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Legal and Policy Gaps in the Management of the Live Reef Food Fish Trade in the Coral Triangle Region

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CORAL TRIANGLE INITIATIVE ON CORAL REEFS, FISHERIES
AND FOOD SECURITY

LEGAL AND POLICY GAPS IN THE MANAGEMENT OF THE LIVE REEF FOOD FISH TRADE IN THE CORAL TRIANGLE REGION

Report prepared for WWF-Indonesia

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Executive summary

This report examines the legal and policy framework for the live reef food fish trade (LRFFT) in the Coral Triangle Initiative (CTI) countries – Indonesia, Malaysia, the Philippines, Papua New Guinea, the Solomon Islands and East Timor. It looks at four key areas: ecosystem approach to fisheries management; port state measures; trade and market measures; and combating illegal, unreported and unregulated (IUU) fishing. It compares the domestic implementation of LRFFT using benchmarks established under relevant international instruments and CTI management goals. It highlights trends and gaps in domestic legal frameworks and provides options for CTI countries to improve LRFFT management.

Despite the lack of a specific framework devoted to the LRFFT, there are sufficient measures under international fisheries law that CTI countries can use to support the implementation of regional objectives to promote the sustainable management of the LRFFT. CTI countries may also adopt these measures individually to address specific issues confronting their LRFF industries. In contrast to the international framework, national fisheries management and regulatory frameworks in the CTI region are relatively strong in aquaculture, allowing for the safety, proper handling and certification of live fish. The international framework does not adequately cover the application of Ecosystem Approach to Fisheries (EAF) measures, nor port measures within local (state and provincial) waters. This remains primarily in the realm of domestic fisheries governance.

There are four **key trends and gaps** in the management of LRFF fisheries in the Coral Triangle region:

- *Application of EAF measures*. CTI members' fisheries laws and regulations promote an EAF. This involves protecting target reef fish, habitats and associated ecosystems, marine protected areas and fisheries refuges; regulations for the capture and trade of endangered species; closed seasons and areas; and banning destructive fishing methods.
- *Trade of live fish under aquaculture regime*. CTI countries have adopted general regulations on the trade of live reef food fish based on licensing systems which mostly cover live fish coming from aquaculture. Export requirements primarily include certificates and permits (food safety, transport and trade), and precaution on introducing non-indigenous species.
- *Trade of endangered reef fish under the Convention on International Trade in Endangered Species (CITES)*. CITES regulates trade of endangered species in CTI countries. Legislative measures are in place in these countries, mainly to regulate the trade of Napoleon wrasse under Appendix II of CITES. These include export bans, quotas, size limits, registration of traders and reporting requirements.
- *Measures to combat IUU fishing do not specifically address LRFF fisheries*. CTI countries have adopted a number of flag, coastal, port and market measures to address IUU fishing. However, they apply these measures generally to marine capture fisheries. They are not tailored to prevent or deter IUU fishing in live reef food fish fisheries.

There is therefore an urgent need to establish an effective and comprehensive management framework to address threats to the LRFFT in CTI countries, including fish capture, culture, transport and trade. There are a number of options to align domestic implementation with international requirements and CTI objectives for the sustainable management of the LRFFT.

For the **capture of Live Reef Food Fish (LRFF)**, measures may include:

- Developing fisheries management plans for LRFF, taking into account existing fishing rights and the application of key principles such as use of best scientific evidence available, precautionary principle, environmental impact assessment and EAF;
- More effective data collection and periodic assessment of biological status and ecosystems of reef fish;
- Establishing licensing systems to control access to fisheries;
- Prohibition or limits on the amount, species covered and sizes of fish that may be caught;
- Stronger controls on destructive fishing methods;
- Regulations or bans on targeting spawning aggregations or fish in aggregation sites; targeting or retaining immature fish; taking endangered species; and minimizing bycatch;
- Introducing measures to minimize the risk of supplying fish carrying toxins, causing food borne illnesses;
- Monitoring fishing activities through reporting requirements, observer programmes and, if applicable, vessel monitoring systems.

In terms of **LRFF aquaculture**, management measures could include:

- Preference for hatchery-reared fry and fingerlings;
- Imposition conditions that harvesting of wild-caught fry and fingerlings can only occur when it can be demonstrated that such activity does not damage or negatively impact the sustainability of wild stocks;
- Compliance with applicable international and regional instruments and standards on LRFF aquaculture (food safety and quality and use of chemicals, for example);
- Minimizing post-capture mortality of wild-caught juveniles;
- Effective farm and fish health management practices that minimize risk of spread of fish pathogens;
- Sustainable sourcing of fish feed;
- Selection of aquaculture sites for LRFF that minimize interference with other coastal resource users and damage to habitats;
- Effective waste control and effluent management, and minimization of negative environmental impact.

Measures for the **handling and transport of LRFF** could include:

- Rules to make sure transhipment only occurs in designated areas unless other authorized monitoring arrangements are in place.
- Developing best practices to ensure that handling, holding and distribution facilities are designed, operated and maintained to keep LRFF in optimum condition to reduce waste, losses and spread of pathogens;

- Stricter regulations for the transport of live fish, such as using air-only modes of transport, or adopting equivalent and tighter controls in air and at sea transport.

CTI members should consider the following methods with respect to the **trade and consumption of LRFF**:

- Providing fish health certificates for each shipment of fish;
- Strengthening the licensing system to control the trade of LRFF, including terms and conditions such as a ban or limits on the amount, species covered, and sizes of fish that may be caught;
- Establishing a registration system for active and legal traders;
- Creating a legal requirement for export and import businesses to source fish supplied in accordance with international, regional and national standards on LRFF;
- Applying traceability programmes to ensure that LRFF shipments can be identified as either wild-caught or cultured, and traced back to their country of origin.
- Promoting responsible seafood consumption in import countries, so people buy and consume fish supplied according to international and regional standards;
- Ensuring fair trade returns for local stakeholders.

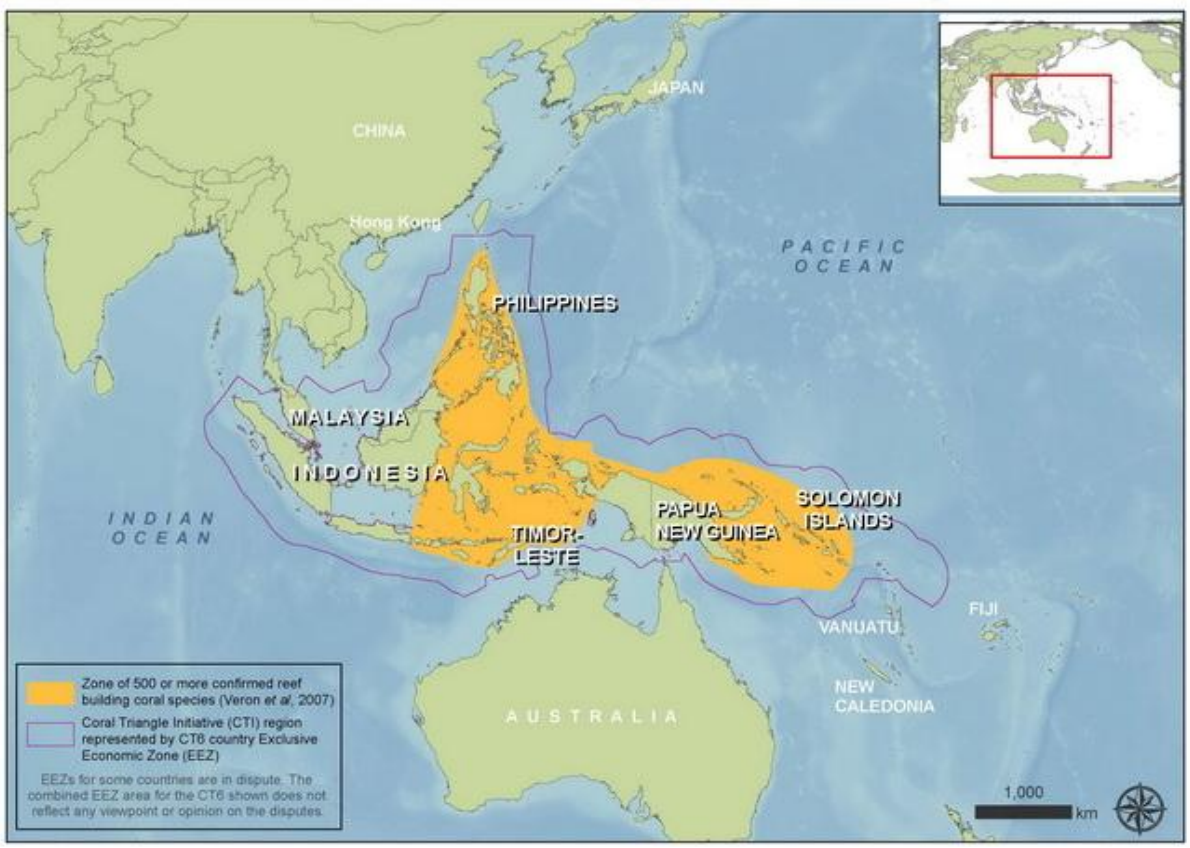
CTI countries could also set up other programmes encompassing various aspects of the LRFFT such establishing an LRFF fishery; trade monitoring activities; public information campaigns; incentive programmes promoting sustainable LRFFT and compliance; and effective enforcement of LRFF fishery-related regulations at national and local levels.

In undertaking the above measures, it is crucial for CTI countries to encourage **cooperation in the following areas**:

- Implementing CTI target objectives and programmes relating to the LRFFT, including developing specific goals and tasks for CTI members to undertake;
- Strengthening cooperation and collaboration between the source (CTI countries) and destination countries (exchange of information, for example);
- Developing a best practice code for CTI countries' LRFFT industries;
- Developing model fisheries provisions (or regulations) to apply to LRFF fisheries;
- Increasing cooperation with international government and non-governmental organizations involved in the study of LRFFT, such as WWF, the Nature Conservancy, TRAFFIC, the World Resources Institute, the Network of Aquaculture Centres in Asia-Pacific, the International Union for Conservation of Nature and the Secretariat of the Pacific Community;
- Collective participation in CITES meetings to promote the listing of threatened reef species (some grouper species, for example) and to strengthen the implementation of regulations for existing CITES listed species (humphead or Napoleon wrasse, for example);
- Study the harmonized application of CITES and other relevant international instruments on LRFFT management in the CTI region and exporting countries;
- Active involvement in international discussions promoting the development of international standards on LRFFT.

Introduction

The Coral Triangle region covers more than 6 million km² of Indonesia, Malaysia, the Philippines, Papua New Guinea, the Solomon Islands and East Timor. It is home to 76 per cent of the world's coral species, six of the world's seven marine turtle species and more than 2,000 reef fish species. According to the WWF, marine and coastal resources of the Coral Triangle directly sustain about 120 million people and the economic benefits from the region are estimated at US$2.4 billion from coral reefs and another US$12 billion from the tourism industry.[1]



Map of the Coral Triangle region © Coral Geographic (Veron et al, unpublished data)

In recognition of the biological and economic importance of the Coral Triangle region, the littoral states within it have established a number of initiatives, individually and collectively, in partnership with NGOs, to address issues related to fisheries resources, the marine environment, biodiversity and climate change. One of these multilateral initiatives is the CTI on Coral Reefs, Fisheries and Food Security, which involves states, the private sector, international organizations and NGOs. The initiative focuses on the sustainable development of the region's marine and coastal resources.

A key issue the CTI addresses is sustainability of the LRFFT. The CTI countries aim to develop a collaborative programme on the management of and international trade in coral reef-based fish and ornamentals, which includes joint research and information sharing. More specifically, CTI countries seek to establish a common regional approach to the management of live reef fish and ornamentals,

[1] WWF. *Coral Triangle: The World's Richest Garden of Corals and Sea Life.*

within an Ecosystem Approach to Fisheries Management (EAFM) framework that can be used to develop national management plans and policies, promoting EAF and sustainable livelihoods.

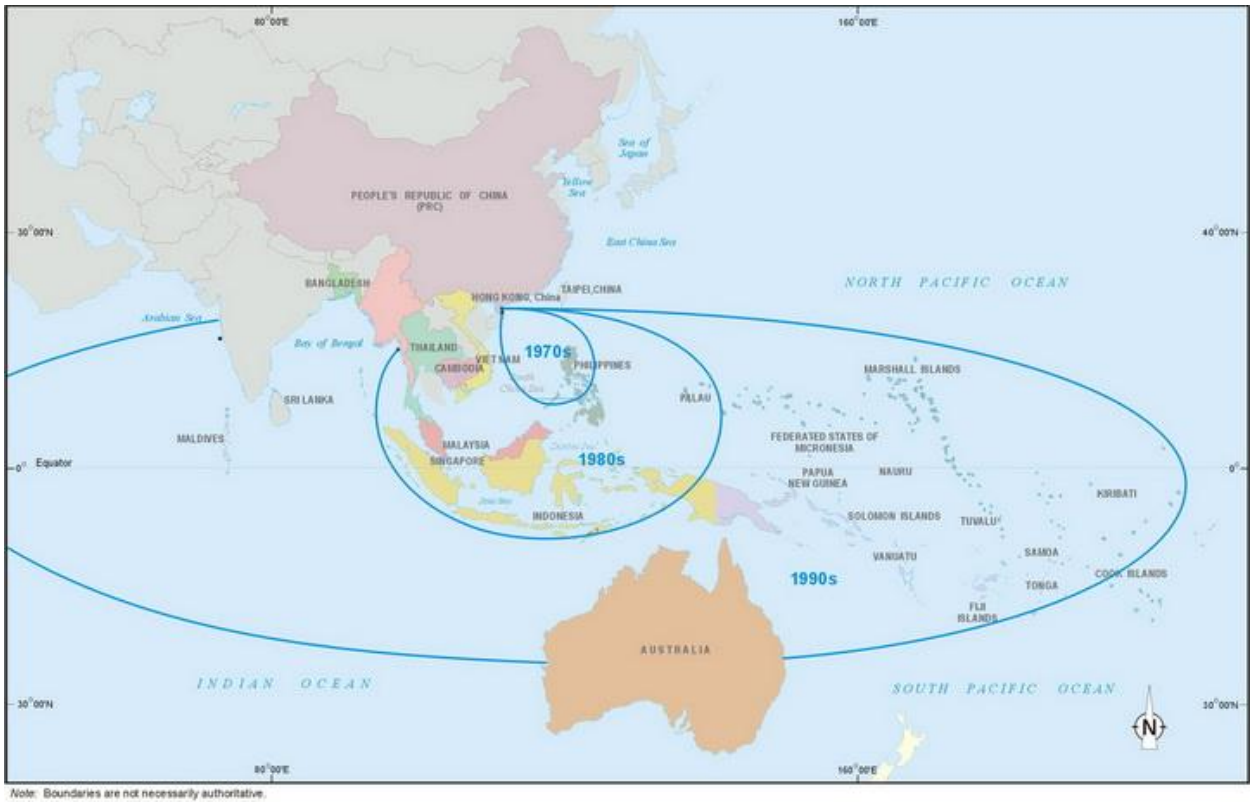
In establishing a common regional framework for the sustainable management of LRFFT, it would be necessary for CTI countries to analyze governing laws and regulations for the capture and trade of live reef fish with respect to the international framework for LRFFT, and identify gaps in each country's legal frameworks. Such examination will enable CTI countries to recommend legal and policy changes, both at the domestic and regional level, to address issues related to the control and management of LRFFT.

This report presents a scoping of relevant laws at the national level in CTI countries with respect to four areas: EAFM, port state measures, trade and market measures, and combating IUU fishing, in the context of LRFFT. It illustrates gaps in legislation and policies in the CTI countries – Indonesia, Malaysia, the Philippines, Papua New Guinea, the Solomon Islands and East Timor.

The report is divided into seven sections: a) nature of LRFFT in the CTI; b) issues of sustainability in LRFFT; c) the CTI management goals for LRFFT; d) international legal and policy framework for LRFFT; e) summary of domestic implementation for the LRFFT in the CTI region; f) trends and gaps in the domestic legal frameworks; and g) options for CTI countries.

The nature of the LRFFT in the Coral Triangle region

Before any assessment of the legal framework can be made, an understanding of the nature of the LRFFT in the Coral Triangle region is essential. In this section we give an insight into the capture, rearing, transport and trade of live reef fish, the various species traded, major importing countries, and economic benefits of the LRFFT. This is valuable in determining whether there are adequate legal and policy measures to manage the trade of live fish. A quick survey of issues and concerns linked to the LRFFT will also help CTI countries identify how they could enhance or develop measures to promote a sustainable LRFFT.



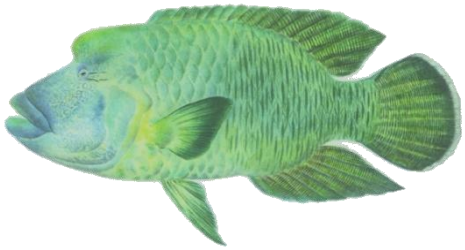
This map represents the geographical scope of the international trade in live reef food fish. The concentric rings illustrate its expansion across Southeast Asia and into the Indo-west Pacific in search of new sources of reef fish, leaving those closer to the markets depleted. © Sadovy et al. 2003

Although the precise nature of the LRFFT remains elusive, projects and research have been conducted to define the characteristics of the trade. In brief, the LRFFT involves the trade of live fish for food, primarily as a luxury food item in restaurants and markets. There are various estimates of the LRFFT's value. The World Bank estimated the LRFFT was worth about US$350 million a year from 1999 to 2002. The World Bank concluded that in 2002, the value of the LRFFT in the Asia Pacific region was over US$810 million.[2] In Sabah (Malaysia), the export value of the LRFFT was

[2] Sadovy, Y. et al. *While Stocks Last: The Live Reef Food Fish Trade*.

estimated at around RM70 million in 2003.[3] In 1997, considered to be the peak of the trade, the annual volume of regional trade was about 50,000 tonnes. However, since then, the regional volume of live reef fish traded is believed to have declined to less than 30,000 tonnes a year.[4] Reef fish that enter the live market are classified into three categories: (1) wild-caught market size fish, which comprise about 50 to 70 per cent of the total trade; (2) undersized fish grown in cages or ponds until they reach market size, making up 15 to 40 per cent of the trade; and (3) fish reared from eggs in aquaculture, which are about 10 to 15 per cent of the trade.[5]

Humpback (highfin) grouper



Humphead (Napoleon) wrasse

Leopard (leopard) coralgrouper

Squaretail (squaretail) coralgrouper

Brown marbled (tiger) grouper

Camouflaged (flowery) grouper

Giant (giant) grouper

[3] Ishak, S., Mohamed, I. and T. Hooi. *Live Reef Fish Trade: Status, Issues and Opportunities for Action*.
[4] Ibid.
[5] Ibid.

Live reef food fish (LRFF) include a wide variety of species of different values. Low-value species include the mangrove snapper, green grouper and flowery grouper. Medium-value species include the tiger grouper, giant grouper, spotted coral trout and leopard coral trout. High-value species include humphead (Napoleon) wrasse and humpback (highfin) grouper.[6] In 2003, these reef fish were sold to restaurants for between HK$150 and HK$990 per kilo. The Napoleon wrasse is the most sought-after. Preferred size for consumption is considered to be about 600 grams to one kilogram depending on the occasion (pers comm. Heru Purnomo). While some species, such as leopard coral trout, can take only a few years to reach that size, other species grow much more slowly. To maintain a viable stock of fish, the most important indicator is size at first maturity. Again some fish, such as the leopard coral trout, reach maturity after only a few years, while others can take several years.[7]

In Indonesia, international trade of reef fish mostly involves species of groupers (Serranidae, particularly species of Plectropomus and Epinephelus) along with smaller quantities of humpback (highfin grouper and Napoleon wrasse).[8] Some of the smaller groupers are produced by catching juveniles in the wild and allowing them to grow out, while larger species (tiger, green and giant groupers, for example) are produced through full or closed cycle aquaculture, reliant only on hatchery-produced fingerlings for grow-out. Papua New Guinea has also been a source for Napoleon wrasse, grouper, coral trout and cod.[9] Transport of live reef fish is mainly by sea or air, depending on the location of the fishing grounds and availability of air links. Table 1 shows the main species involved in the LRFFT.

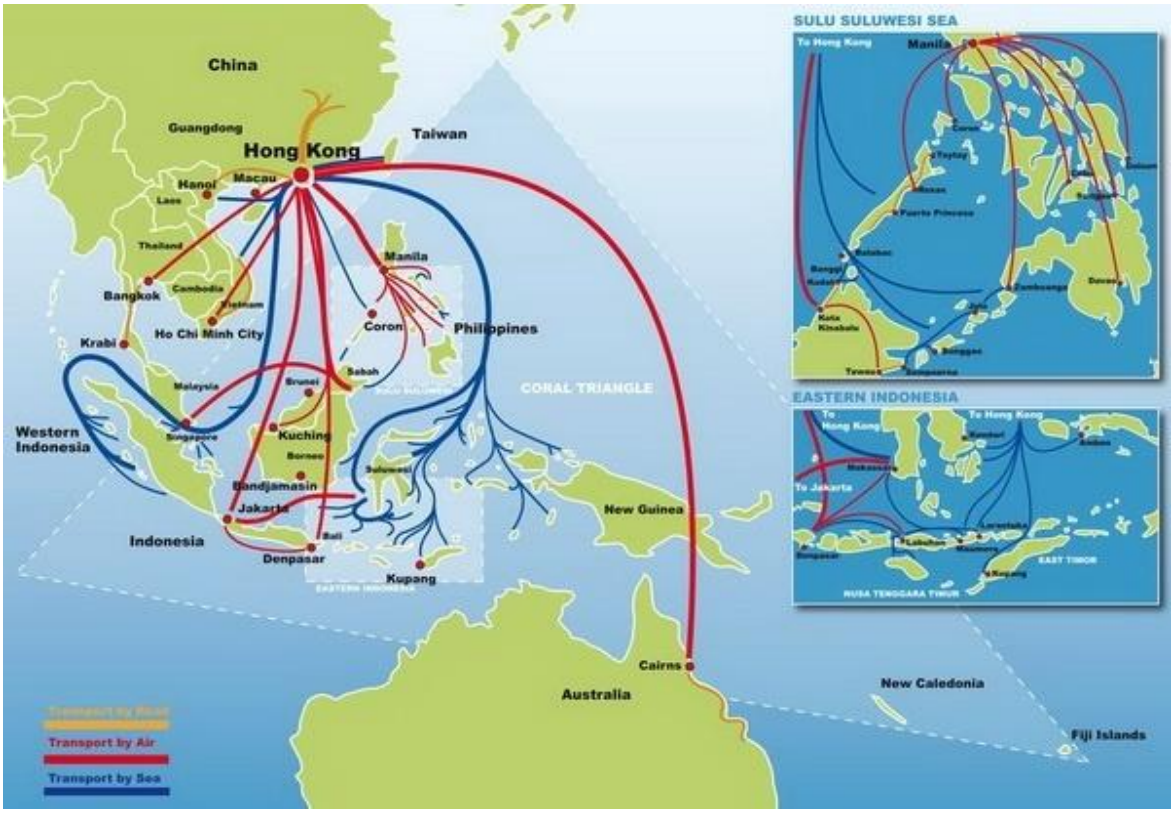
The LRFFT is an export industry for CTI countries. Hong Kong, mainland China, Taiwan and Singapore are the main importing and consuming states. Indonesia, Malaysia, the Philippines and Australia have been key exporters of LRFF for decades. Countries in the South Pacific, such as Papua New Guinea and the Solomon Islands, were previously engaged in the LRFFT when Hong Kong and China were looking for new sources of reef fish to meet growing demand. However, these countries have not actively traded LRFF for years.[10] While key importing and exporting countries are easily identified in the LRFFT, the marketing and trade chain within these countries is much more ambiguous, as it often involves a number of fishers, buyers, retailers, exporters, importers, wholesalers and distributors before the fish reaches target buyers and consumers. The chain also involves collectors of undersized reef fish and fingerling, growers in hatcheries and aquaculture farms.

[6] Petersen, E. Finding Nemo: Estimating Import Demand for Live Reef Food Fish. In: Johnston, B. and Yeeting, B. (eds), *Economics and Marketing of the Live Reef Fish Trade in Asia-Pacific: Proceedings of a Workshop.*
[7] Sadovy, Y. et al. *While Stocks Last: The Live Reef Food Fish Trade*.
[8] Akhmad, F. A Predictive Dynamic Model of Indonesian Live Reef Fish for Food. In: Johnston, B. and Yeeting, B. (eds), *Economics and Marketing of the Live Reef Fish Trade in Asia-Pacific: Proceedings of a Workshop*.
[9] Gisawa, L. Review of the Live Reef Food Fish Fishery Operation and its Management in Papua New Guinea. In: Johnston, B. and Yeeting, B. (eds), *Economics and Marketing of the Live Reef Fish Trade in Asia-Pacific: Proceedings of a Workshop*.
[10] Ibid.

Table 1: Principal species in LRFFT

FAO (common English) name*	Scientific name	Trade status
Humpback (highfin) grouper	*Cromileptes altivelis*	High-value
Humphead (Napoleon) wrasse	*Cheilinus undulatus*	High-value
Leopard (leopard) coralgrouper	*Plectropomus leopardus*	High-value
Squaretail (squaretail) coralgrouper	*Plectropomus areolatus*	Medium-value
Brown marbled (tiger) grouper	*Epinephelus fuscoguttatus*	Other grouper
Camouflaged (flowery) grouper	*Epinephelus polyphekadion*	Other grouper
Orange-spotted (green) grouper	*Epinephelus coioides*	Other grouper
Hong Kong (red) grouper	*Epinephelus akaara*	Other grouper
Giant (giant) grouper	*Epinephelus lanceolatus*	High-value
Spotted (spotted) coralgrouper	*Plectropomus maculatus*	High-value

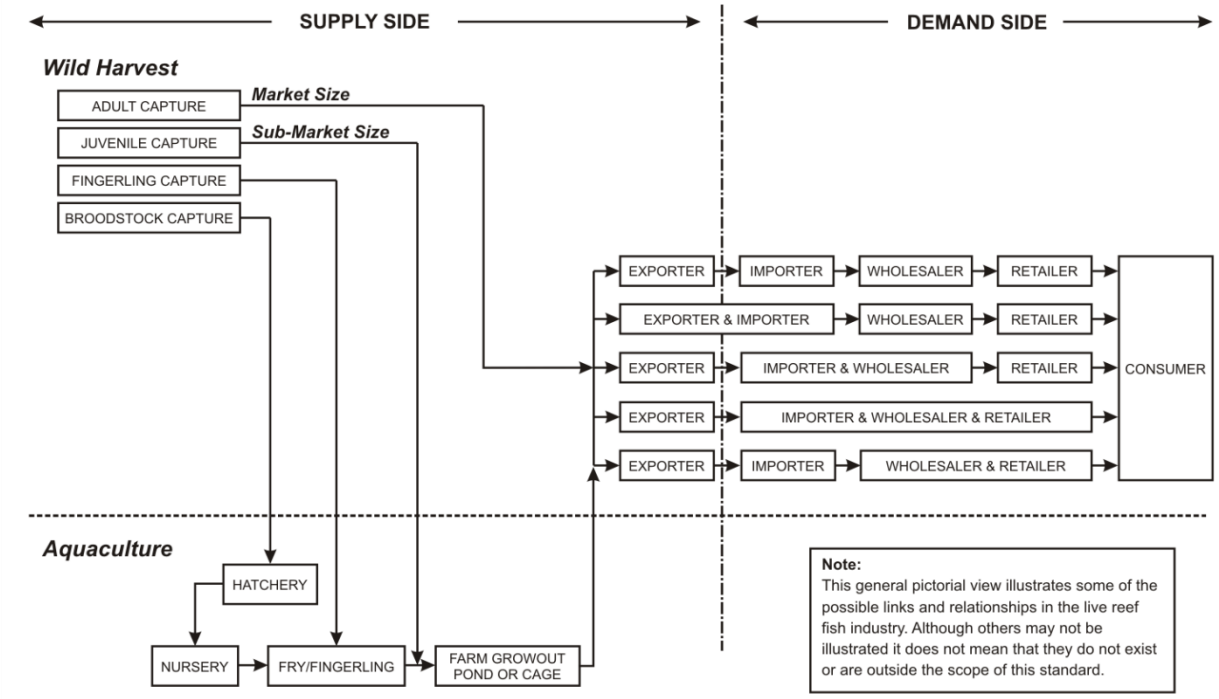
** Standard names of the Food and Agriculture Organization of the United Nations (FAO) have been adopted. Source: Sadovy, Y. et al 2003. While Stocks Last. Asian Development Bank. 43 pp.*



LRFFT routes in Southeast Asia and the Pacific © Geoffrey Muldoon / WWF

Figure 1 depicts the various activities and actors involved in LRFFT.

Figure 1: Diagram of LRFFT activities and actors



Source: The International Standard for the Trade in Live Reef Food Fish (2004)

With this brief description of the LRRFT in the CTI region, it's possible to identify some of the key characteristics which need to be considered in the review of legal and policy framework for sustainable live reef fisheries. These include: (a) the capture and culture components of the fishery; (b) the specific species of target fish; (c) the volume of fish traded; (d) the export nature of the industry in CTI countries; (e) the marketing and trade chain; and (f) the different modes of transport.

Issues of sustainability in the LRFFT

The continuous demand for live reef fish, the methods of obtaining and rearing reef fish and the widening geographic scope of the LRFFT all pose major concerns to make the effective management of the fishery and its trade. Every aspect of the LRFFT, from capture to the point of consumption, involves a number of issues directly affecting sustainable management of the fishery.

Cyanide fishing in coral reef
© Jürgen Freund / WWF-Canon

One major issue is fish capture methods. When catching a reef fish alive, a common method is to stun the fish using cyanide. While cyanide is effective in gathering reef fish, it is a destructive fishing method that can prove fatal to non-target marine organisms and smaller reef fish. Marine habitats may also be vulnerable to lower concentrations of the substance.[11]

Another issue is the capture of juvenile fish in the wild, particularly in spawning and aggregation sites, for the purpose of rearing fish in cages. There is anecdotal evidence of illegal trade in juvenile reef fish in CTI countries including the Philippines, Indonesia and Malaysia.[12] The sheer volume of live reef fish traded in Hong Kong and China is an overriding concern. The high volume of LRFF, combined with other life history characteristics such as slow growth rate and late maturity of some species, contribute to reef fish's increasing vulnerability to overexploitation.

Fish cages for consolidating live reef fish before transportation in Lampung, Sumatra, Indonesia
© Geoffrey Muldoon

While excessive fishing mortality is responsible for declining stocks, mortality of fish during handling and transportation by sea is also of concern. In some places, estimates of mortality during the holding phase are as high as 50 per cent due to a combination of poor cage conditions, feeding regimes and disease.[13] Mortality rates for juveniles being transported for mariculture could be as high as 90 per cent.[14] This forces fishers to capture more live fish to compensate for those dying during holding and

[11] Jones, R. and Steven, A. Effects of Cyanide on Corals in Relation to Cyanide Fishing on Reefs. In: *Mar. Freshwater Res*. 48, 517; Lau, P. and Parry-Jones, R. *The Hong Kong Trade in Live Reef Fish for Food: Executive Summary*; Burke, L., Selig, E. and M Spalding. *Reefs at Risk in Southeast Asia*.
[12] Ishak, S., Mohamed, I. and T. Hooi. *Live Reef Fish Trade: Status, Issues and Opportunities for Action*.
[13] Sadovy, Y. et al. *While Stocks Last: The Live Reef Food Fish Trade*.
[14] Ibid.

transit.[15] The trade of grouper fry and fingerlings across the Asia Pacific for grow-out for the LRFFT is also recognized as causing aquatic animal pathogens to spread within the region.[16] There has been considerable growth in the culture of reef fish for distribution and sale in the LRFFT, with more than half of this production relying on collection of fry, fingerlings and juvenile fish from the wild.[17] Grouper culture has other major environmental impacts, contributing to poor water quality and pollution of adjacent water bodies.

Although we know who the major exporting nations participating in the LRFFT are, the marketing chain and the actors involved in the capture and trade of live reef fish are often not easily or clearly identified. This is caused by a combination of them not wanting to be recognized, as in the case of some traders in exporting and importing countries, and the sheer numbers of participants, as in the case of fishers dispersed across extensive coastal areas. This makes it difficult for governments to implement and enforce measures to regulate and control the LRFFT.

Live reef fish transport vessel © Frazer McGilvray

The LRFFT has been characterized as not paying enough to local fishers,[18] although this is not always strictly true. In Sabah, Malaysia – a major source of LRFF – fishers can earn more than many government officials and financial sector employees. In the Palawan province of the Philippines, the average income of households participating in the LRFFT is estimated at between four and six times the provincial average. That said, despite being a highly lucrative industry, the financial benefits from the international trade of live fish does not necessarily reach local fishers. Their income does not always reflect the trade's profits.

The LRFFT is characterized as largely an unregulated fishery, with "one of the greatest but least quantified sources of fishing pressure in the Indo-Pacific region".[19] There is also lack of accurate trade information and proper reporting of reef fish trade in exporting countries, including all the CTI countries. Most of the data on live reef fish trading comes from Hong Kong authorities. However, it is estimated that as much as a fifth of total LRFF imports into Hong Kong still go unreported.[20] Hong Kong finds it difficult to monitor inbound shipments of live fish, particularly Napoleon wrasse, due to the high volume of marine traffic, multiple landing sites, concealment of fish in boats and Napoleon

[15] Ibid.
[16] Rimmer, M., Phillips, M. and S. Sim. Aquaculture of Groupers in Asia and the Pacific. In: Johnston, B. and Yeeting, B. (eds), *Economics and Marketing of the Live Reef Fish Trade in Asia-Pacific: Proceedings of a Workshop*.
[17] De Silva, S. and Phillips, M. *Status and Trends of Full-Cycle Grouper Aquaculture Production and Trade in the Coral Triangle*. 118pp.
[18] Sadovy, Y. et al. *While Stocks Last: The Live Reef Food Fish Trade*.
[19] Scales, H., Balmford, A. and A. Manica.Impacts of the Live Reef Fish Trade on Populations of Coral Reef Fish off Northern Borneo. In: *Proc. R. Soc. B*(2007) 274, 989.
[20] Lau, P. and Parry-Jones, R. *The Hong Kong Trade in Live Reef Fish for Food: Executive Summary*.

wrasse being mixed with other fish during transportation or mislabelled as groupers.[21] Some imports of Napoleon wrasse into other countries such as China are not documented while shipments to Singapore are neither recorded as re-exports nor marked with countries of origin.[22] But over and above these logistical problems, the reality is that Hong Kong-registered live transport vessels are not required to declare their LRFF imports to authorities.[23]

Lastly, it is worth noting that most regional frameworks on fisheries focus on marine capture of commercially-exploited species such as tuna. But since reef fishing mostly occurs within waters under state jurisdiction, fishing activities are subject to different fisheries management regimes. Most coral reef areas which are habitats for traded reef fish are found in state or provincial waters. Difficulties in data collection and LRFFT management concerns are mainly consequences of disparities and weaknesses in regulatory and enforcement regimes implemented at federal (national) and state (provincial) levels of government.[24]

[21]CITES. *Fifteenth Meeting of the Conference of Parties, Interpretation and Implementation of the Convention, Species Trade and Conservation Issues*.
[22] Ibid.
[23]Muldoon, G. Market chain analysis for the trade in live reef food fish. In: Johnston, B. and Yeeting, B. (eds), *Economics and Marketing of the Live Reef Fish Trade in Asia-Pacific: Proceedings of a Workshop*.
[24] See for example, Fabinyi, M. and Dalabajan, D. Policy and Practice in the Live Reef Fish for Food Trade: A Case Study from Palawan, Philippines. In: *Marine Policy* 35 (2011). 371-378pp.

The CTI and the management of the LRFFT

CTI heads of state at the CTI summit in Manado, Indonesia, 15 May 2009 © WWF

The LRFFT is economically important for Coral Triangle region countries. For decades, various threats have affected the sustainability of species targeted for the LRFFT. That is why CTI countries have agreed to address common concerns, including ecosystem approach to the management of fisheries and other marine resources. Under the Manila and Honiara drafts,[25] one of the CTI's main objectives within the goal of full application of ecosystem approach to fisheries management ecosystem approach is "more effective management and more sustainable trade in live reef fish and reef-based ornamentals". To achieve this objective, the CTI has adopted a number of specific commitments and goals. These include substantial reduction of destructive fishing practices; development of baseline years for use in measurements; identification of target species and methodology of monitoring population levels; determination of quantitative targets and viable population levels of specific live reef fish; establishment of multi-stakeholder forums and dialogues; development of demand-side strategies to promote consumer demand for certified sustainable fish; and development of supply-side strategies to reduce pressure on wild-caught fish through sustainable mariculture.

CTI countries have adopted more specific regional actions to address the LRRFT. These are: (1) developing a collaborative work programme to manage international trade in coral reef-based fish and ornamentals, including jointly supported research, information sharing and strategies for addressing the supply and demand sides of trade; and (2) establishing a CTI Forum on Management of and International Trade in Coral Reef-Based Organisms.

CTI countries' specific activities to implement the first regional action are:

- Development of a common regional framework for management plans and policies on live reef fish and ornamentals that countries can use to develop national management plans and policies, addressing EAFM and livelihood issues;
- Sharing of information on and assessing past and current efforts to address issues related to the sustainable management and trade of LRFF and ornamentals, identifying concrete lessons learned and success factors;
- Joint analysis and development of demand-side strategies, including assessment of opportunities to promote consumer demand for certified sustainable fish;
- Joint analysis and development of supply-side strategies, such as assessments of opportunities to (1) expand mariculture of targeted reef fish and ornamentals (to reduce pressures on wild-caught organisms and associated reefs); (2) introduce certification schemes

[25] Coral Triangle Initiative. *Regional Plan of Action "Manila Draft", Regional Plan of Action "Honiara Draft", Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF).*

and standards at the local level; (3) reduce the use of destructive fishing practices; and (4) increase capacity to meet existing sustainability standards;

- Joint analysis and development of strategies around cross-cutting issues, such as capacity building and sustainable livelihoods.

APEC-endorsed LRFFT workshop in Sanur, Bali, Indonesia, 1-3 March 2011 © Siapul Siagian / WWF-Indonesia

The second regional action, involving the establishment of a CTI forum on the management of the LRFFT, will serve as a dialogue and partnership mechanism to share information, advance work and develop and promote practical solutions for more sustainable trade. This forum, which will incorporate private-public partnerships, should be established in 2012. To that end, a series of meetings involving government, academics, NGOs and industry from CTI countries and demand-side economies, has been convened to push this market-based agenda.[26]

Each CTI country is to develop specific target in line with these objectives and regional actions. Some of the specific actions at the national level which were highlighted by CTI countries include: developing baseline data and standards and management plans for the LRFFT; enforcement of CITES; and establishing no-take replenishment zones for reef fish spawning aggregation sites and marine protected areas.

[26] Martosubroto, P. and Muldoon, G. *Final Report for Workshop on Market-Based Improvements in Live Reef Fish Food Trade*.

International legal and policy framework for the LRFFT

There is no specific framework for the LRFFT management. It can be argued that this is the main weakness when it comes to global cooperation to dealing with threats to the LRFFT's sustainability. Management of the LRFFT falls within the wider framework of international fisheries law. As discussed in this section, parts of international fisheries law and policy are applicable to sustainable management of the LRFFT. These include ecosystem approach to fisheries, port state measures, trade and market measures, and combating IUU fishing. These elements and their inter-linkages are explained below.

Ecosystem Approach to Fisheries

The Ecosystem Approach to Fisheries (EAF) is one of the main principles of sustainable fisheries. A number of international instruments promote EAF. The most widely accepted international agreement that directly promotes the EAF is the Convention on Biological Diversity (CBD). The CBD states that conserving biological diversity requires conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings.[27] In addition to the CBD, there are several international instruments that state the need to include ecosystem considerations in the management of fisheries resources. These include the United Nations Convention on the Law of the Sea (LOSC),[28] the UN Fish Stocks Agreement, the FAO Code of Conduct for Responsible Fisheries[29] and Chapter 17 of Agenda 21.[30] These instruments provide the legal basis for the development of the FAO technical guidelines on ecosystem approach to fisheries,[31] which is a useful guide to the application of the principle to different types of fisheries.

> The **Ecosystem Approach to Fisheries** is an extension of conventional fisheries management, recognizing more explicitly the interdependence between human well-being and ecosystem health and the need to maintain ecosystems productivity for present and future generations, for example, conserving critical habitats, reducing pollution and degradation, minimizing waste and protecting endangered species.
> Source: Ward et al (2002)

LOSC[32] obliges states to consider the ecosystem when managing living marine resources. The preamble of the UN Fish Stocks Agreement directly refers to the need to preserve biodiversity and maintain the integrity of marine ecosystems. Similarly, the FAO Code of Conduct for Responsible Fisheries[33] and Chapter 17 of Agenda 21 set out principles and international standards of behaviour

[27] Convention on Biological Diversity.
[28] United Nations. *United Nations Convention on the Law of the Sea*.
[29] FAO Fisheries Department. The Ecosystem Approach to Fisheries. In: *FAO Technical Guidelines for Responsible Fisheries.*
[30] UN. 1992. *Agenda 21: The UN Programme of Action from Rio*.
[31] Ibid.
[32] United Nations. *United Nations Convention on the Law of the Sea*.
[33] FAO. *Code of Conduct for Responsible Fisheries*.

for responsible practices with a view to ensuring the effective conservation, management and development of living aquatic resources, with due regard to ecosystem and biodiversity. Chapter 17 of Agenda 21 recognizes that problems with the unsustainable use of marine living resources extend beyond fisheries. It identifies marine and coastal ecosystems that states need to protect because of their high diversity and productivity, such as coral reefs, wetlands, seagrass beds, mangroves, estuaries and other spawning areas.[34] Agenda 21 also emphasizes that these marine and coastal ecosystems have important ecological functions, provide coastal protection and are critical resources for food, energy, tourism and economic development – but they are currently under threat.[35]

International agreements providing for an EAF state that conservation and management measures should take into account the interdependence of fish stocks and effects of fishing on species associated with or dependent on harvested species in the exclusive economic zone and the high seas.[36] Fisheries conservation and management approaches should maintain productivity of marine species,[37] address depleted species, and identify the potential of underused and unused populations.[38] More specifically, states are required to take into account the biological unity and other biological characteristics of the stocks and the relationships between the distribution of the stocks, the fisheries and the geographical particularities of the region concerned. This includes the extent to which the stocks occur and are fished in areas under national jurisdiction and in the high seas.[39] International instruments also have measures to promote EAF, including the establishment of a system of protected areas; protection and recovery of threatened and endangered species; prevention of the introduction of alien species; and preservation of fragile ecosystems, such as coral reefs and mangroves.[40] The FAO Code of Conduct also encourages states to collect reliable and accurate data on fisheries and ecosystems, including information on bycatch, discards and waste.[41]

Ecosystem health is not just important in marine and coastal capture fisheries, but also in aquaculture development. The FAO Code of Conduct states that responsible aquaculture promotes ecosystem integrity.[42] It encourages states to protect transboundary aquatic ecosystems by using sustainable aquaculture practices, including choosing species responsibly and taking precautions when introducing non-indigenous species.[43]

[34] United Nations Conference on Environment and Development. Chapter 17. In: *Agenda 21*.
[35] Ibid. Paragraph 17.72.
[36] United Nations. *United Nations Convention on the Law of the Sea.* Articles 61(3), 61(4) and 119(1)(a) and (b); United Nations. *Agreement for the Implementation of the Provision of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks*. Articles 5(d) and (e); United Nations Conference on Environment and Development. Chapter 17. In: *Agenda 21*. Paragraph 17.46.; FAO. *Code of Conduct for Responsible Fisheries*. Paragraphs 6.2. and 7.2.3.
[37] United Nations Conference on Environment and Development. Chapter 17. In: *Agenda 21*. Paragraph 17.7.
[38] Ibid. Paragraph 17.70.
[39] UN. 1995. *The United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks.*
[40] Convention on Biological Diversity. Articles 7-8; United Nations Conference on Environment and Development Chapter 17. In: *Agenda 21*.Paragraphs 17.7. and 17.8.
[41] FAO. *Code of Conduct for Responsible Fisheries*. Article 12.4.
[42] Ibid. Articles 9.1.2. and 9.3.1.
[43] Ibid. Articles 9.2.1., 9.2.2. and 9.2.3.

Napoleon wrasse © Robert Delfs / WWF-Canon

Destroyed reef, Philippine © Jürgen Freund / WWF-Canon

Healthy reef © Cat Holloway / WWF-Canon

The general legal framework for the implementation of the EAF is directly relevant to the LRFFT, both in terms of capture and culture of reef fish. The most relevant obligations under international instruments for CTI countries relate to the preservation of habitats such as coral reefs and spawning areas; protection of threatened species, juveniles and non-target species; prevention of introduction of alien species; and promotion of sustainable aquaculture for reef fish. Implementation of these measures at the national, and especially at the regional level, is expected to achieve effective application of the ecosystem approach in the live reef fishery.

Trade measures

Similarly to international fisheries law, the wider framework of international trade in fish and fishery products governs trade in live reef food fish. Fisheries-, environment- and trade-related instruments cover food safety, food security and sustainability of fisheries resources. All of these are crucial issues for the LRFFT and are addressed in the FAO Code of Conduct, General Agreement on Tariffs and Trade (GATT), CITES and in a number of World Trade Organization (WTO) agreements. In addition to various articles relevant to trade, the FAO Code of Conduct has a general provision stating that the international trade in fish and fishery products should not compromise the sustainable development of fisheries and responsible use of living aquatic resources.[44] This implies that no "live" reef food fish can enter international trade unless it is sourced from sustainable capture methods or fishery.

The FAO Code of Conduct[45] also has a number of measures promoting the safety and quality of fish.[46] Consistent with this, the WTO has adopted a number of agreements, such as the Sanitary and Phyto-sanitary Agreement, and generally accepted codes such as Good Hygiene Practices (GHP), Good Manufacturing Practices, Hazard Analysis Critical Control Point (HACCP), and Codex Alimentarius, which cover the trade of fish, including live reef fish, coming from marine capture and aquaculture. These international instruments and standards provide good guidance for CTI countries to minimize the mortality of wild-caught reef fish and to prevent the spread of fish diseases. However, it would be a good idea to develop guidelines specific to the handling and transport of wild-caught fry and fingerlings, as well as for rearing seed stocks in hatcheries.

Another important instrument for the effective management of LRFF fisheries is CITES.[47] This convention provides for the control of endangered species through a licensing or permit system, which promotes EAF. Although there are only a few aquatic species included in CITES' list of

[44] FAO. *Code of Conduct for Responsible Fisheries*.
[45] Ibid.
[46] Ibid. Articles 11.1.1. and 11.1.2.
[47] Convention on International Trade in Endangered Species of Wild Fauna and Flora.

threatened species, states recognize the convention's increasing role in relation to resources exploited by fisheries in marine and large freshwater areas. Species covered by CITES are listed in three appendices. Appendix I includes species threatened with extinction, where trade is permitted only in exceptional circumstances. Appendix II covers species not necessarily threatened with extinction, but in which trade must be controlled to avoid threatening their survival. Appendix III includes species that are protected in at least one country, and that country has asked other CITES members for help to control trade. In the case of LRFFT, only Napoleon wrasse is listed under Appendix II, meaning that exporting and re-exporting countries can only trade it through a permit system. Such a system cannot be effective without strong cooperation between exporting and importing states.

Trade of CITES species requires management authorities to get advice from a non-detriment finding (NDF) from a scientific authority in the export country before issuing a permit (import or export) or a certificate of "introduction from the sea"[48].

CITES Conference of Parties (CoP) Resolution Conf 8.6 recommends that NDF be based on population status, distribution, population trend, harvest, other biological and ecological factors, and trade information. For Appendix II species, including Napoleon wrasse, an export permit "shall only be granted if the scientific authority of the state of export has advised that such export will not be detrimental to the survival of that species.[49] When a scientific authority determines that the export of such species should be limited, the management authority of the exporting state shall be advised of the suitable measures to limit the grant of exports."

A number of internationally agreed trade- and market-related measures come under the International Plan of Action to Prevent, Deter and Eliminate Illegal, Unregulated and Unreported fishing (IPOA-IUU). This ensures that only fish caught legally enter the international market. As will be discussed in the next sections, this includes import and export controls, traceability of fish, and catch documentation. These may be implemented in transportation hubs such as CTI countries' fish ports and airports.

The use of Port state measures in the LRFFT

Live reef fish for sale at Hong Kong's Aberdeen harbour © Geoffrey Muldoon

Port state measures under international fisheries law generally apply to foreign fishing vessels entering coastal state waters and ports. The LOSC, FAO Code of Conduct, UN Fish Stocks Agreement, the IPOA-IUU, and more recently, the FAO port state Measures Agreement[50] apply minimum port state requirements to foreign fishing vessels. Port state measures include requiring fishing vessels to seek permission before entering ports; designated ports where foreign flagged vessels can be admitted; inspection of fishing vessels

[48] "Introduction from the sea" means transportation into a state of specimens of any species which were taken in the marine environment not under the jurisdiction of any state. See Convention on International Trade in Endangered Species of Wild Fauna and Flora.
[49] Ibid. Article IV.
[50] FAO Council. *Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing.*

(as well as gears, catch and documents) in ports; and enforcement actions such as refusing to land or transship fish in ports, or denial of port entry, except in cases of force majeure.[51] Although these measures are applied to foreign vessels, countries may adopt similar measures to ensure control over the transport and landing of LRFF by domestic vessels. In fact, international instruments do not prevent port states from applying comparable measures to their national vessels.

One inherent characteristic of the LRFFT in the CTI region that may not be adequately covered under the international port state regime for fisheries is the landing and transit of reef fish in local ports. As highlighted earlier, measures implemented in ports may be subject to local (state or provincial) jurisdiction beyond the authority of national government agencies responsible for the international trade of LRFF. This gap in the international framework requires strengthening of mechanisms to ensure effective collaboration between local port authorities and national agencies on reef fish data collection; inspection of relevant fishing licences and catch and health certificates; and adequate enforcement of relevant regulations, among others. Furthermore, the port state regime for fisheries does not cover measures that may be adopted in airports used for the transit and transport of LRFF to destination countries.

Combating IUU fishing in the LRFFT

Illegal fishing vessel intercepted in Indonesian waters
© Kieran Kelleher/Marine Photobank

Another instrument in international fisheries law relevant to addressing issues related to the IUU aspects of the LRFFT is the International Plan of Action for Unregulated and Unreported Fishing (IPOA-IUU). Although not specific to live reef food fisheries, the IPOA-IUU is the main international instrument addressing IUU fishing for all types of marine capture fisheries. Its objective is "to prevent, deter and eliminate IUU fishing by providing states with comprehensive, effective and transparent measures by which to act, including through appropriate regional fisheries management organizations, established in accordance with international law".[52] The IPOA-IUU is considered to be a comprehensive "toolbox" with a full range of measures that all states can use. These include flags states, port states, coastal states, "market states" and states which engage in the international trade in fish to deal with IUU fishing both in states' jurisdiction and in the high seas.[53]

[51] United Nations. *United Nations Convention on the Law of the Sea*. Article 25; United Nations. *Agreement for the Implementation of the Provision of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks.* Article 23; FAO. *Implementation of the International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing.* Paragraphs 52-64; FAO Council. *2009 Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing*.

[52] FAO. *Implementation of the International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing.* Paragraph 8.

[53] FAO. *Code of Conduct for Responsible Fisheries*. Paragraph 16.

Flag state measures, within the context of the LRFFT, include registration of vessels involved in live reef fishery; licensing or authorization to fish; control over transport and support vessels engaged in capture of live reef fish; and recording of LRFF fishing vessels.[54] Flag states are required under the IPOA-IUU to exercise effective control over the activities of their vessels, particularly if they are accessing live reef fish in another country's jurisdiction (for example, the trans-boundary trade of LRFF between the southern Philippines and Sabah, Malaysia). States may apply coastal state measures to foreign fishing vessels engaged in the LRFFT in their jurisdiction. Coastal state measures include licensing and foreign fishing licences imposing specific terms and conditions[55]; and effective monitoring, control and surveillance – such as vessel monitoring systems, observer programmes, logbook recording and data collection.[56]

Port state measures are similar to those discussed in the last section. They involve proper control over foreign vessels' access in port. Port state measures for LRFF include the submission of information before port entry, designation of accredited ports where live reef fish may be landed, inspection of LRFF fishing vessels, and pre-departure requirements. If LRFF is found to have been caught through IUU fishing, a port state may enforce its jurisdiction by refusing its landing or transhipment, or denying the vessel entry.[57] Port states would also need to report the matter to the vessel's flag state. As emphasized in earlier discussions, states generally apply port state measures against IUU fishing to foreign fishing vessels; however, states may apply similar measures to their own vessels to effectively address IUU fishing in the LRFFT.

The IPOA-IUU also provides for internationally agreed market state measures. These can be used to address IUU fishing in the LRFFT. They include the application of import and export controls[58] such as regulations on the sustainability of LRFF pertaining to the type of reef fish that may be traded, permitted quantity, and source (for example, fishing area and method), and other trade restrictions consistent with multilaterally agreed rules. Catch documentation and certification, and measures to promote the traceability of fish, are also examples of trade-related measures CTI members may apply collectively against IUU fishing in the LRFFT.[59] The IPOA-IUU further provides for the adoption of stock-specific or species-specific trade-related measures that may be necessary to reduce or eliminate incentives to engage in IUU fishing.[60] Both port and market state measures are to be applied in a fair, transparent and non-discriminatory manner.

Other measures CTI members may adopt consistent with the IPOA-IUU include relevant instruments for the effective management and trade of LRFF, development of national plans of action, establishment of an effective institutional framework, and application of sanctions. The IPOA-IUU provides for the application of sanctions of sufficient severity to effectively curb illegal LRFF fishing. They also discourage repeat offenders, particularly those using poisonous substances and destructive fishing methods.

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[54] FAO. *Implementation of the International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing.* Paragraphs 34-50.
[55] United Nations. *United Nations Convention on the Law of the Sea*. Article 62(4).
[56] FAO. *Implementation of the International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing.* Paragraph 51.
[57] Ibid. Paragraph 56; FAO. *Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing*. Article 18(1)(b).
[58] Ibid. Paragraph 69.
[59] Ibid. Paragraph 69.
[60] Ibid. Paragraph 70.

Despite the lack of a specific framework devoted to the LRFFT, it can be argued that CTI countries have sufficient measures under international fisheries law to support the implementation of regional objectives to promote the sustainable management of this trade. Individual CTI countries may also adopt these measures to address specific issues confronting their LRFFT industries. What the international framework does not cover adequately is the application of EAF and measures to combat IUU fishing, including port and trade measures within local (state and provincial) waters. These are in the domestic realm. In addition, an effective management framework is necessary to promote sustainable aquaculture for live reef fish. These gaps mean countries need to adopt a compatible framework to address threats to the LRFFT at the local level—from fish capture, culture and transport to trade.

Analysis of domestic framework on the LRFFT

Cages for fish grow-out in Lampung, South Sumatra, Indonesia © Geoffrey Muldoon

We can assess the domestic framework for the effective management of the LRFFT against the provisions of the international instruments relating to EAF, port state measures, trade measures, and measures to address IUU fishing discussed above. This section highlights the key domestic legal and policy measures CTI members have adopted to promote sustainable management of their LRFFTs based on the implementation of these international measures.

Measures adopted include:

- Ecosystem approach to fisheries (for example, conservation of reef fish habitats and spawning areas; protection of threatened or endangered reef fish; protection of juveniles; bans on introducing alien species; and prevention of spread of fish diseases);
- Trade-related measures (for example, export controls (specifically for Napoleon wrasse); catch certification or documentation; measures to minimize mortality of coral reef fish during transport; and health and safety requirements);
- Port state measures (for example, conditions prior to port entry; inspection of fishing vessels; and pre-departure requirements);
- Measures to combat IUU fishing in the LRFFT (for example, registration of fishing vessels; authorization to fish; recording fishing vessels; control over transport and support vessels; effective Monitoring Control and Surveillance; data collection; and application of sufficiently severe sanctions).

While these measures are closely related the management of the LRFFT, the only measure directly relevant for the live reef fishery in the CTI region is the listing of Napoleon wrasse under CITES Appendix II. As we will discuss in the following sections, Malaysia, Indonesia and the Philippines have adopted regulations to restrict the trade of Napoleon wrasse, through export permits, prohibitions, registration of traders, and export quotas based on NDF. The governments of Malaysia

and Indonesia, with help and guidance from CITES, FAO, IUCN, WWF and TRAFFIC, have conducted NDF assessment for Napoleon wrasse export.[61]

Where relevant and available, regulations adopted at the local (state or provincial) level are discussed. The **Annex** presents a matrix of relevant measures provided under domestic laws and regulations in CTI countries.

Malaysia

Malaysia's framework for fisheries has the features necessary to address threats from the LRFFT. In brief, Malaysia has EAF-related measures to protect fish habitats and prevent capture of juvenile fish and endangered species; has a licensing and certification system to regulate trade of species targeted by the LRFFT; and has measures to prevent the introduction of alien species in aquaculture. The country also has measures to protect coastal waters where coral reef fisheries are found, such as regulations on mesh sizes on nets and bans on using explosives and destructive fishing methods.

The Fisheries Act 1985 of Malaysia controls LRFF under aquaculture. The law bans import and export of any live fish, and its transportation to different states in Malaysia without a permit or in breach of any condition provided in a permit (Article 40). While the Act may be used to regulate trade of live fish, it does not necessarily address issues related to the live reef fishery. Instead, it primarily relates to the prevention of fish diseases and introduction of non-indigenous fish species.

To illustrate the typical requirements to transport of live fish – across the federal territories of Labuan, Sabah, and Sarawak to Peninsular Malaysia, importers, exporters and forwarding agents need e-permits. Necessary documents include a copy of permission to sell, rear or breed prohibited fish; details of the exporting company; date, destination and type of commodity; health certificate or certificate of origin; address of the trading company; scientific and common name of the fish; and quantity of fish. For overseas trade, an airway bill and bill of landing are also required. There are additional requirements for the trade of certain fish, such as presentation of separate invoices for ornamental fish and Japanese carp (koi).

Other parts of the Act are also relevant, although indirectly, to the management of the LRFFT. These relate to licensing of fishing vessels, establishment of marine parks and reserves, prohibition of the use of explosives, and fisheries enforcement.

The minister of fisheries also has the power to set regulations on the following areas:

- Licensing, regulation and management of any particular fishery;
- Establishment of closed seasons in respect of specified fishery areas, species of fish, or methods of fishing;

[61] Sadovy, Y. et al. *Stock Assessment Approach for the Napoleon Fish, Cheilinusundulatus, in Indonesia: A Tool for Quota Setting for Data-poor Fisheries under CITES Appendix II Non-Detriment Finding Requirements*; Gillett, R. Monitoring and Management of the Humphead Wrasse, *Cheilinusundulatus*. *FAO Fisheries and Aquaculture Circular No. 1048.* 62pp.

- Limitations on the quantity, size and weight of fish caught and retained or traded;
- Minimum mesh sizes of nets;
- Prohibited fishing areas for all fish or certain species of fish or methods of fishing;
- Landing (sites) of fish;
- Control of the import and export of live fish, and prohibition or control of the import into, or the sale, cultivation or keeping of live fish not indigenous to any part of Malaysia or to Malaysian fisheries waters;
- Control of endangered species of fish.

In addition to the Fisheries Act 1985, the government has adopted policies to promote EAFM, including the National Biodiversity Policy. This promotes the protection of biodiversity in marine areas, particularly the coral reefs.

The government has developed other specific regulations such as banning the taking of sea cucumbers from protected areas,[62] permits for possession and trade of endangered species,[63] and prohibition of fishing within two nautical miles of the coast of some Malaysian territories.[64] Import of certain species of live fish is also banned.[65] Permits are required for the trade of all fish species, especially CITES-listed species. There are also conditions on the import and export of certain fish, such as time restrictions on permits and size restrictions on fish (for example, not less than 150mm for groupers).

Since the listing of Napoleon wrasse in CITES Appendix II, the Department of Fisheries has adopted measures to further restrict trade of this species. In addition to export permits, the government registers Napoleon wrasse traders in Sabah; restricts marketing of live fish only to importing countries which are party to CITES; and imposes fixed quotas (for example, 100 tails per shipment and two shipments per month).[66]

While Malaysia has adopted a number of regulations promoting EAF and controls the trade in species through certification and permits, some areas still need improvement. These include the registration and recording of fishing vessels engaged in all live reef food fisher activities; licensing of aquaculture businesses engaged in the trade of coral reef fish for food; imposition of licence terms and conditions to ensure that only reef fish caught through sustainable fisheries and methods can be traded; and port measures to detect violations relating to the capture, transport and trade of LRFF. Measures to minimize the mortality of reef fish during transport to other local areas or importing countries also seem to be limited.

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[62] Malaysia. 2010. *Fisheries (Protected Area for Sea-Cucumber) Regulations 2010, PU(A) 291/2010, 26 August 2010.*

[63] Malaysia. *Fisheries (Control of Endangered Species of Fish) Regulations 1999, PU(A) 409/1999; Fisheries (Control of Endangered Species of Fish) (Amendment) Regulations 2008, PU(A) 047/2008; International Trade in endangered Species (Permit, Certificate, Registration and Fees) Regulations 2009, PU(A) 459/2009, 24 December 2009.*

[64] Malaysia. *Fisheries (Prohibited Areas) Regulations 1995; Fisheries (Prohibited Areas) (Amendment) Regulations 1998, PU(A) 444/1998; Fisheries (Prohibited Areas) (Amendment) Regulations 2002, PU(A) 381/2002.*

[65] Malaysia. *Fisheries (Prohibition of Import, etc of Fish) Regulations 1990.* Prohibited genus of fish include: serrasalmus/serrasalmo/pygocentrus/catoprian, pygopristis, colosomma/piaractus, mylossoma, mylopus/myleus, pristobrycon, myletes, salmo, onchorynchus, cichla, esox, cichlasoma, acipenser, arapaima, lepisosteus, cherax.

[66] Ishak, S., Mohamed, I. and T. Hooi. 2008. Live Reef Fish Trade: Status, Issues and Opportunities for Action. *MIMA Bulletin* 15 (2008) 61.

The Philippines

Similarly to Malaysia, the Philippines has adopted a number of measures to promote EAF and food safety; introduced a licensing system to protect endangered species; and applies sanctions for fisheries violations. The Philippine Fisheries Code of 1998 provides for the conservation of fisheries resources, including coral reef fisheries, by establishing closed seasons, promoting protection of rare, threatened and endangered species, and other fisheries management measures. More particularly, for the purpose of the LRFFT, the Code bans the use of electricity, explosives and noxious or poisonous substances, such as sodium cyanide, in fishing areas. These are used to kill, stupefy, disable or render fish or fishery species unconscious. However, the use of these substances may be allowed for research, educational or scientific purposes, subject to certain safeguards and conditions endorsed by concerned local governments. The discovery of dynamite, other explosives and chemical compounds on a fishing vessel or in the possession of any fisherfolk, constitutes *prima facie* evidence that the same was used for fishing, in violation of the Philippine Fisheries Code.

Other bans include: fishing in overfished areas or during closed seasons; fishing in fishery reserves, refugia and sanctuaries; fishing or taking of rare, threatened or endangered species; and prohibition of *muro-ami* and other capture gears. There are specific regulations banning *muro-ami* and other fishing methods destructive to coral reefs and other marine habitats. Fine mesh nets aimed at preventing the capture of undersized and juvenile fish are also banned.

To ensure food safety, the Philippines have adopted regulations governing the import and export of fresh, chilled and frozen fish. Any import of fish needs to satisfy sanitary and phyto-sanitary requirements and Hazard Analysis and Critical Control Points (HACCP) standards. A number of documents are required for any imported fish, including the Bureau of Customs Entry Declaration, International Health Certificate, SPS Certificate, Certificate of Origin and Bill of Lading.[67] Imported fish is subject to inspection upon arrival. This involves physical examination, documentary inspection and microbiological analysis. Fish products which do not comply with these requirements are excluded from importation. Similar rules apply to the export of fish, in accordance with HACCP, Sanitation Standard Operating Procedures, and Good Manufacturing Practices. The export of fish generally requires permits and pre-shipment inspection.[68]

There is legislation enabling authorities to examine and dispose of all confiscated fish caught with explosives or noxious/poisonous substances. The apprehending officer has the power to seize, impound and take possession of the fishing vessel, other fishing tools, as well as explosives and noxious substances. Penalties for these violations vary from fines, confiscation of catch and forfeit of equipment and vessels to imprisonment. Section 100 of the Philippine Fisheries Code states that any illegal import or export of fish is subject to eight years imprisonment, a fine of up to PhP80,000 (about US$2,000) and destruction, forfeiture or disposal of the catch.

[67] Philippines. *Fisheries Administrative Order No 195, Series 1999, Rules and Regulations Governing Importation of Fresh/Chilled/Frozen and Fishery Aquatic products.*

[68] Philippines. *Fisheries Administrative Order No 210, Series 2001, Rules and Regulations Governing Exportation of Fresh/Chilled/Frozen and Fishery Aquatic products; Fisheries Administrative Order No 212, Series 2001, Guideline on the implementation of HACCP system.*

Fisheries Administrative Order No. 233 of 2010 on Aquatic Wildlife Conservation lists economically important species. The use, transport and trade of these species, some of which are traded as reef fish for the live trade, require permits such as the Aquatic Wildlife Special Use Permit, CITES Export Permit, CITES Import Permit and CITES Re-export Permit. There is a ban on catching and exporting certain species, such as Napoleon wrasse and various groupers.

Apart from prohibitions on destructive fishing methods, a permit system for endangered species, and food safety requirements for aquaculture products, the Philippines has yet to adopt specific measures on the LRFFT to address gaps in its domestic framework. Its registration and licensing systems, data collection, port state control and other MCS-related measures apply generally to all types of fisheries. They do not adequately address some of the specific threats to the sustainability of the LRFFT.

Indonesia

Similar to other CTI countries, Indonesia has adopted a number of measures on EAF, IUU fishing, port state measures and trading of LRFF. Fisheries Law No 31 of 2004, as amended by Law No 45 of 2009, provides the framework for regulating fishing gears; fishing areas and zones; periods or seasons of fishing; prevention of pollution and degradation of fishery resources and their environment; rehabilitation and enhancement of fishery resources and their environment; establishment of fishery reserves and marine protected areas; and the protection of fish species. More fisheries management efforts are needed to conserve the ecosystem, fish species and fish genetics.[69]

There are port state measures in Indonesia, including the classification of fishing ports according to capacity and economic significance, and ensuring the competence of port authorities with respect to the planning, construction, operation, development and control of fish ports. All fishing vessels and fish transporting vessels are required to land their catch at designated fish ports.[70] Port authorities have the right to inspect documents, fishing gears, fish catch and vessels, and scrutinize the legality of fishing-related documents. All fishing vessels leaving fishing ports are required to obtain sailing permits issued by the harbourmaster. These port measures apply to all types of fishing vessels. No specific regulations exist for vessels involved in the LRFFT.

Trade of fish in Indonesia is subject to a number of requirements. Imported fish must be accompanied by a fish import recommendation; fulfil quarantine requirements; include completed certificate of origin; and have information on pest identification and fish diseases and treatment.[71] A fish import recommendation is based on import risk analysis covering social and economic analysis and contains information such as the names of kinds or varieties; size and quantity of fish; address of exporters and producers and their countries of origin; importing place; and other certificates.[72]

[69] Indonesia. *Fisheries Law No 31 of 2004*. Article 13(1).
[70] Indonesia. *Fisheries Law No 31 of 2004.* Article 41(3).
[71] Indonesia. *Decree of the Minister of Marine Fishery No.KEP.08/MEN/2004 on Importing Fish*. Article 4(2) (as amended).
[72] Indonesia. *KEP.08/MEN/2004.* Article 11 (as amended).

Specific rules apply to the trade of CITES-listed species such as the Napoleon wrasse. For this species, Indonesia has introduced an air-only rule for exports.[73] In Ministerial Decrees adopted in 1995, Napoleon wrasse can only be fished by artisanal fishermen using traditional and environmentally-friendly methods (for example, hook and line and traps) in certain fishing areas with less than 5GT. The size limit for export is between 1kg and 3kg, and those outside the size range can only be captured for culture purposes. No company purchasing or exporting Napoleon wrasse can do so without a permit. The CITES export quota for Indonesia in 2011 is 3,600 Napoleon wrasse specimens – a significant decrease from 8,000 in 2006.[74]

Fisheries regulations in Indonesia require vessel masters to record details of their fishing activities, including transhipment of fish, in a logbook. The master of the fishing vessel is required to report the fish catch and details of the fishing trip to fisheries control officers in designated ports.

Indonesia also implements a fisheries licensing system where authorities issue different types of licences, such as fisheries business licences (SIUP), fishing licences (SIPI) and licences for fish transporting vessels (SIKPI). A SIUP is a written permit a fishing company obtains to carry out fishery business in accordance with the conditions of the licence. A SIPI is a written permit a fishing vessel obtains to conduct fishing. It is an integral part of a SIUP. A SIKPI is a written permit obtained by a fishing vessel to transport fish. All persons involved in fisheries-related businesses are required to comply with certain conditions and requirements, particularly on the use of fishing gears and methods, as well as other fisheries management measures and regulations. Certain endangered species and live reef fish may only be traded if accompanied by proper export certificates.

Fisheries Law No. 31 of 2004 and Law No. 45 of 2009 prohibit a number of illegal fishing activities and provide for their corresponding sanctions. Depending on the type of violation, penalties range from imprisonment for one to six years to a fine between 200 million and 2 billion rupiah. Violations include importing or exporting fish contrary to regulations; fish processing activities which do not comply with requirements for quality assurance and safety of fish products; constructing or importing fishing vessels without prior approval; and leaving port without a sailing permit. If corporations commit violations, management may be punished, and given a fine one-third higher than usual.

 *Papua New Guinea*

The most relevant provision under the Fisheries Management Act 1998 of Papua New Guinea (PNG) relating to the LRFFT is Article 32. This bans the use or possession of poisons, noxious substances or explosives for killing, taking, stunning, stupefying or disabling fish. Landing, selling, dealing or transporting fish taken using these methods is also banned. Punishment for breaking this law includes confiscation of not only the banned items, but also of the fish and fish products, the vessel and vehicle used to transport the fish product.

[73] CITES. *Fifteenth Meeting of the Conference of Parties, Interpretation and Implementation of the Convention, Species Trade and Conservation Issues*.

[74] CITES. *Species Database*.

Under PNG's fisheries regulations, fishing vessels are required to obtain licences before any fishing activity. This requirement generally covers fishing for reef fish. Anyone engaged in any form of fishing (catching, farming, transporting or selling) is required to keep all relevant information, including fishing time and effort, landing, processing, sales, other related transactions, accounts and records (Article 29). The Fisheries Management Act 1998 of PNG provides for a number of prohibitions which may be used to control illegal catching and trade of LRFF. These include fishing for specified classes and sizes of fish, use of certain fishing methods, and the taking of protected or endangered species of fish, such as Napoleon wrasse.

The International Trade (Fauna and Flora) Act 1979 governs trade of endangered fish species. Although most fish species are exempt from this Act, some aquatic species are protected under it. PNG is also protecting biological diversity by strengthening its existing protected areas for terrestrial and marine species, and increasing its protected areas by 10 per cent.[75] Fish caught in PNG bound for export are required to have permits or licences. A notice of export is required for an export shipment, and in some cases, the Director of Fisheries[76] may require prior notification. As at 2002, a 65cm was the minimum size of Napoleon wrasse that could be exported from Papua New Guinea.[77]

For PNG to effectively manage its LRFFT and to implement international fisheries law, it needs to take a number of measures. These include adopting port- and trade-related measures to ensure that only coral reef fish caught through sustainable means are landed in port and may enter the international market. Relevant MCS measures may also be adopted such as the registration and licensing of vessels engaged in the LRFFT, logbook record keeping and requirements to report catch.

Solomon Islands

The Solomon Islands implements a number of regulations addressing EAF, fish trades and illegal aspects of the LRFFT. For example, Article 32 of the Fisheries Act of the Solomon Islands prohibits the import and export of live reef fish into or from the Solomon Islands without the written permission of the Director of Fisheries. Before granting permission for the trade of LRFF, the Director may require its impact to be assessed. In the case of imports, this could look at the possible effect of the release of fish into the wild. For exports, it may look at the potential impact of the harvest and export of live reef fish on the fishery resources of the country. The penalty for contravening this Act is up to S$500,000 (about US$67,500). Any person engaged in the export of fish and fish products is required to keep a record of information about their activities (Article 35).

The Fisheries Act of the Solomon Islands prohibits the illegal import of fish by any person involved in the landing, importation, exportation, transport, selling, receiving and purchasing of any fish taken, possessed, transported or sold contrary to the law of the country (Article 56). This offence is subject to a fine of up to $1 million.

[75] Papua New Guinea. *National Biodiversity and Strategy Action Plan, 2007*.
[76] Papua New Guinea. *Fisheries Management Regulations 2000.* Part VII.
[77] Papua New Guinea. *National Gazette No. G99, June 17, 2002*.

The general conservation and management measures of the Fisheries Act of the Solomon Islands are also relevant to controlling reef fish catch for the LRFFT. For example, Article 24 of the Fisheries Act, on fishing licences, states that in addition to any prescription on fishing vessel licensing, the Director of Fisheries may attach special conditions to any licence, including the type and method of fishing permitted or related activity; the areas within which such fishing is authorized; and the target species and amount of fish authorized to be taken, including any restriction on bycatch. This provision may be specifically used to regulate LRFF fisheries. The Fisheries Act of the Solomon Islands also prohibits the use, carrying and possession of any explosives, poison or other noxious substances.

The Minister of Fisheries has the power to create regulations to control and manage the LRFFT, such as prescribing closed seasons, closed areas, prohibiting specific methods of fishing, as well as implementing standards for the safety of local fishing vessels and fishermen. In particular, the Minister may adopt other regulations under Article 59 that are related to the regulation of the LRFFT. These regulations include:

- Licensing of fish farms and importation of live reef fish;
- Organization and regulation of the marketing and distribution of fish and other aquatic organisms and fish products;
- Controlling the handling, landing and transportation of fish, other aquatic organisms and fish products;
- Prohibiting or regulating the export of specified species of fish, other aquatic organisms and fish, or other aquatic organism products and fish products;
- Methods and procedures to be adopted in relation to fish storage and processing;
- Use of substances and materials in fish processing;
- The inspection of fish processing establishments and fish products;
- Minimum standards in relation to the quality of fish or fish products;
- Penalties for the contravention of any regulation made under this section, which may not exceed a fine of $200,000.

Apart from the Minister of Fisheries, the protection of reef fisheries also comes under the legislative authority of provincial governments. Other laws and policies also promote the protection of marine species and fish habitats, which may include fishing for reef fish and prohibition of the use of noxious substances, such as the Protected Areas Act 2010 (No. 4 of 2010) and the National Biodiversity Strategy and Action Plan for the Solomon Islands 2009.

East Timor

Law No. 12/2004 on Fishing-related Offences prohibits the use of explosives and toxic substances. The use of firearms, explosives or toxic substances as a means of capturing fisheries resources has a penalty of one to five years in prison and a fine from US$300 to US$100,000. Based on this law, fishing for corals and protected species, and fishing in prohibited or protected areas is banned. These offences are punishable by one to five years in prison and a fine from $500 to $500,000. Apart from these measures, there are no other regulations that directly address the LRFFT for East Timor.

Trends and gaps in the domestic legal and policy framework

We can observe a number of trends from fisheries frameworks implemented by CTI countries. There are four key trends in LRFFT management in these countries, which may be summarized as follows:

- *Application of EAF measures.* A number of measures promoting ecosystem approaches to fisheries are entrenched in the fisheries laws and regulations of CTI countries. Some of these measures are directly relevant to protecting target reef fish, habitats and associated ecosystems, such as establishment of marine protected areas and fisheries refugia; regulations for the capture and trade of endangered species; prescribing closed seasons and areas; and prohibiting destructive fishing methods.
- *Trade of live (reef) fish under aquaculture management.* CTI countries have adopted general regulations on the trade of live reef fish based on licensing systems. Such regulations mostly cover live fish coming from aquaculture. Export requirements primarily include obtaining proper certificates and permits (food safety, transport and trade), and precaution on introducing non-indigenous species. It may be noted, however, that the fisheries legislation of the Solomon Islands provides for an additional requirement that allows assessment of potential negative impacts of capture and trade of live reef fish to the country's fishery.
- *Trade of endangered reef fish under CITES.* The trade of endangered species is regulated in CTI countries in accordance with CITES. Legislative measures are in place in these countries to regulate the trade of Napoleon wrasse under Appendix II of CITES. The trade of other species of wrasses and groupers are also protected under domestic legislation, although regulations do not provide for the protection of all live reef fish exported to Hong Kong and other consuming countries.
- *Measures to combat IUU fishing do not specifically address the LRFFT.* CTI countries have adopted a number of flag, coastal, port and market measures to address IUU fishing. However, such measures are applied generally to marine capture fisheries and are not tailored to prevent or deter IUU fishing in live reef fish fisheries. Registration of fishing vessels, issuing authorizations to fish, vessel monitoring systems, observer programmes, logbooks and fisheries data submissions, port state measures, and catch certification are required for major commercial fisheries and vessels. These do not cover vessels and fishers involved in the capture of LRFF.

Considering these trends, the major gap in the domestic fisheries regulations of CTI countries is the lack of comprehensive framework for the management of their LRFF fisheries. However, a number of measures are applicable and useful for the management of the LRFFT as highlighted in the preceding sections. In contrast to the international framework, national fisheries management and regulatory frameworks in the CTI region are relatively strong in aquaculture, which allows for the safety and proper handling of live fish. Regulations on aquaculture also require relevant certificates before live fish can be exported.

The focus of national measures means CTI countries need to adopt new regulations, or strengthen existing ones, for the capture, transport and trade of wild-caught reef fish. Additional port- and trade-related measures are necessary to ensure that only legally-caught LRFF is landed in port, and transported and traded internationally. Furthermore, most CTI fisheries regulations, similar to international instruments, do not provide adequate measures to control the activities of middlemen engaged in the LRFFT. To address IUU fishing in this fishery, it may be necessary for certain MCS tools, such as registration and licensing, logbook systems, and data reporting to be adapted at the local level. Such measures would need to take into account the powers and functions accorded to local governments. Lastly, mechanisms would need to be developed at the local level to encourage sustainable LRFFT and increase public awareness among various stakeholders not to engage with fishers and businesses involved in IUU fishing for LRFF.

Options for more effective management of the LRFFT in the CTI region

Many measures have been proposed to improve the regulatory framework for the LRFFT. These may be considered by CTI countries. In 2001, a number of organizations, including private companies, developed a collaborative strategy to address five key areas of the LRFFT: 1) fisheries and site-based management; 2) demand-side controls; 3) industry development; 4) research and monitoring; and 5) communication and outreach.[78] International standards were developed in 2004 to guide the management and operation of wild-capture LRFF fisheries, LRFF aquaculture, and trading and consumption of LRFF. These international standards take the form of "requirements" addressing management and operational measures associated with the capture, culture and trade of LRFF.[79]

International instruments and various measures proposed by different organizations provide significant guidance to address threats to the capture, culture, transport and trade of LRFF. Some of the options to achieve CTI countries' objectives for sustainable management of the LRFFT are summarized below.

For the **capture of LRFF**, measures may include:

- Developing fisheries management plans for LRFF, taking into account existing fishing rights and the application of key principles such as use of best scientific evidence available, precautionary principle, environmental impact assessment and EAF;
- More effective data collection and periodic assessment of biological status and ecosystems of reef fish;
- Establishing licensing systems to control access to fisheries;
- Prohibition or limits on the amount, species covered and sizes of fish that may be caught;
- Stronger controls on destructive fishing methods;
- Regulations or bans on targeting spawning aggregations or fish in aggregation sites; targeting or retaining immature fish; taking endangered species; and minimizing bycatch;
- Introducing measures to minimize the risk of supplying fish carrying toxins, causing food borne illnesses;
- Monitoring fishing activities through reporting requirements, observer programmes and, if applicable, vessel monitoring systems.

[78] Graham, T. *A Collaborative Strategy to Address the Live Reef Food Fish Trade*.

[79] The Nature Conservancy and Marine Aquarium Council. *The International Standard for the Trade in Live Reef Food Fish.*

Workers sorting live reef fish for export in Kudat, Malaysia © Geoffrey Muldoon

In terms of **LRFF aquaculture**, management measures could include:

- Preference for hatchery-reared fry and fingerlings;
- Introducing conditions that harvesting of wild-caught fry and fingerlings can only occur when it does not damage or negatively impact the sustainability of wild stocks;
- Compliance with applicable international and regional instruments and standards on LRFF aquaculture (food safety and quality and use of chemicals, for example);
- Minimizing post-capture mortality of wild-caught juveniles;
- Effective farm and fish health management practices that minimize risk of spread of fish pathogens;
- Sustainable sourcing of fish feed;
- Selection of aquaculture sites for LRFF that minimize interference with other coastal resource users and damage to habitats;
- Effective waste control and effluent management, and minimization of negative environmental impact.

Unpacking of shipment of live reef fish received in Hong Kong from the Philippines © Geoffrey Muldoon

Measures for the **handling and transport of LRFF** could include:

- Rules to make sure transhipment only occurs in designated areas unless other authorized monitoring arrangements are in place.
- Developing best practices to ensure that handling, holding and distribution facilities are designed, operated and maintained to keep LRFF in optimum condition to reduce waste, losses and spread of pathogens;
- Stricter regulations for the transport of live fish, such as using air-only modes of transport, or adopting equivalent and tighter controls in air and at sea transport.

CTI members should consider the following methods with respect to the **trade and consumption of LRFF**:

- Providing fish health certificates for each shipment of fish;
- Strengthening the licensing system to control the trade of LRFF, including terms and conditions such as a ban or limits on the amount, species covered, and sizes of fish that may be caught;
- Establishing a registration system for active and legal traders;
- Creating a legal requirement for export and import businesses to source fish supplied in accordance with international, regional and national standards on LRFF;
- Applying traceability programmes to ensure that LRFF shipments can be identified as either wild-caught or cultured, and traced back to their country of origin.
- Promoting responsible seafood consumption in import countries, so people buy and consume fish supplied according to international and regional standards;
- Ensuring fair trade returns for local stakeholders.

Coral trout ready for consumption © Geoffrey Muldoon

CTI countries could also set up other programmes encompassing various aspects of LRFFT such establishing an LRFF fishery; trade monitoring activities; public information campaigns; incentive programmes promoting sustainable LRFFT and compliance; and effective enforcement of LRFFT-related regulations at national and local levels.

In undertaking the above measures, it is crucial for CTI countries to encourage **cooperation in the following areas**:

- Implementing CTI target objectives and programmes relating to the LRFFT, including developing specific goals and tasks for CTI members to undertake;
- Strengthening cooperation and collaboration between the source (CTI countries) and destination countries (exchange of information, for example);
- Developing a best practice code for CTI countries' LRFFT industries;
- Developing model fisheries provisions (or regulations) to apply to LRFF fisheries;
- Increasing cooperation with international government and non-governmental organizations involved in the study of the LRFFT, such as WWF, the Nature Conservancy, TRAFFIC, the World Resources Institute, the Network of Aquaculture Centres in Asia-Pacific, the International Union for Conservation of Nature and the Secretariat of the Pacific Community;
- Collective participation in CITES meetings to promote the listing of threatened reef species (some grouper species, for example) and to strengthen the implementation of regulations for existing CITES listed species (humphead or Napoleon wrasse, for example);
- Study the harmonized application of CITES and other relevant international instruments on LRFFT management in the CTI region and exporting countries;
- Active involvement in international discussions promoting the development of international standards on the LRFFT.

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Summary of Relevant Provisions on Ecosystem Approach to Fisheries, Port State Measures, Trade Measures, and Combating IUU Fishing for the Control & Management of Live Reef Fish Trade in the Coral Triangle Region

THE PHILIPPINES

Ecosystem Approach to Fisheries	
General objectives	One of the objectives of the Philippine Fisheries Code is to ensure the rational and sustainable development, management and conservation of the fishery and aquatic resources in Philippine water, including the EEZ and on the adjacent high seas, consistent with the primordial objective of maintaining a sound ecological balance and protecting and enhancing the quality of the environment [Philippine Fisheries Code 1998, s 2(c)].
Declaration of closed seasons	Declaring closed season in any or all Philippine waters outside the boundary of municipal waters and in bays, for conservation and ecological purposes [Philippine Fisheries Code 1998, s 9].
Fish refugia and sanctuaries	Establishing fish refugia and sanctuaries to be administered in the manner to be prescribed by the BFAR, which says at least 25 per cent, but not more than 40 per cent of bays, foreshore lands, continental shelf or any fishing ground shall be set aside for the cultivation of mangroves to strengthen the habitat and the spawning grounds of fish [Philippine Fisheries Code 1998, s 81].
Threatened species	Declaring closed seasons and taking conservation and rehabilitation measures for rare, threatened and endangered species, as it may determine. Banning the fishing and/or taking of rare, threatened and/or endangered species, including their eggs/offspring as identified by existing laws in concurrence with concerned government agencies [Philippine Fisheries Code 1998, s 11].
Invasive alien species	Prohibiting the introduction of foreign finfish, mollusc, crustacean or aquatic plants in Philippine waters without a sound ecological, biological and environmental justification based on scientific studies subject to the bio-safety standard as provided for by existing laws [Philippine Fisheries Code 1998, s 10].
Environmental impact assessment	Requiring all government agencies as well as private corporations, firms and entities who intend to undertake activities or projects which will affect environment quality to prepare a detailed environmental impact statement and secure an environmental compliance certificate before undertaking such development activity [Philippine Fisheries Code 1998, s 12 and 13].

Port state measures	
Landing of catch	Fish caught beyond Philippine waters shall be considered as caught in Philippine waters and therefore not subject to all import duties and taxes only when the same is landed in duly designated fish landings and fish ports in the Philippines. Such catch is required to be landed in authorized landing sites [Philippine Fisheries Code 1998, s 32].
Transhipment of catch in port	Foreign fishing vessels wishing to avail of land, air and sea facilities available in the Philippines to transport fishery products which are caught outside Philippines territorial water shall call only at duly designated government-owned or -controlled regional fish port complexes (Davao Fish Port Complex) after securing clearance from the Department [Philippine Fisheries Code, s 42]. DA-FAO 199 on Guidelines on Fish Transhipment provides that foreign fishing vessels may only tranship fish upon acquisition of proper clearances, permits and notices such as accreditation papers, notice of arrival, a permit to unload fish, a special permit to load fishing paraphernalia and other supplies, and acquisition of a departure clearance [DA-FAO 199, s VII.6].
Trade measures	
Import and export of fish	All imported and exported fish need to satisfy sanitary and phyto-sanitary requirements and HACCP. A number of documents are requirement to accompany imported fish such as the Bureau of Customs entry declaration, international health certificate, SPS certificate, certificate of origin, and bill of landing [DA Fisheries Administrative Order 195]. Similar rules apply to the export of fish, which requires pre-shipment inspection [DA Fisheries Administrative Order 210].
Trade of specific species such as Napoleon wrasse	The use, transport and trade of species, including reef fish, requires permits such as the Aquatic Wildlife Special Use Permit , CITES export permit, CITES import permit, and CITES re-export permit [DA Fisheries Administrative Order 233]. Trade of Napoleon wrasse to other countries is prohibited.
Combating IUU fishing	
Registration of fishing vessels and fisherfolks	Municipal fishing vessels follow a similar procedure for registration as commercial fishing vessels. The documents required for the registration of fishing vessels three GRT and below are: three copies of affidavit of ownership; two colour photos of the watercraft with the owner, preferably appearing in the photo to approximate the vessel size; authenticated photocopy of the official receipt and/or clearance secured from the Philippine National Police (PNP) for the engine; three copies of the notarized deed of sale or transfer, and owner's *barangay* clearance; clearance certifying that the municipal fishing vessel has not been involved in any criminal offence; affidavit of vessel ownership; PNP clearance; and deed of sale or transfer [Implementing Guidelines of Executive order 305, s 5.3]. Once the documentary requirements are fully complied with, a Certificate of Number is issued [Implementing Guidelines of Executive Order 305, s 5.4]. The local government unit (LGU) assigns an official number which corresponds to a code specifying the

	province and which is permanently marked or plated on both sides of the vessel [Implementing Guidelines of Executive Order 305, s 5.6.1]. The LGU ensures that a unique name is assigned to a vessel [Implementing Guidelines of Executive Order 305, s 7 and 8]. A new Certificate of Number is issued if a vessel changes its home port or there are changes in ownership, engine, or name of the fishing vessel [Implementing Guidelines of Executive Order 305, s 5.6.2]. Local government units are required to maintain a registry of municipal fisherfolk who are fishing or may desire to fish in municipal waters for the purpose of determining priorities among them, of limiting entry into the municipal waters, and of monitoring fishing activities and/or other related purposes [RA 8550, s 29]. Such list or registry shall be updated annually or as may be necessary, and shall be posted in barangay halls or other strategic locations where it shall be open to public inspection, for the purpose of validating the correctness and completeness of the list [Philippine Fisheries Code 1998, s 29].
Fishing vessel licensing	The Philippine Fisheries Code 1998 requires fishing vessels to submit the following in their application for a fishing licence: Certificate of Vessel Registry; Certificate of Ownership; Certificate of Inspection; grid map indicating the proposed fishing grounds; picture of the vessel; fishing logbook for registration; approved articles of incorporation; and drawing of fishing gear design and specification [DA-FAO 198, s 5 and 6]. Before a commercial fishing vessel holding a commercial fishing vessel licence may begin fishing operations in Philippine waters, the fishing gear it will use needs to be registered and licensed [Philippine Fisheries Code 1998, s 29]. To renew the Certificate of a Fishing Vessel and Gear Licence, the following is required: a valid Certificate of Inspection; a fishing logbook report or catch effort report; a notarized certification that the vessel has not been involved in any administrative or judicial case; an inspection report on the fishing vessel and gear; and an affidavit stating that the fishing vessel has complied with the provisions of the Philippine Fisheries Code 1998 on the rights and privileges of fish workers [DA-FAO 198, s 15].
Application of sanctions	In the Philippines a fisheries violation is treated primarily as a criminal offence [Act 3815 or the Revised Penal Code], although there are also provisions for the imposition of administrative penalties. Most of the penalties for fisheries violations by commercial fishing vessels are addressed to natural or juridical persons such as the owners, operators, boat captains, master fishers and officers. There is an automatic revocation of licence for the captain or three highest officers of the commercial fishing vessel if they engage in unauthorized fishing [RA 8550, s 86]. In the case of a violation by a fishing vessel owned by a fishing corporation, the penalty is imposed on the chief executive officer, while in the case of a partnership, the managing partner is held liable [RA 8550, s 90(2)]. Sanctions for infringements of Philippine fisheries laws and regulations include imprisonment, monetary penalties, forfeit of vessels, fishing equipment and catch, and suspension or revocation of fishing permits and vessel registration.

Fisheries data reporting	Each commercial fishing vessel is required to keep a daily record of fish catch and spoilage, landing points, and quantity and value of fish caught, and off-loaded for transhipment, sale and/or other disposal. Detailed information must be certified by the vessel's captain and transmitted monthly to the officer or representative of the Department of Agriculture, at the nearest designated landing point [Philippine Fisheries Code 1998, s 38]. All vessels and crafts passing navigational lanes or engaged in fisheries activity are required to contribute to meteorological and other data to assist the Department of Agriculture in the documentation or reporting of information vital to navigation and the fishing industry [Philippine Fisheries Code 1998, s 39].

MALAYSIA

Ecosystem Approach to Fisheries	
Endangered species	No person is allowed to fish for, disturb, harass, catch, kill, take, possess, sell, buy, export or transport any endangered species of fish specified in the schedule of the regulations except with the written permission of the Director-General. Where any specified endangered species of fish is caught or taken unavoidably during fishing, such endangered species of fish shall, if it is alive, be released immediately or, if it is dead, the catching or taking thereof shall be reported to a fisheries officer and the endangered species of fish shall be disposed of in accordance with his directions. The schedules list species of dugongs, whales, whale sharks and clams as endangered species covered under the regulations [Fisheries (Control of Endangered Species of Fish) Regulations 1999, s 2].
Turtles and inland fisheries	The Director-General of Fisheries may, in consultation with the state authority concerned, promote the development and rational management of inland fisheries through: conduct or coordination of research; provision and maintenance of experimental and demonstration aquaculture stations, fish-breeding stations and training centres; provision of advice and technical assistance to the appropriate authorities of the state; publicity and demonstration facilities and other connected services; and provision of advice on measures for the prevention of fish diseases [Fisheries Act, s 37]. The state authority or, in respect of the Federal Territories of Kuala Lumpur and Labuan, the Minister, may make rules specifically or generally for the proper conservation, development, management and regulation of turtles and inland fisheries in any state in Malaysia or in the Federal Territories of Kuala Lumpur and Labuan, as the case may be, and may, in particular, make rules for all or any of the following purposes: to promote and regulate aquaculture in riverine waters and, in particular, provide for the leasing and licensing of lakes, swamps, mining pools and other areas for the cultivation of fish; prescribe standards for the construction and operation of aquaculture establishments (including the size and depth of ponds); measures for the prevention of fish diseases

	and controls over particular species of fish which may be produced by cultivation; provide for the licensing, regulation and management of any particular inland fishery and for the management of turtles; to provide for the licensing of fishing vessels and fishing appliances operating or in use in riverine waters; regulate or prohibit any method of fishing in riverine waters or the use or possession of certain types of traps or nets; prescribe minimum mesh sizes for fishing nets; regulate or prohibit the erection, maintenance, marking and operation of fishing stakes in riverine waters; prescribe the minimum weights and sizes of fish which may be caught in riverine waters for the purpose of sale, processing, consumption or sport, or to prohibit fishing for any prescribed species of fish; prescribe closed seasons for fishing in any designated area, fishing for certain species of fish or fishing using certain methods in riverine waters; to designate prohibited areas for fishing for all or certain species of fish or fishing using certain methods of fishing in riverine waters; for the purpose of the conservation of fish in riverine waters, to regulate and control the construction of any slides, dams or other obstruction, or the removal of sand or gravel or other alteration to the natural environment or habitat of fish; and to designate, prescribe, promote, provide or regulate any other matter for the proper conservation, development, management and regulation of turtles and inland fisheries [Fisheries Act, s 38].
Marine parks and marine reserves	The Minister may establish any area or part of an area in Malaysian fisheries waters as a marine park or marine reserve in order to: afford special protection to the aquatic flora and fauna of such area or part thereof and to protect, preserve and manage the natural breeding grounds and habitat of aquatic life, with particular regard to species of rare or endangered flora and fauna; allow for the natural regeneration of aquatic life in such area or part thereof where such life has been depleted; promote scientific study and research in respect of such area or part thereof; preserve and enhance the pristine state and productivity of such area or part thereof; and regulate recreational and other activities in such area or part thereof to avoid irreversible damage to its environment [Fisheries Act, s 41(1)]. Unless authorized through written permission by the Director-General for Fisheries, the following activities are not allowed in any marine park or marine reserve: fishing or attempts to fish; taking, removing or being in possession of any aquatic animal or aquatic plant or part thereof, whether dead or alive; collecting or possession of any coral, dredges or extracts any sand or gravel, discharges or deposits any pollutant; altering or destruction of natural breeding grounds or habitat of aquatic life, or destroying any aquatic life; constructing or erecting any building or other structure on or over any land or waters within a marine park or marine reserve; anchoring any vessel by dropping any kind of weight on, or by attaching any kind of rope or chain to, any coral, rock or other submerged object; or destroying, defacing or removing any object, whether animate or inanimate, in a marine park or marine reserve [Fisheries Act, s 43(1)].

Port state measures	
Port call and landing	Fish may be landed at any place specified in the licence [Fisheries (Riverine) Rules, s 20]. The master, owner or agent of every vessel intending to call in port shall, not later than 48 hours prior to the estimated time of arrival, notify the port officer of such arrival and shall provide such information as may be required [Port (Sungai Udang) Rules 2004, s 4(1)]. The estimated time of arrival of any vessel shall be updated every 24 hours and the master shall confirm the time of arrival as soon as possible [Port (Sungai Udang) Rules 2004, s 4(2)]. The master of every vessel intending to call in port shall maintain communication in the VHF working channel as may be prescribed in the Port Circular [Port (Sungai Udang) Rules 2004, s 6(1)]. The master of every vessel shall maintain communication at all times during the vessel's stay in port unless notified otherwise by the authorities [Port (Sungai Udang) Rules 2004, s 6(2)].
Port enforcement	Any vessel and crew detained through hot pursuit shall be taken to the nearest or most convenient port and dealt with in accordance with the provisions of the EEZ Act or any applicable written law [EEZ Act, s 27].
Departure from port	The master of any vessel that has been granted port clearance or directed by the port officer to clear his vessel from any location within the port shall take immediate action to leave the port or clear his vessel as directed by the port officer [Port (Sungai Udang) Rules 2004, s 6(1)]. The port control or authority shall take such action necessary to remove any vessel from the berthing or mooring point to another berthing or mooring point when directed by the officer [Port (Sungai Udang) Rules 2004, s 6(2)].
Trade measures	
Trade of cultured live fish	The law prohibits the importation and exportation of live fish, or its transportation to different states in Malaysia without a permit or in breach of any condition provided in a permit (Fisheries Act 1985, Article 40). For the transport of live fish across the federal territories of Labuan, Sabah and Sarawak to Peninsular Malaysia, e-permits are required for importers, exporters and forwarding agents. Some of the documents and information required for the transport of live fish include a copy of permission to sell, rear or breed prohibited fish; details of the exporting company; date, destination and type of commodity; health certificate or certificate of origin; address of the trading company; scientific and common name of the fish; and quantity of the fish. For overseas trade, an airway bill and bill of landing are also required. There are also additional requirements for the trade of certain fish such as presentation of separate invoices for ornamental fish and Japanese carp (koi).
Trade restrictions	The importation of certain species of live fish is also prohibited. Prohibited genus of fish include: serrasalmus/serrasalmo/pygocentrus/catoprian, pygopristis, colosomma/piaractus, mylossoma, mylopus/myleus, pristobrycon, myletes, salmo, onchorynchus, cichla, esox, cichlasoma, acipenser, arapaima, lepisosteus, cherax [Fisheries (Prohibition of Import, etc of Fish) Regulations 1990].

Trade of CITES species	Permits are required for the trade of fish species, especially for CITES species. There are also conditions for the importation and exportation of certain fish such as the time restrictions of permits and size restriction of fish traded (for example, not less than 150mm for groupers). For Napoleon wrasse (protected under CITES Appendix II), measures have been adopted mainly by the Department of Fisheries Sabah to restrict the trade of this species. These include export permits, registration of Napoleon wrasse traders in Sabah, marketing of live fish only in importing countries which are party to CITES and imposition of fixed quotas (for example, 100 tails/shipment and two shipments/month).
Combating IUU fishing	
Fishing vessel licensing	An application for a licence for any new national fishing vessel should be made to the Director-General before construction of the vessel commences, and shall be accompanied by plans, specifications or other information as the Director-General may require or as may be prescribed in regulations made under the Act [Fisheries Act 1985, s 9(1)]. The applicant may proceed with the construction of the new fishing vessel upon receiving written approval from the Director-General subject to such conditions, including horsepower, size and tonnage of the vessel, or disposal of any existing fishing vessel, as may be specified in the approval [Fisheries Act, s 9(2)]. The Director-General may refuse to issue a licence in respect of any new fishing vessel which was not constructed with approval or not in accordance with the conditions specified, [s 9(3)] or if under a fisheries plan it is provided that no licence shall be issued in respect of a new fishing vessel for a specified type of fisheries unless such new fishing vessel is in replacement of a fishing vessel already issued with such licence or permit for such type of fisheries [s 9(4)]. Every applicant for a local fishing vessel licence shall produce his vessel for inspection by the Director-General at such place and at such time as he may direct [Fisheries (Licensing of Local Fishing Vessel) Regulations 1985, s 3]. Inspection is done to ensure that such vessel is seaworthy and is equipped with the life-saving and fire-fighting equipments and is proper for the purpose of fishing in accordance with the condition of a licence issued [Fisheries (Licensing of Local Fishing Vessel) Regulations 1985, s 4]. A fishing licence is generally valid for a period of not more than 12 months [Fisheries Act, s 14(1)] and is non-transferable [Fisheries Act, s 14(4)(a) and 14(2)(b)]. Every local fishing vessel licence issued is required to have the following particulars: the name and address of the owner and master of the vessel; length, breadth, depth and gross tonnage of the vessel; nationality and the number of crews to be employed; and the number of the National Registration Identity Card of the owner and master of the vessel [Fisheries (Licensing of Local Fishing Vessel) Regulations 1985, s 6].

	The owner of every local fishing vessel shall at the time of application for a licence produce his National Registration Identity Card to the Director-General who shall enter the number of such identity card on the licence and in the appropriate register [Fisheries (Licensing of Local fishing Vessel) Regulations, s 8]. The holder of any local fishing vessel licence is required to report to the Director-General any change in the ownership of such vessel and the Director-General will take such action to cancel the licence. Any such cancellation shall be endorsed in the register [Fisheries (Licensing of Local fishing Vessel) Regulations, s 9]. The owner of every licensed fishing vessel shall, prior to the issuance of the licence, cause the licence number of the vessel to be painted, marked or affixed on each side of such vessel or elsewhere as the Director-General may direct and the permanent number assigned to the vessel by the Director-General shall be carved or branded on the main beam or other conspicuous part of the such vessel [Fisheries (Licensing of Local Fishing Vessel) Regulations, s 10(1)]. The owner of every licensed fishing vessel is required to report to the Director-General any change of address, sale, breaking up or loss of the vessel, collision or serious damage through collision or otherwise, or the laying up of such vessel for repairs [Fisheries (Licensing of Local Fishing Vessel) Regulations, s 15(1)]. No fishing vessel is allowed to ply or go beyond the limits specified in the licence issued for the operation of a fishing appliance, fishing stake or marine culture system [Fisheries (Licensing of Local Fishing Vessel) Regulations, s 17]. Every licensed fishing vessel when under way should be adequately manned to the satisfaction of the Director-General for Fisheries [Fisheries (Licensing of Local Fishing Vessel) Regulations, s 19]. No licence shall be issued in respect of any fishing stakes, fishing appliance, fish aggregation device or marine culture system which causes or is likely to cause any obstruction to navigation or any impediment to the natural flow of water in Malaysian fisheries waters [Fisheries Act, s 11(2)]. The Director-General may also issue a licence in respect of any local fishing vessel, fishing stakes, fishing appliance, fish aggregating device or marine culture system subject to the conditions as he thinks fit [Fisheries Act, s 11(1)]. The Director-General for Fisheries may impose the following conditions as he thinks fit in issuing a licence: • The permanent marking of the fishing vessel with such letters and numbers or other means of identification as prescribed in regulations; • The nationality and number of persons to be employed or carried on the fishing vessel; • In addition to complying with the requirement of any other written law that may be applicable, the requirement that a person who is not a Malaysian citizen shall not engage in any fishing activity related to the fishing vessel without the written approval of the Director-General [Fisheries Act, s 10(1)].

	The Director-General for Fisheries may vary the conditions of a licence but due notice of such intended variation shall be given to the licencee who shall, if he so desires, have the right to be heard within such period as the Director-General may allow [Fisheries Act, s 10(2)].
Application of sanctions	Depending on the type of offence, penalties for fisheries violations include: monetary penalties from 100-20,000 ringgits; confiscation of fishing appliances and catch; revocation and cancellation of or refusal to be issued a fishing licence; forfeiture and disposal of the vessel, vehicle or article used in committing the fisheries offence (including its equipment, furniture, appurtenances, stores, cargo and fishing appliance) [Fisheries Act, Part V, [Fisheries (Cockles Conservation and Culture) Regulations 2002, s 3(2)]. The Director-General may refuse to issue or renew any licence or may cancel, or suspend for such period as he thinks fit, any licence issued under the Act where he is satisfied that it is necessary to do so for the proper management of any particular fishery in accordance with the fisheries plan applicable to that fishery [Fisheries Act, s 13(1)]. The Director-General must refuse to issue a licence in respect of any local fishing vessel in any of the following cases: • Where the vessel is required to be registered under the law relating to merchant shipping but has not been so registered; • Where the vessel is required to have a valid certificate of inspection issued in respect of it under the law relating to merchant shipping but does not have such certificate; • Where the vessel is not seaworthy and not fit for the purpose of fishing or does not comply with such requirements as may be applicable to it in respect of navigation, manning standards or safety at sea under this Act or any other law or under any convention to which Malaysia is a party [Fisheries Act, s 13(2)]. • Where there is a breach of any condition of the permit issued in respect of a foreign fishing vessel (a) its owner and master shall each be guilty of an offence and liable to a fine not exceeding 100,000 ringgit each; and (b) every member of the crew of that vessel shall also be guilty of an offence and liable to a fine not exceeding 5,000 ringgit each [Fisheries Act, s 19(5)]. Any person who brings into or has in his possession, custody or control in Malaysian fisheries waters fish taken or received from a foreign fishing vessel shall, unless he is authorized in writing so to do by the Director-General, be guilty of an offence [Fisheries Act, s 20]. The Director-General may cancel or suspend any permit (a) where there has been any contravention of any provision of this Act or any condition in the permit; or (b) where he is satisfied that such action is necessary or expedient for the proper management of fisheries [Fisheries Act, s 21]. Where there has been a contravention of any provision of the Fisheries Act, the owner, master and every member of the crew of the foreign fishing vessel concerned is considered responsible of any contravention of the provisions of the Fisheries Act 1985 in respect of shall each be guilty of an offence [Fisheries Act, s 23]. The onus of proving that a fishing vessel is not a foreign fishing vessel shall lie with the person charged with the offence in relation to which the issue arises [Fisheries Act, s 24(3)].

	Any fish or fishing appliance or other equipment for fishing found on board a foreign fishing vessel in Malaysian fisheries waters, such as fish, fishing appliance or equipment, as the case may be, shall be presumed, unless the contrary is proved (i) to have been caught in Malaysian fisheries waters; or (ii) to have been used for fishing in Malaysian fisheries waters, respectively without a permit issued under the Act [Fisheries Act, s 56]. Any person who is guilty of an offence under the EEZ Act for which no punishment is provided shall be liable to a fine not exceeding one million ringgit [EEZ Act, s 29]. Where any offence under this Act or any applicable written law has been committed by a company, partnership, form or business, every director and every officer of the company directly connected with the activity resulting in the commission of the offence, every member of that partnership and every person concerned with the management of that firm or business shall each be guilty of that offence and shall be liable to the punishment provided in section 29 [EEZ Act, s 30]. Where an offence under the EEZ Act or any applicable written law has been committed by any person on board a vessel, the master of such vessel shall also be guilty of that offence [EEZ Act, s 31]. In the case of detention and forfeiture of vessel [EEZ Act, s 32], an authorized officer or the court may release the article, vessel or thing so detained upon the furnishing of a bond or other security to the satisfaction of the authorized officer or the court by any person claiming ownership, or acting on behalf of the owner, of the article, vessel or thing to produce the same when required so to do [EEZ Act, s 32(1)].

INDONESIA

Ecosystem Approach to Fisheries	
General measures	To support fisheries management policy, the Minister for Fisheries is required to establish types, quantity and size of fishing gears, areas, zones and period or seasons for fishing, fish culture and its protection, prevention of pollution and degradation of fishery resources and its environment, rehabilitation and enhancement of fishery resources and its environment, fishery reserves, and protected fish species, etc. [Fisheries Law No. 31 of 2004, Article 7(1)]. The Minister is required to determine protected fish species and protected sea areas, including national marine protected areas for the benefit of science, culture, tourism, and/or preservation of fisheries resources and/or its environment [Fisheries Law No. 31 of 2004, Article 7(5)]. Fisheries management efforts are required to be carried out on the conservation of the ecosystem, fish species and fish genetics [Fisheries Law No. 31 of 2004, Article 13(1)].

Port state measures	
General provision	The Minister determines (a) the master plan for fishing ports at the national level; (b) classification of fishing ports and an area which is part of particular marine and land areas to become working and operational areas of the fishing port; (c) requirements and/or technical standards and accreditation of competence in the planning, construction, operation, development and control of fishing ports; (d) working areas and the operation of fishing ports and (e) fishing ports that are not constructed by the government [Fisheries Law No. 31 of 2004, Article 41(2)]. The harbourmaster also has the right to re-inspect the completion and legality of fishing vessel documents and re-inspect fishing gears of the fishing vessels [Fisheries Law No. 31 of 2004, Article 42(3)].
Designation of ports	All fishing vessels and fish transporting vessels are required to land their catch at designated fishing ports [Fisheries Law No. 31 of 2004, Article 41(3)].
Licences and permits	All fishing vessels intending to conduct fishery activities shall obtain a certificate of fishing vessels operational appropriateness issued by the fishery control officer [Fisheries Law No. 31 of 2004, Article 43]. All fishing vessels which sail out of a fishing port are required to obtain sailing permits issued by the harbourmaster [Fisheries Law No. 31 of 2004, Article 42(2)].
Trade measures	
Import of fish	The importation of fish to Indonesia is required to: (a) be accompanied by fish import recommendation; (b) fulfil quarantine requirements; (c) have a completed certificate of origin; (d) be accompanied by information on pest identification and fish diseases and treatment [Decree of the Minister of Marine Fishery No. KEP.08/MEN/2004 on Importing Fish, Article 4(2)]. A fish import recommendation is based on import risk analysis covering social and economic analysis [Decree of the Minister of Marine Fishery No. KEP.08/MEN/2004 on Importing Fish, Article 6(2)] and should contain the following information: names of kinds or varieties; size and quantity of fish; address of exporters and producers and their countries of origin; importing place; and other certificates [Decree of the Minister of Marine Fishery No. KEP.08/MEN/2004 on Importing Fish, Article 11].

Trade in Napoleon wrasse	Indonesia has introduced an air-only rule for exports. In Ministerial Decrees adopted in 1995, Napoleon wrasse can only be fished by artisanal fishermen through traditional and environmentally-friendly methods (for example, hook and line and traps) in certain fishing areas with less than five GT. The size limit for export is between 1kg and 3kg, and those outside the size range can only be captured for culture purposes. No company purchasing or exporting such fish can do so without a permit. The CITES export quota for Indonesia in 2011 is 3,600 Napoleon wrasse specimens.
Combating IUU Fishing	
Fishing vessel licensing	Indonesian legislation provides for the issuance of fisheries business licences (SIUP), fishing licences (SIPI) and licences for fish transporting vessel (SIKPI). A SIUP is a written permit which is obtained by a fishing company to carry out fishery business through the utilization of production facilities specified in the licence [Fisheries Law No. 31 of 2004, Article 1(16)]. A SIPI is a written permit which is obtained by a fishing vessel to conduct fishing. It is an integral part of SIUP [Fisheries Law No. 31 of 2004, Article 1(17)]. A SIKPI is a written permit which is obtained by a fishing vessel to transport fish [Fisheries Law No. 31 of 2004, Article 1(18)]. All persons involved in fisheries-related business are required to comply with the following: • Types, quantity and size of fishing gears; • Types, quantity, size and position of supporting fishing gears; • Areas, zones and period or seasons for fishing; • Requirements or standard operational procedure for capture fisheries; • Monitoring system of fishing vessels; • New fish species to be cultured; • Fish species and areas for restocking and fishing on the basis of fish culture; • Fish culture and its protection; • Prevention of pollution and degradation of fishery resources and its environment; • Size or minimum weight of fish species that are allowed to be caught; • Fishery reserves; • Epidemic and epidemic areas of fish disease; • Fish species that are prohibited to be traded, imported to and exported from the territory of Indonesia; • Protected fish species [Fisheries Law No. 31 of 2004, Article 7(2)].

Application of sanctions	Depending on the type of violation, penalties range from imprisonment from one to six years and fines from 200 million to 2 billion rupiahs. Violations include importing or exporting of fish contrary to regulations, fish processing activities which do not comply with requirements for quality assurance and safety of fish products, constructing or importing fishing vessels without prior approval and sails out without a sailing permit. If violations are committed by corporations, the punishment may be imposed to the management and the fine will be one-third more than usual [Fisheries Law No. 31 of 2004, Article 101]. For example, fishing without SIPI could lead to six years imprisonment and a fine of a maximum of 20 billion rupiahs [Fisheries Law No. 31 of 2004, Article 93(2)]. All persons who are in possession of and/or operate fishing vessels and/or fish transporting vessels which do not load and unload their catch at the designated fishing ports shall get administrative punishment in the form of notices, freezing of licences, or removal of licences [Fisheries Law No. 31 of 2004, Article 41(4)]. According to the law on the IEEZ, sanctions for violators in the EEZ include capture of the vessels and/or persons, detaining vessels and taking the vessel into the nearest port for further investigation [Law No. 5 on the Indonesian EEZ, Article 13; Criminal Code Procedure]. A request for bail may be accepted if the party has paid the proper sum to the court [Law No. 5 on the IEEZ, s 15(2)]. Catch may also be confiscated [Law No. 5 on the IEEZ, s 16(2)].
Fisheries data collection and reporting	Fisheries regulations in Indonesia require the vessel master to record details of their fishing activities, including transhipment of fish in a logbook [Decision of the Minister of Marine Affairs and Fisheries No 3/2002, Article 5]. The master of the fishing vessel is required to report its fish catch and details of the fishing trip to fisheries control officers in designated ports [Decision of the Minister of Marine Affairs and Fisheries No 3/2002, Article 7(1)]. The details of the fishing trip, together with information on the transhipment of catch are required to be recorded in a logbook [Decision of the Minister of Marine Affairs and Fisheries No 3/2002, Article 7(1)].

PAPUA NEW GUINEA

Ecosystem Approach to Fisheries	
General objectives	The fisheries management objectives under the PNG Fisheries Management Act 1991 related to ecosystem management are: • Promotion of the objective of optimum utilization and long-term sustainable development of living resources and the need to utilize living resources to achieve economic growth, human resource development and employment creation and a sound ecological balance; • Conservation of living resources for both present and future generations;

	• Ensuring that management measures are based on the best scientific evidence available, and are designed to maintain or restore stocks at levels capable of producing maximum sustainable yield, as qualified by relevant environmental and economic factors including fishing patterns, the interdependence of stocks and generally recommended international minimum standards; • Application of a precautionary approach to the management and development of aquatic living resources; • Protection of the ecosystem as a whole, including species which are not targeted for exploitation, and the general marine and aquatic environment; and • Preservation of biodiversity [Fisheries Management Act 1998, s 25].
Port state measures	
Designation of ports	The Minister may, by notice in the National Gazette, declare any place to be a designated port for the purposes of the Fisheries Management Act 1998 [s 2(4)].
Specific port requirements	A foreign licensed vessel is required to make a port call for the purposes of inspection at a designated port at the commencement of each licence period [Fisheries Management Regulations 2000, s 24(1)]. Where a foreign licensed vessel is departing from the zone during any fishing trip, and the vessel intends to return to the zone and continue the particular fishing trip, the vessel must have installed, carry and operate equipment provided for a vessel monitoring system [Fisheries Management Regulations 2000, s 24(2)]. A port call must be made for the purpose of inspection by a fishery officer and certified in writing by a fishery officer, and include refuelling and other provisioning to the satisfaction of the certifying officer [Fisheries Management Regulations 2000, s 24(3) and (5)] A licensed foreign fishing vessel, other than a vessel licensed by an administrator under any access agreement which specifically excludes the provisions of this section, must make not less than one port call per year at a designated port in addition to a port call at the beginning of any licence period [Fisheries Management Regulations 2000, s 24(4)]. A foreign licensed vessel is required to make a port call for the purposes of inspection at a designated port at the commencement of each licensing period [Fisheries Management Regulations 2000, s 24(1) and (3)]. A vessel is required to make not less than one port call per year at a designated port (which included refuelling and other provisioning) in addition to a port call the beginning of any licence period [s 24(4) and (5)]. All purse seine vessels are required to make four port calls a year, the first for a pre-trip inspection and the remaining for landing, re-supply and repair purposes.

	A port call form must be submitted to the National Fisheries Authority detailing catch on board and purpose of visit. In addition, if the landing is to a reefer vessel, that reefer vessel must also report activity details including the eventual destination of tuna. For tuna that is sold a Sales Return Form detailing vessel, port, date, species and value, is required to be submitted.
Transhipment in port	Transhipment may also be carried out by a foreign fishing vessel in conjunction with a port call [Fisheries Management Regulations 2000, s 25(5)]. Foreign fishing vessels may only tranship at a designated port authorized for transhipment and subject to terms and conditions prescribed by the Fisheries Management Act 1988 [s 39], Fisheries Management Regulations, and any applicable access agreement [Fisheries Management Regulations 2000, s 25(4)]. Transhipment of fish may be carried out in conjunction with a port call [Fisheries Management Regulations 2000, s 25(5)]. Transhipment notice must be provided 48 hours in advance. Any vessel operator who intends to tranship fish in fisheries waters is required to lodge a notice of transhipment from time to time required by the Managing Director in an approved form prior to and upon completion of any transhipment [Fisheries Management Regulations 2000, s 25(3)]. The operator of a foreign fishing vessel is required to provide reports on transhipment activities prescribed by the Managing Director [Fisheries Management Act 1988, s 39]. A person transhipping fish from a foreign fishing vessel in accordance with the Fisheries Management Act may, upon completion of the transhipment, apply to a Fishery Officer to certify the transhipment, and where the Fishery Officer is satisfied that the transhipment has been carried out in accordance with the Act and the Fisheries Management Regulation, he shall certify the transhipment report accordingly [Fisheries Management Regulations 2000, s 25(6)]. A transhipment notice should provide the following: vessel name; vessel licence number; category of report; tranship to vessel in port; tranship to port facility; tonnes to be transhipped; name of port; and destination of catch.
Trade measures	
Import of fish	Importation of fish that has been taken against the law of another state is prohibited [Fisheries Management Act, s 75].
Export of fish	A person who has exported fish must, within the time after the date of shipment specified in the licence, or as required by the Managing Director, provide to the Managing Director a Notice of Export in such form and at such time as may be approved by the Managing Director [Fisheries Management Regulations 2000, s 31(1)]. The requirement to obtain a Notice of Export is applied to: (a) fish taken from the fisheries waters, and from the High Seas; (b) fish that are imported into the country and are not held in bond, which are stored, prepared or processed for export or re-export; (c) fish taken outside of Papua New Guinea fisheries waters by a vessel licensed under this Regulation to fish in Papua New Guinea fisheries waters, and transhipped in a

	port other than a Papua New Guinea port. No licensed Papua New Guinea fishing vessel can carry or export fish taken in the fisheries waters out of Papua New Guinea unless the licence is issued under a multilateral access agreement and provided that where a Papua New Guinea vessel fishing by the purse seine method, fishes in the fisheries waters of another state, it shall be entitled to export fish taken by this method in such waters [Fisheries Management Regulations 2000, s 30(1)]. The Managing Director may require prior notification of export from any specified fishery, in relation to any species of fish, or from any licence holder. [Fisheries Management Regulations 2000, s 31(2)].
Trade in Napoleon wrasse	Papua New Guinea imposes a 65cm minimum size limit in the trade of Napoleon wrasse [*National Gazette No. G99*, 2002].
Combating IUU fishing	
Fishing vessel licensing	Licences are granted in accordance with the Fisheries Management Act [Fisheries Management Act 1998, s 41(1)]. The operator of each licensed vessel is subject to and must ensure compliance with the following licence terms and conditions: • The vessel shall at all times fly its national flag; • The vessel shall hold a valid registration issued by the flag state and shall not be registered in any other state; • The vessel shall display markings in accordance with approval given by the Managing Director; • The continuous monitoring of the international distress and calling frequency 2182 Khz (HF), and the international safety and calling frequency 156.8 MHz (channel 16, VHF-FM) to facilitate communication with the authority; • That a recent and up-to-date copy of International Code of Signals (INTECO) is carried on board and accessible at all times; • That a recent and up-to-date set of charts showing Papua New Guinea fisheries waters is carried on board at all times; • That such position-fixing, identification and vessel monitoring system equipment as may be required is installed, maintained and fully operational at all times as may be required; • Compliance with all laws of Papua New Guinea, the terms and conditions of any applicable licence and any applicable access agreement; • Compliance with all relevant provisions of national law relating to navigational standards and the safety of vessels at sea; • That there is full compliance with such other licence terms and conditions as may be prescribed or otherwise specified in accordance with the Fisheries Management Act [Fisheries Management Act 1998, s 43(3)]. A fishing vessel licence issued in accordance with the Fisheries Management Act must contain such terms and conditions and: • Must be issued for a specified type, class or species of fish;

	• Must be issued for a specified area of fisheries waters; • Must specify which types of fishing and related activities are permitted under the licence; • Must specify a port or ports at which the vessel may tranship, offload, re-fuel or re-provision; • Must specify such further conditions in relation to any fishing permitted under the licence, including any applicable conditions in relation to total allowable catch, as are necessary or desirable; • Must specify the number of citizens who are to be employed as crew aboard the vessel during the licence period; • Must require that a specified type of automatic location communicator of a vessel monitoring system be installed on the vessel and fully operational at all times during the licence period whether the vessel is operating inside the zone, or on the high seas, and further require full responsibility for the operational and maintenance costs and full co-operation with the authority in its operation, provided that foreign licensed vessels shall, where required under regional or international agreements or arrangements, comply with this provision; • Must be endorsed in respect of any support craft carried on board and any aircraft used for any fishing operation; • May require the placement of observers or such scientists and technicians as may be required by the Managing Director to be on the vessel for scientific purposes; • Must impose conditions relating to the operation of fish aggregating devices, including the requirement to limit the number of such devices allowed under any licence, and may include conditions relating to the area of development; • May require that the fishing vessel is seaworthy and contains adequate life safety equipment or survival gear for each passenger and crew member; • Shall be subject to such further terms and conditions as are specified in it in accordance with the Fisheries Management Act [Fisheries Management Regulations 2000, s 3(2)].
Application of sanctions	Sanctions for fisheries violations include monetary penalties of up to K1 million, imprisonment of up to 10 years, revocation or suspension of a fishing licence, and seizure and forfeiture of fishing vessels, gears and fish catch. In any proceedings for an offence related to fishing with explosives or poisonous substances, a certificate in writing stating the cause of death or injury of any fish shall be *prima facie* evidence of that fact [Fisheries Management Act 1998, s 32(4)]. Any explosive, poison or other noxious substance found on board any fishing vessel are presumed to be intended for the purposes of fishing using these prohibited substances [Fisheries Management Act 1998, s 32(5)]. All fish or fish products seized under this section are confiscated, and any vessel or vehicle used to transport such fish or fish products may be confiscated, and disposed of in such manner as the Managing Director determines [Fisheries Management Act 1998, s 32(6)]. Where a court convicts a person of an offence related to obstructing observers on board, the court may, in addition to any other penalty, order that that person be banned from going or remaining on board any fishing vessel in the fisheries waters for a

	specified period of time, not to exceed five years [Fisheries Management Act 1998, s 55(3)]. Where a court convicts a person of an offence against the Fisheries Management Act, the court may order the forfeiture of any or all of the following: • Any fish, fish product, vessel (including its gear, furniture, appurtenances, stores, cargo and aircraft), vehicle, aircraft, gear, equipment, explosive or noxious substance taken, used or otherwise involved in the commission of the offence; • Where a vessel, vehicle or aircraft was used in the commission of the offence, any fish on board the vessel, vehicle or aircraft at the time of the offence; • Where any fish has been sold under Section 63(3), the proceeds of the sale of the fish [Fisheries Management Act 1998, s 62(1)]. • Where a court convicts a person of a fisheries offence, in the commission of which a foreign fishing vessel was used or otherwise involved, the court shall order the forfeiture of the vessel; any gear and other equipment that was on the vessel concerned at the time of the notice; all fish or fish products on board the vessel at the time of the offence, or where the fish or fish products have been sold, the proceeds of the sale [Fisheries Management Act 1998, s 62]. All fish found on board any fishing vessel which has been used in the commission of an offence under this Act shall be presumed to have been caught during the commission of that offence, unless the contrary is proved [Fisheries Management Act 1998, s 71(1)]. Where, in any proceedings under this Act, a person is charged with having committed an offence involving an act for which a licence or other permission is required, the burden shall be on that person to prove that the relevant time the requisite licence or permission was held [Fisheries Management Act 1998, s 72]. Where the flag state registry or the ownership of a licensed vessel changes, or it is established that a licensed vessel has more than one flag state registration, or change of ownership has not been approved, any current licence in respect of the vessel is automatically terminated [Fisheries Management Regulations 2000, s 20(1)]. Where the good standing of a licensed vessel is withdrawn, any current licence in respect of the vessel is automatically terminated [Fisheries Management Regulations 2000, s 20].
Fisheries data collection and reporting	The master or other operator of a licensed fishing vessel shall: • Complete daily in the English language, a catch report of all fishing activities in the fisheries waters; • Certify that the information in the catch report is true, complete and accurate; • Take all measures to ensure that information or data which may be required to be transmitted by an automatic location communicator is transmitted continuously, accurately and effectively to the designated receiver [Fisheries Management

	Regulations 2000, s 23(1)]. A catch report must include information and data as required from time to time by the Managing Director in an approved form and as required by the terms of the licence, the Act and any applicable access agreement [Fisheries Management Regulations 2000, s 23(2)]. The master or other operator of a licensed fishing vessel is required to submit to the authority, in a form and by a means approved by the Managing Director, reports during and/or at the end of fishing trips, or at the completion of each month, as he shall require, in an approved form, and in addition, produce any report required under the Act or this Regulation on demand to a Fishery Officer [Fisheries Management Regulations 2000, s 23(3)]. The Managing Director may require such other reports in respect of any vessel as he may deem necessary: • For fisheries conservation and management; • For any activity licensed under the Act or this Regulation; • To implement or enforce the provisions of the Act or this Regulation, any access agreement or fisheries management agreement [Fisheries Management Regulations 2000, s 23]. To implement the Torres Strait Protected Zone Act, the master of a licensed fishing boat or licensed factory ship must, in each day, during which, or part of which, the fishing boat or factory ship is engaged in the activities for which it is licensed, enter into the appropriate folio of the logbook all information that is required to complete each folio of the logbook for each respective activity. The information required must be entered not later than the day immediately following the day. [Fisheries (Torres Strait Protected Zone) Regulation 1987, s 8]. The master of a licensed fishing boat or licensed factory ship shall, at the end of each calendar month, be required to forward to the Departmental Head each completed folio of the logbook, in accordance with the requirements set out in the logbook [Fisheries (Torres Strait Protected Zone) Regulation 1987, s 8].

Solomon Islands

Ecosystem Approach to Fisheries	
General objectives	Ecosystem-related objectives are embedded in the Fisheries Act of the Solomon Islands, which provides principles such as: • The principle that Solomon Islands fisheries resources shall be managed, developed and conserved so as to ensure through proper conservation and management measures that the maintenance of those resources are not endangered by over-exploitation and are utilized at a level that shall ensure their optimum sustainable yield;

	• The principle that the marine biodiversity, coastal and aquatic environments of the Solomon Islands shall be protected and managed in a sustainable manner; • The application of the precautionary approach to protect the fisheries resources and preserve the marine environment; • The sustainable utilization of Solomon Islands fisheries resources so as to achieve economic growth, human resource development, employment creation and a sound ecological balance, consistent with its national development objectives; • Any customary rights of customary rights holders over or in relation to any area within Solomon Islands waters [Fisheries Act 1998, Article 4]. The national and provincial governments may adopt a number of measures such as open or closed seasons for fishing; closure of any areas in which fishing for all or any species of aquatic organisms may be prohibited; prescribing minimum mesh sizes for nets and minimum species sizes; prohibiting specified methods of fishing that are harmful to fisheries and the environment; establishment and protection of marine reserves; and regulating and prohibiting the destruction of mangroves [Fisheries Act 1998, Article 4] The precautionary approach is applied to the conservation, management and exploitation of fisheries resources in order to protect the resources and preserve the marine environment [Fisheries Act 1998, Article 11].
General prohibitions	The protection of reef fisheries comes under the authority of the national and provincial governments. Other laws and policies also promote the protection of marine species and fish habitats, which may include fishing for reef fish and prohibition of the use of noxious substances [Protected Areas Act 2010 (No. 4 of 2010), National Biodiversity Strategy and Action Plan for the Solomon Islands 2009].

Port state measures	
Inspection in port	The Fisheries Act 1998 provides that any authorized officer may inspect the documents, fishing gear and catch, on board a foreign fishing vessel when such vessel is in port [Fisheries Act, Article 55].
Port enforcement action	Any vessel and crew seized shall be taken to the nearest or most convenient port and the vessel may be detained pending the outcome of any legal proceedings under the Fisheries Act or its release on bond or other form of security [Fisheries Act 1998, Article 38(4)].
Trade measures	
General provision	The regulation on the importation of live fish is one of the powers of the Minister of Fisheries [Fisheries Act, 32].
Trade impact assessment	The Solomon Islands prohibits the importation and exportation of live fish into or from the Solomon Islands without the written permission of the Director of Fisheries. Before granting any permission for the trade of live fish, the Director may require an assessment to be made on the live fish. In the case of imports, an assessment could be made on the possible effect of the release of fish into the wild. For exports, one assessment that may be required is the potential impact of the harvest and export of the live fish on the fishery resources of the country. The penalty for contravening this act is up to $500,000. [Fisheries Act, Article 32].
Illegal trade in fish	The Fisheries Act of the Solomon Islands prohibits the illegal import of fish by any person involved in the landing, importation, exportation, transport, selling, receiving, and purchasing any fish taken, possessed, transported or sold contrary to the law of the country. This offence is subject to a fine not exceeding $1 million [Fisheries Act, Article 56].
Combating IUU fishing	
Fishing vessel licensing	No local fishing vessel shall be used for commercial fishing or related activities in Solomon Islands waters without a valid licence [Fisheries Act, Article 14]. In addition to any prescription on fishing vessel licensing, the Director of Fisheries may provide special conditions to any licence, including the type and method of fishing or related activity; the areas within which such fishing are authorized; and the target species and amount of fish authorized to be taken including any restriction on bycatch [Fisheries Act, Article 24].
Application of sanctions	The Fisheries Act of the Solomon Islands also prohibits the use, carrying, possession of any explosives, poison or other noxious substances. [Fisheries Act 1998, Article 31]

Fisheries data collection and reporting	A fisheries management plan developed by the Director of Fisheries shall specify the information and other data required to be given or reported for effective management and development of fisheries resources [Fisheries Act 1998, Article 7] Some of the measures required of the flag state of the foreign vessel fishing in Solomon Island waters are: the recording of and timely reporting of vessel position, catch of target and non-target species, fishing effort and other relevant fisheries data; and verifying the catch of target and non-target species through observer programmes, inspection schemes, unloading reports, supervision of transhipment and monitoring of landed catches and market statistics [Fisheries Act 1998, Articles 54(2)(e) and (f)].

East Timor

Ecosystem Approach to Fisheries	
Fishing for corals and protected species	Fishing for corals and protected species or fishing in prohibited or protected areas are prohibited and are punishable by one to five years of imprisonment and a fine ranging from $500 to $500,000 [Law No 12/2004 on Fishing-related Offences].
Other prohibitions	The use of firearms, explosives or toxic substances as means of capturing fisheries resources is punishable with a penalty of one to five years of imprisonment and a fine ranging from $300 up to $100,000 [Law No 12/2004 on Fishing-related Offences].
Combating IUU fishing	
Application of sanctions	Illegal fishing activities are punishable by both administrative and criminal sanctions (see above).

The Coral Triangle in numbers

US$ 1 Billion

Annual tuna trade from Indonesia, Papua New Guinea, Philippines. Solomon Islands, and Fiji

+120 Million

People directly dependent on the Coral Triangle's marine natural resources

6M+ Square KM

Total area of the Coral Triangle

37%

of known reef fish species

76%

of known coral reef species on the planet

6 of 7

of the world's marine turtle species

US$ 810 Million

Annual regional trade in live reed food fish in Asia-Pacific

WWF

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To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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