The *State of the Environment – Maldives* reports that coastal and marine pollution arises from mismanaged solid waste and untreated sewage, alongside oil and ship-borne pollution, directly affecting lagoons, reefs and nearshore fisheries habitats[90,91]. Recent policy analyses estimate the Maldives now produces ≈19,800 t of plastic waste per year, about 37.9 kg per capita, of which 87% (≈17,200 t) is mismanaged, with open burning and leakage from the Tilafushi landfill sending plastics and toxins into the sea; plastic waste accounts for roughly 12% of total waste and threatens marine ecosystems, tourism and public health[92,93,94]. The National Marine Litter Policy and Action Plan 2021–2030 and a detailed marine plastic-pollution assessment identify mismanaged land-based waste, fishing, tourism and shipping, plus plastics transported by currents, as the main sources of marine litter, prompting bans and phase-outs of single-use plastics and circular-economy measures[95,96,97]. Scientifically, microplastics have now been detected inside reef-building corals of Maldivian atolls and, more recently, accumulating in mangrove forests, indicating pervasive contamination of key nursery habitats for reef fish and invertebrates that underpin small-scale fisheries[98, 99,100]. At the same time, Maldivian pole-and-line tuna fleets are relatively fuel-efficient: updated ISSF and ICSF summaries of Miller et al. show fuel-use intensity of about 197–328 L fuel per tonne of

tuna, several times lower than many industrial purse-seine and longline fleets, yet these fisheries remain fully diesel-dependent and therefore contribute to national greenhouse-gas emissions[7].

### 8.3. Climate risks and adaptation measures

Climate projections show that Maldivian fisheries face high climate risk across tuna, reef and baitfish stocks, but the country has begun to articulate a fairly clear adaptation agenda. The World Bank's 2024 *Country Climate and Development Report* and its fisheries background study project that, under a high-emissions scenario, maximum fish catch potential in the Maldivian EEZ could fall by up to ~100% by the end of the century, with revenues shrinking by a similar magnitude and about 90% of key species rated at very high climate risk due to warming, acidification and declining oxygen[101,102]. These risks are driven by more frequent marine heatwaves and coral bleaching, ocean acidification, shifting tuna distributions (deeper and further from shore), and pressures on reef and livebait habitats, compounded by sea-level rise, coastal flooding and storm surges that damage harbours, fish-landing sites and processing facilities[103,104.] Livelihood assessments by the Red Cross/Red Crescent and ADB–World Bank highlight that small island fishing communities, especially those relying on reef fish, baitfish and informal post-harvest work, are highly exposed and have limited diversification options, making climate shocks a direct threat to food security and employment[105, 106.] In response, Maldives' INDC and Third NDC explicitly prioritise fisheries adaptation, including facilitating tuna fleets to follow fish into deeper waters, diversifying the sector into other marine resources and mariculture, strengthening fisher insurance schemes, and expanding early-warning and climate-information services for weather- and ocean-dependent livelihoods. They also call for coral-reef conservation using an ecosystem approach and reducing land-based pollution to safeguard reef fisheries, alongside climate-proofed coastal infrastructure around ports and harbours that service the fleet[107,108]. At the policy and project level, the FAO–UNDP SCALA and FAO Country Programming Framework processes support integration of climate change into fisheries, agriculture and natural-resource management, while the World Bank CCDR recommends climate-smart, risk-based harvest strategies, habitat protection for livebait and reef fish, targeted social protection and livelihood diversification to keep fisheries viable under future ocean conditions[109, 9].

### 8.4. Resilience factors (diversification, community practices, and early warning systems).

The World Bank's *Country Climate and Development Report* and its fisheries background study emphasise diversification away from sole dependence on oceanic tuna, into mariculture, reef-friendly tourism, value-added processing and non-fisheries income streams, as a core strategy to reduce vulnerability of fishing households and island economies[88,87]. FAO's Country Programming Framework (2022–2026) and the FAO–UNDP SCALA programme similarly supports resilience by strengthening priority agrifood value chains, promoting biodiversity-friendly practices and engaging the private sector in climate-smart investments that link small-scale fishers with more stable markets and complementary on-island livelihoods[95],[110]. At community level, Red Cross/Red Crescent assessments highlight strong social networks, local self-help groups and traditional resource practices in fishing villages as important buffers during climate shocks, and call for scaling "climate-smart livelihoods" that blend fisheries with other income sources[91]. Early-warning and climate-information systems are a third pillar: national DRR reviews and crisis-preparedness analyses describe ongoing upgrades to multi-hazard early warning systems, including the Common Alerting Protocol platform, a Multi-Agency Situational Room

and targeted communication to remote fishing islands, although coordination across sectors remains a challenge[111].

# 9. Governance and Policy Framework

## 9.1. Overview of national fisheries and aquaculture policies

Maldives' national fisheries policy framework is centered on sustainable utilization of marine resources, food security, and ecosystem stewardship, with the National Fisheries and Agricultural Policy 2019–2029 serving as the primary guiding instrument. This policy emphasizes ecological resilience, data-driven management, precautionary and ecosystem approaches, stakeholder participation, and alignment with international measures. It is operationalized through a suite of species- and sector-specific Fishery Management Plans (FMPs), including tuna, reef fish, grouper, lobster, billfish, marine aquarium species, sea cucumber, and squid, each of which embeds principles of precaution, sustainability, participatory governance and biodiversity protection. The legal foundation for fisheries governance is the Fisheries Act of 2019, which codifies sustainable resource utilization, mandates application of the ecosystem and precautionary approach, and establishes licensing, enforcement, registry and monitoring functions for the Ministry of Fisheries. In addition, the Maldives' National Plan of Action to Prevent, Deter and Eliminate IUU Fishing (2019) strengthens compliance with IOTC measures and international frameworks, while broader policies such as the National Biodiversity Strategy and Action Plan 2016–2025 and environmental legislation embed the conservation of species and habitats critical to fisheries sustainability. Overall, the policy and legal architecture reflects high alignment with the Ecosystem Approach to Fisheries, with 71 out of 82 EAF legal requirements incorporated, signifying a strong and modern fisheries governance framework geared toward long-term sustainability and community well-being.

## 9.2. Food safety and quality assurance systems

Food safety and quality assurance for fisheries in the Maldives are anchored in a structured system that meets both domestic standards and stringent export requirements for high-value markets such as the EU, UK, and Asia. The Fisheries Act (2019) mandates sanitary standards, traceability, and licensing of processing facilities, while the Maldives Food and Drug Authority (MFDA) oversee seafood safety through inspection, sampling, and enforcement of microbiological and chemical limits for fish products. For export certification, Maldivian tuna producers comply with EU hygiene regulations, HACCP protocols, and ISO-based quality systems, including EU-approved processing plants and catch-certification procedures to verify legal origin. The Keyolhu digital fisheries information platform, integrated with the national catch-certificate system, further strengthens traceability from vessel to buyer, allowing verification of catch location, species, trip data, and condition before processing or export. The 2022–2024 food-system resilience assessments also highlight ongoing efforts to reduce histamine occurrence in tuna, strengthen cold-chain continuity, and improve vessel hygiene practices. Combined, these systems allow Maldives to ensure that fish products, particularly one-by-one caught tuna, meet stringent safety, quality and sustainability criteria for both domestic consumption and international trade.

## 9.3. Participation in international agreements (e.g., WTO fisheries subsidies, PSMA, CITES)

Maldives is an active participant in major international agreements governing fisheries, marine conservation and trade, demonstrating a strong commitment to responsible fishing and global

compliance. As a member of the Indian Ocean Tuna Commission (IOTC), Maldives adheres to regional conservation and stock-management measures for tuna and associated species. It is a Party to the FAO Port State Measures Agreement (PSMA), which strengthens its capacity to combat IUU fishing through inspections, port controls and catch documentation. Maldives is also a WTO member and active supporter of the WTO Agreement on Fisheries Subsidies (2022), advocating for disciplines on subsidies that contribute to overcapacity and overfishing. Under CITES, Maldives regulates trade of listed marine species such as corals, sharks, sea cucumbers and ornamental species often exported to the aquarium market. The country is further aligned with the UNCLOS maritime regime, the UN Fish Stocks Agreement, and is a signatory to the Convention on Biological Diversity (CBD), including the 2022 Kunming–Montreal Global Biodiversity Framework, which informs national reef conservation policies. Maldives also engages in the IMO frameworks for vessel safety and pollution, participates in the CMS (Convention on Migratory Species) for shark and turtle conservation, and supports the IMO MARPOL convention, including plastics and waste-management provisions. Collectively, these multilateral commitments embed Maldives within a dense governance architecture that reinforces sustainable fisheries management, transparency, ecosystem protection and compliance with global trade and biodiversity norms.

Major international conventions that Maldives is a party to:

- Convention on Biological Diversity ( CBD )
- Nagoya Protocol on Access to Genetic Resources and their Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity
- Convention on International Trade in Endangered Species of Wild Fauna and Flora ( CITES )
- United Nations Framework Convention on Climate Change ( UNFCCC )
- Kyoto Protocol to the United Nations Framework Convention on Climate Change
- Paris Agreement
- United Nations Convention on the Law of the Sea ( UNCLOS )
- United Nations Fish Stocks Agreement ( UNFSA )

### 9.4. Institutional arrangements for managing value chains

Institutional arrangements for managing fisheries value chains in the Maldives are coordinated through a multi-agency framework anchored by the Ministry of Fisheries, Marine Resources and Agriculture (MoFMRA), which leads policy, licensing, resource management and oversight of fishery management plans. The Maldives Marine Research Institute (MMRI) generates stock-status, baitfish and ecosystem data supporting science-based management and resource monitoring. The Maldives Food and Drug Authority (MFDA) govern food safety, export compliance, and hygiene certification for tuna and processed products, while the Maldives Customs Service manages import/export documentation and tariff administration. Critically, the digital Keyolhu traceability system links vessel licensing, catch recording, fish purchase data, and EU-compatible catch certificates across the value chain, enhancing transparency and

quality assurance. State-owned enterprises such as Maldives Industrial Fisheries Company (MIFCO) play a strategic role in purchasing tuna from small-scale fishers, stabilizing prices, providing processing facilities (canning, freezing, smoking), and acting as a guaranteed buyer of last resort in remote atolls. At the community level, island councils, cooperatives and women-led processing groups provide local coordination for landing, drying, marketing and informal distribution networks. Finally, external institutions such as IOTC, the EU/DG-SANTE sanitary import framework, IPNLF, and FAO influence value-chain practices through compliance requirements, eco-certifications, best-practice standards, and research collaboration. Together, these institutions form an integrated governance and market architecture that links fisheries production at sea to domestic markets, export chains, and global regulatory frameworks.

# 10. Key Challenges and Opportunities

## 10.1 Most pressing constraints (production, markets, nutrition, gender, governance)

1. **Production:**
    a. Heavy reliance on skipjack & yellowfin tuna (~95–99% of catch), high vulnerability to climate-driven shifts in tuna distribution.
    b. Reef and baitfish stocks under stress; limited assessments for baitfish.
    c. Weak landing infrastructure in outer atolls (poor ice access, beach landings, contamination risks).
    d. Limited diversification; aquaculture largely negligible
2. **Markets:**
    a. Loss of EU GSP/EBA due to exposure to 22–24% tariffs on processed tuna.
    b. Small-scale actors face limited credit, poor cold chain, and expensive fuel (40–60% of operating costs).
    c. Limited market access for women-led microenterprises.
3. **Nutrition:**
    a. Triple burden of stunting, micronutrient deficiencies, and rising obesity.
    b. Declining household fish consumption in some islands.
    c. Limited dietary diversity despite high fish availability
4. **Gender:**
    a. Women dominate processing but have low wages, delayed payments, and limited access to credit.
    b. Restricted physical mobility to larger markets (e.g., Malé).
    c. Under-representation in cooperatives and decision-making.
5. **Governance:**
    a. Strong frameworks exist but enforcement gaps remain (reef fisheries, baitfish).
    b. Data gaps for reef stocks & baitfish; inadequate monitoring in outer atolls.
    c. Climate stress overwhelming institutional capacity

### 10.2 Promising opportunities or best practices that could be scaled up

1. **Production:**
    a. Global demand for sustainable pole-and-line tuna; Maldives already MSC-certified.
    b. Expansion of value-added processing (canning, drying, smoking).
    c. Potential for mariculture diversification (sea cucumber, ornamentals).
    d. Adoption of digital catch reporting (Keyolhu) for improved management
2. **Markets:**
    a. Ongoing UK FTA & possible EU tariff negotiations.
    b. Strong sustainability branding ("one-by-one tuna" identity).
    c. Ability to scale traceability & digital certification to access premium markets.
    d. Domestic market reform can stabilise affordable tuna supply to remote atolls
3. **Nutrition:**
    a. Very high fish intake offering Ca, Fe, Zn, Se, B12, DHA/EPA.
    b. Small fish eaten whole boost micronutrient intake.
    c. Integrating fish into national diet guidelines.
    d. Strategic placement of ice plants & storage to ensure equitable nutrition in outer atolls
4. **Gender:**
    a. Women-led processing & marketing cooperatives.
    b. Digital payment platforms (e.g., eDhumashi) to ensure fair, fast payments.
    c. Training in branding, packaging, and business skills to capture value from "Maldives fish".
5. **Governance:**
    a. Robust legislative base: Fisheries Act (2019), species-specific Fishery Management Plans.
    b. Digital traceability (Keyolhu) enables stronger monitoring and EU compliance.
    c. Opportunity to expand co-management with island councils & cooperatives.
    d. Integration of climate adaptation into fisheries NDCs

# 11.Priority Policy Recommendations

## 11.1 Key actionable policy recommendations linking aquatic foods, value chains and Food Security and Nutrition (FSN - six dimensions)

**Table 11.1: Key actionable recommendations**

| S. No | FSN Dimension | Policy Recommendation | Rationale | Supporting evidence |
|---|---|---|---|---|
| 1 | **Fish Loss & Waste (FLW)** | Upgrading landing-site infrastructure and cold-chain, scaling traceability (Keyolhu expansion), negotiating tariff relief for exports, strengthening reef-fish management and baitfish assessments, supporting women-led processing enterprises, and mainstreaming climate resilience measures. | poor landing facilities, beach landings, contamination from polluted areas, and lack of hygienic preparation spaces as major causes of post-harvest loss | |
| | | Expand Cold-Chain and Temporary Chilled Storage Capacity | Losses occur due to insufficient ice, limited cold-chain infrastructure, and lack of chilled storage after landing | |
| | | Improve On-Board Handling and Post-Harvest Practices | poor on-board ice use, poor handling during and after landing, and contamination risks as key drivers of FLW | |
| 2 | **Gender Inclusion** | Strengthen women processors through access to credit, | Women face delayed payments, poor bargaining | Women dominate processing roles but face unfair |

| S. No | FSN Dimension | Policy Recommendation | Rationale | Supporting evidence |
|---|---|---|---|---|
| | | digital payments, and direct-to-consumer markets (e.g., via e-commerce) | power and financing constraints | payment and lack of financial access. |
| | | Introduce women-led cooperatives in processing and reef-fish value-chains | Enables formal bargaining power and scale advantages | Women primarily working in fish cleaning, drying, curing and retail. |
| | | Business, branding and packaging training for women SMEs | Allows women to capture value from "Maldives fish" premium | Lack of product standardization & branding cited for small-scale women processors. |
| **3** | **Compliance & Trade Readiness** | Negotiate tariff-free access in EU & UK for tuna exports (through EPA, FTA and WTO channels) | Loss of GSP caused ~22–24% tariff on processed tuna | EU duties of ~24% are major constraints on competitiveness. |
| | | Scale MSC-certification and extend traceability to reef fish & baitfish | Allows new premium & sustainability markets | MSC certification for skipjack & yellowfin already functioning. |
| | | Improve SME export readiness through HACCP & EU compliance coaching | Small producers risk exclusion from higher-value markets | HACCP and catch certification mandated for export despite small-scale limitations. |
| **4** | **Environmental Sustainability** | Develop sustainable reef-fisheries harvest controls & no-take marine zones | Reef fish under pressure from tourism and local consumption | Evidence of declining reef stocks; many reefs beyond sustainable harvest levels. |
| | | Establish live-bait stock assessments | Tuna fishery relies on bait, stocks | No comprehensive baitfish stock |

| S. No | FSN Dimension | Policy Recommendation | Rationale | Supporting evidence |
|---|---|---|---|---|
| | | & regulate light-baiting | poorly assessed & vulnerable | assessment exists; status unknown. |
| | | Expand single-use plastic bans and enforce marine-litter policies | Severe mismanaged plastic waste threatens fisheries habitat | Maldives mismanages ~17,200 t of plastic annually (87% of total). |
| 5 | **Nutrition Contribution** | Promote small-fish consumption & whole-fish eating for micronutrient uptake | Provides Ca, Fe, Zn, Se, Vitamin A, B-12 | Reef-fish small species consumed whole provide high micronutrient density. |
| | | Integrate fish nutrient density into national diet guidelines | Helps combat child stunting & anaemia | Fish provides 71% of Maldivian animal protein & ~⅓ of total protein intake. |
| | | Improve distribution of affordable tuna to disadvantaged islands | Protects nutrition access during supply disruptions | Policy notes declining per-capita protein from fish & need for targeted storage placement. |
| 6 | **Climate Resilience & Readiness** | Modernize harbours and coastal infrastructure for storm surge & sea-level rise | Small-scale fishers at risk from climate events | National assessments show high vulnerability of coastal fish-landing facilities. |
| | | Provide micro-insurance & weather-index insurance to fishers | Reduces income shocks from lost fishing days | NDC prioritizes fisher-insurance expansion as climate adaptation. |
| | | Diversify fisheries toward mariculture & non-capture livelihoods | Reduces dependency on climate-susceptible tuna stocks | Policy supports diversification into mariculture, ornamentals, aquaculture. |

## 11.2 Recommendations (specific, feasible, and linked to national priorities)

### Table 11.2: Recommendations linked to national priorities

| Dimension | Policy Action(s) | Linked National Policy / Strategy |
|---|---|---|
| **Fish Loss & Waste (FLW)** | Establish sheltered fish-landing sheds across atolls with clean freshwater supply, proper drainage, and designated areas for gutting/cleaning | National Fisheries & Agricultural Policy |
| | Install ice plants and refrigerated holding units at landing sites and community markets, especially in outer atolls, to maintain continuous cold-chain between landing and processing | |
| | Introduce and train fishers on standardised handling protocols, proper icing on-board, hygienic unloading, and early contamination prevention | |
| **Gender Inclusion** | Support women-led microenterprises in drying, smoking, curing, cleaning and fish retail | National Fisheries & Agricultural Policy livelihood provisions; Women-focused enterprise & digital-market access initiatives (e.g., eDhumashi) |
| | Expand women's access to credit, guaranteed payments, and direct market access | World Bank women-employment findings; NDC livelihood-diversification strategy; MoFMRA inclusion initiatives |
| | Provide skill development for branding, packaging and business management | World Bank 2025 women's fisheries report; FAO–UNDP SCALA capacity-building programmes |
| **Compliance & Trade Readiness** | Strengthen HACCP & EU-compliance capacity for small processors | MFDA export certification; EU hygiene standards & catch-certificate system |

| Dimension | Policy Action(s) | Linked National Policy / Strategy |
|---|---|---|
| | Expand Keyolhu digital traceability to small fishers & reef fisheries | Keyolhu management system; 2021 Tuna Fishery Management Plan; WTO Trade Policy Review 2024 |
| | Pursue tariff-free market access with UK, EU and OACPS | WTO engagement; UK FTA negotiations; EU duty-exemption diplomatic channels via MoFA/MoFMRA |
| **Environmental Sustainability** | Strengthen reef-fish stock controls & establish conservation/no-take zones | Species-level Fishery Management Plans (reef, grouper, lobster); CBD & national biodiversity framework |
| | Conduct live-bait stock assessment and regulate bait fishing | Tuna Fishery Management Plan; MMRI stock monitoring commitments; IOTC ecosystem requirements |
| | Strengthen marine-litter enforcement & single-use plastic bans | National Marine Litter Policy & Action Plan 2021–2030; Fisheries Act environmental protections |
| **Nutrition Contribution** | Promote nutrient-dense small-fish & “Maldives fish” in domestic diets | Fisheries & Agricultural Policy nutrition alignment; national protein-intake & micronutrient evidence |
| | Ensure affordable tuna distribution to remote atolls | Domestic market supply optimisation recommended by 2024 food-security study |
| | Integrate fish nutrient data in national diet & health planning | National nutrition assessments; micronutrient–fish intake correlations in household surveys |
| **Climate Resilience & Readiness** | Expand climate-resilient mariculture & alternative livelihoods | National Fisheries and Agricultural Policy diversification clause; NDC climate-adaptation commitments |
| | Upgrade harbour & landing infrastructure for climate variability | National DRR & coastal-infrastructure resilience strategy; CCDR recommendations |
| | Introduce micro-insurance & social-protection mechanisms for fishers | INDC & Third NDC; WB & FAO recommendations for fisher insurance & social protection |

## 12.Provide the traffic-light scoring for the six key dimensions

**Table 12.1: Traffic light score for the six dimensions**

| Dimension | Score (1–5) | Colour | Key Notes |
|---|---|---|---|
| **Fish Loss & Waste** | **2** | | Significant losses occur due to limited cold-chain access, especially in outer atolls, and handling quality at landing stages. Estimated domestic-market wastage is ~1,500–2,000 tonnes/year due to storage and infrastructure constraints.<br><br>**Explanation:** Score reflects high dependence on ice-only storage and inadequate quality-management systems outside main commercial centres. |
| **Gender Inclusion** | **2** | | Women dominate post-harvest roles such as processing, smoking, drying and retailing, yet face weak bargaining power, limited credit access, delayed payments and exclusion from formalized cooperatives.<br><br>**Explanation:** High participation, low empowerment, major structural constraints remain. |
| **Compliance & Trade Readiness** | **4** | | Maldives maintains high export-quality standards via HACCP, MFDA compliance and strong EU-aligned certification, as well as MSC-certified tuna fleets and digital traceability via Keyolhu. However, exposure to EU tariffs (22–24%) creates market disadvantage.<br><br>**Explanation:** Score shows world-leading sustainability credentials, but trade barriers reduce full potential. |
| **Environmental Sustainability** | **2** | | Skipjack stocks remain healthy, but yellowfin is overfished; reef fish stocks are under strong pressure; baitfish stocks remain unknown; microplastic pollution and coral degradation threaten fisheries ecosystems.<br><br>**Explanation:** Reinforces urgency of reef conservation, baitfish assessment, and marine-pollution reduction. |
| **Nutrition Contribution** | **4** | | Maldives has one of the highest fish-consumption rates globally (~80 kg per capita/yr). Fish contributes ~71% of animal protein and ~⅓ of total dietary protein; small fish and tuna provide key micronutrients (Ca, Fe, Zn, Se, B12). |

| Dimension | Score (1–5) | Colour | Key Notes |
|---|---|---|---|
| | | | **Explanation:** Score reflects strong nutrition contribution, but dietary diversity gaps persist and obesity is rising. |
| **Climate Resilience & Readiness** | **3** | | Maldives invests in fisher insurance, fleet modernization, mariculture diversification, and climate-smart adaptation under national NDC commitments. However, climate risks remain extremely high: tuna migrations moving offshore, coral bleaching, and rising seas threaten landing infrastructure.<br><br>**Explanation:** Good strategic direction, but insufficient protection for small island communities and active resource users. |

## 13. References


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