



WWF

REPORT

DECEMBER

2009

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A photograph of a fisherman wearing a light-colored long-sleeved shirt, khaki shorts, and a cap, standing on a wooden pier. He is holding a large net filled with several large fish, likely snappers. The background shows a body of water with other piers and buildings in the distance under a blue sky with some clouds.

# Towards a More Sustainable Live Reef Food Fish Trade in the Coral Triangle: First Regional Workshop

Geoffrey Muldoon, Raoul Cola, and Lida-Pet Soede

This document is prepared by the WWF Coral Triangle Program with financial support from the United States Department of State. This report captures a sharing of views among the participants and does not necessarily represent those of the U.S. Department of State, its management, or staff, and may be preliminary in nature.

# **TOWARDS A MORE SUSTAINABLE LIVE REEF FOOD FISH TRADE IN THE CORAL TRIANGLE: FIRST REGIONAL WORKSHOP**

## **WORKSHOP REPORT**

**Geoffrey Muldoon, Raoul Cola, and Lida Pet-Soede  
25 December 2009**

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## ABBREVIATIONS

APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of South-east Asian Nations
BFAR	Bureau Fisheries and Aquatic Resources, Philippines
BIMP-EAGA	Brunei, Indonesia, Malaysia, and the Philippines-East ASEAN Growth Area
BMP	Best Management Practices
CITES	Convention on International Trade in Endangered Species
CPUE	Catch per unit effort
CTSP	Coral Triangle Support Program
CTNI	Coral Triangle Network Initiative
CTI	Coral Triangle Initiative
DOF	Department of Fisheries, Sabah, Malaysia
FAO	Food and Agriculture Organization
ICRI	International Coral Reef Initiative
IUU	Illegal, Unregulated and Unreported
LRFF	Live Reef Fish Food
LRFFT	Live Reef Fish Food Trade
NGO	Non-government organization
MMAF	Ministry of Marine Affairs and Fisheries, Indonesia
MPA	Marine Protected Area
MT	Metric Ton
PCSD	Palawan Council for Sustainable Development
SPAGS	Spawning Population Aggregation Sites
SSME	Sulu-Sulawesi Marine Eco-region
TOR	Terms of Reference
US	United States
USCTI	US Coral Triangle Initiative
WWF	World-Wide Fund for Nature

## 1. Introduction

With funding support from the U.S. Department of State, a three-day workshop was held in Hong Kong from the 10<sup>th</sup> to 12<sup>th</sup> November 2009. This workshop was also supported by the ICRI Secretariat as part of its regional program and as a deliverable under the U.S.-Mexico ICRI workshop (see Appendix 1 for Terms of Reference).

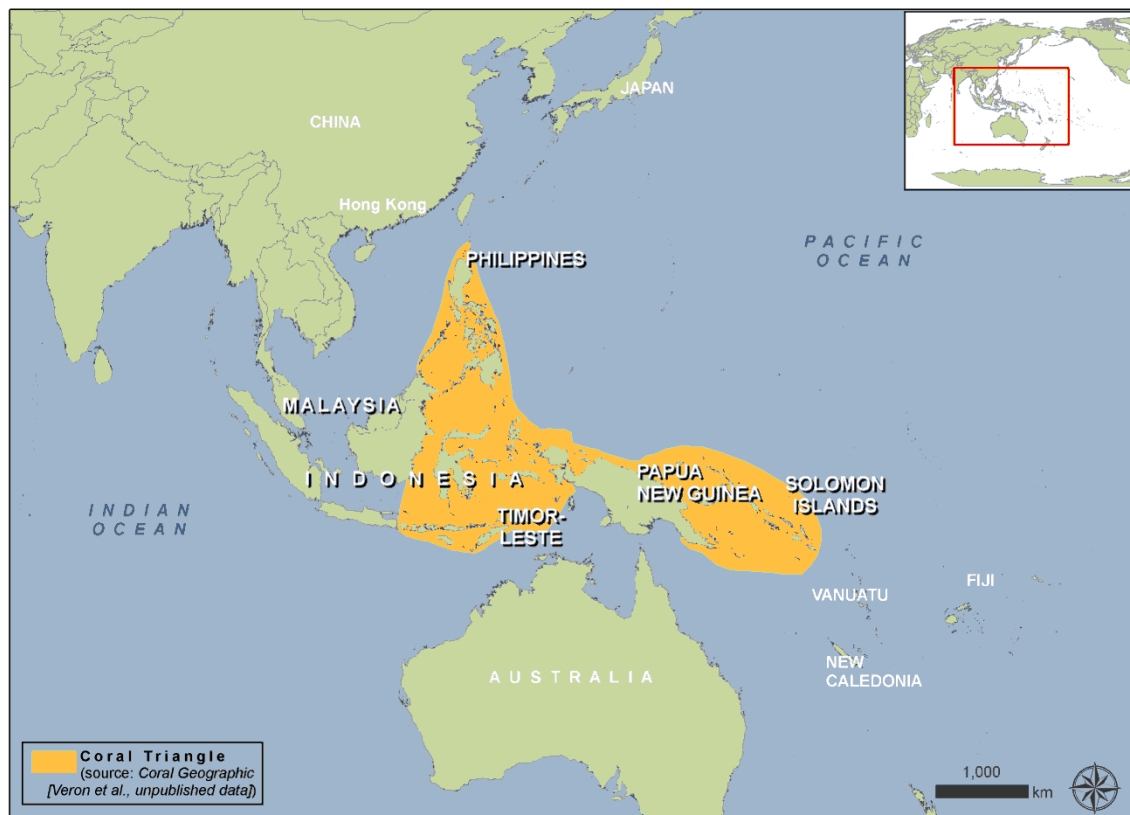
This funding was used to convene a technical workshop, focused on bringing together practitioners to present the most up-to-date information on the Live Reef Food Fish Trade and to outline a roadmap and strategy to address the unsustainable aspects of the live reef food fish trade. The workshop was organized and conducted to identify and prioritize key gaps in knowledge and regulation and to define a roadmap and strategies to address this unsustainable trade. Specific goals of the workshop were to:

1. Provide a snapshot of the current status and trends for the LRFT and to share information on past and current efforts at national and regional scales to address issues related to the sustainable management of the LRFT. The emphasis will be on communicating the most up to date information and identifying existing knowledge gaps. Presentations will cover:
  - a. trade data trends for major source and consumer countries, price trends and market demand forecasting;
  - b. Status of targeted species, including vulnerable and endangered species;
  - c. Current policies and regulations and associated monitoring and enforcement, including multi-lateral agreements and new initiatives;
  - d. Trends in mariculture production including full-cycle and capture-based mariculture;
2. Identify lessons learned and factors contributing to the successes and failures of past and current LRFT programs and explore reasons why efforts to date have not resulted in sustainable management;
3. To jointly explore, develop and analyze demand-side and supply-side strategies at national and regional scales that can strengthen partnerships between governments, NGO's, institutions and the private sector; and to review existing *International Standards for the Live Reef Food Fish Trade* (Muldoon and Scott, 2005) ([www.livefoodfishtrade.org](http://www.livefoodfishtrade.org)) to determine current applicability and development of guidelines on best practices for managers and policy makers, including EAFM,
4. Present a series of recommendations consistent with and that build upon the Coral Triangle Initiative Regional Plan of Action and which are consistent with the goals and objectives of the current Secretariat of the International Coral Reef Initiative



## 2. Background

The Coral Triangle's extensive and highly productive reef systems are the foundation of its marine biodiversity, considered to be the world's richest. This *nursery of the seas* harbors 75 percent of the world's coral species and more than 40 percent of its coral reef fish species. These reef fish species however, are symbolic of the threats to the region's most important marine resources, and with it the livelihoods of upwards of 120 million people (Figure 1).



**Figure 1:** The Coral Triangle is the most diverse marine region on the planet, covering 6 million km<sup>2</sup> of ocean across six countries in the Indo-Pacific region

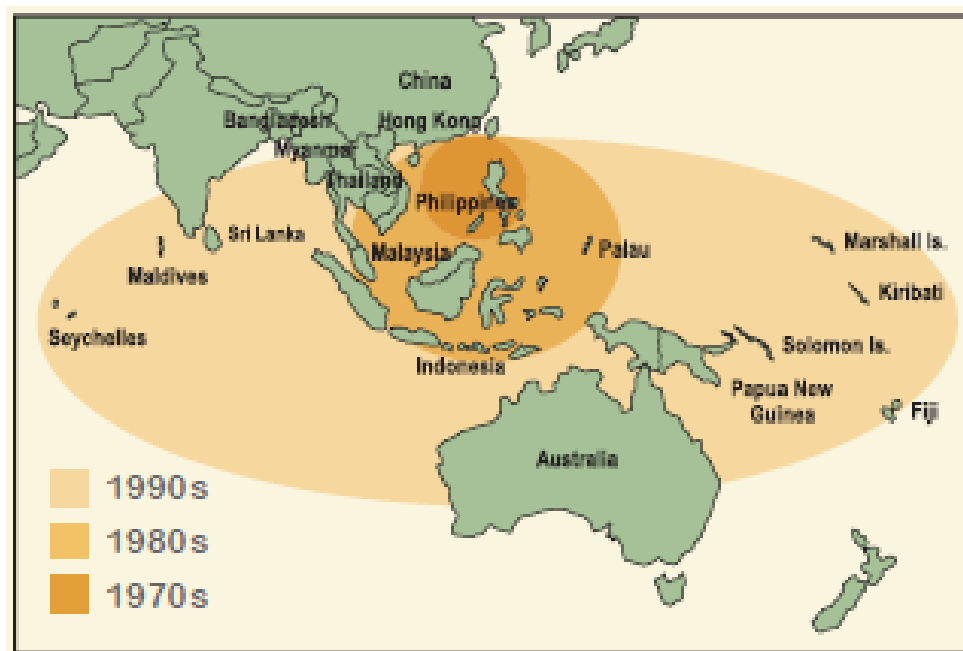
The reduction of barriers to regional trade, a persistent economic boom and growing populations in East Asia over the last 25 years has created an escalating demand for fishery resources, in particular reef fish. The demand for reef fish has triggered frenzied harvesting that is devastating reef ecosystems in the Coral Triangle at an accelerating pace. The reef's most sought-after resources are species of groupers and wrasse that comprise most of the live reef food fish trade (LRFFT). These are highly priced food items due to their superior taste and ascribed cultural value among mostly Chinese consumers. The economic boom has created a burgeoning middle-class and purchasing power that has made this luxury commodity more desirable and affordable.

Live reef food fish (LRFF) have long been traded in Hong Kong and southern China and until the 1970's most of the demand was met from nearby waters around Hong Kong. But as these reefs began showing signs of depletion, seafood traders began looking farther afield. In the intervening decades, the LRFFT has spiraled out of control expanding outward from Hong Kong in an ever widening arc (Figure 2), and at present LRFF are sourced from

as far as Australia in the east and the Seychelles in the west. The bulk particularly of the wild variety, which is preferred over the farm variety, is from Indonesia and the Philippines although Malaysia is also a significant source. The collection in these countries has gone from the most accessible to the most remote locations in less than 15 years reflecting the rate of stock depletion and reef degradation. But the reefs in the three countries also compose the core of the Coral Triangle that sustains not only an unmatched marine biodiversity but also developing economies with high incidence of poverty among its coastal communities.

Despite its geographic extent, compared with other fisheries, in terms of volumes the LRFFT is a small, even 'boutique' fishery, with regional trade estimated at around 30,000 tons annually (Sadovy et. al., 2004). This is less than 1/20<sup>th</sup> the volume of tuna exports from the Coral Triangle. Notwithstanding the small volumes, LRFF can be an extraordinarily lucrative commodity for those engaged in the trade with live product earning local fishers as much as ten times the value of that same fish sold frozen or fresh. The total value of the trade is estimated at around USD800 million annually, not much less than the value of the regions tuna exports.

Traditional factors influencing price (i.e. taste, texture, color) are being exacerbated by diminishing supplies of certain species, while at the same time demand is increasing, particularly in new and non-traditional markets such as northern China where prices can be as much as 50-100 percent higher than prices in Hong Kong and Southern China.



**Figure 2:** The expanding trade in live reef food fish from the 1970s to the 1990's. Since the late 1990's the trade has not expanded outward – in fact it has retreated from several Pacific nations – but rather it has moved systematically within borders in response to availability of fishery resources.

This relentless demand for live reef fish however is having a perverse effect, driving massive over-exploitation of target species and. Within the Coral Triangle, there has been a gradual movement of fishing activity from the west to the east or from north to south, as the trade has systematically depleted local stocks before moving into new areas. In some

places, fish stocks have been depleted to the extent that the trade is no longer economically viable.

A report published by the Asian Development Bank (ADB) in 2003<sup>1</sup> estimated potential yields of grouper species from reefs in moderate condition to be approximately 0.4 tons per km<sup>2</sup>. Using an estimate of the total reef area of the Indo-Pacific and taking into account relative intensity and geographic location of fishing effort, the average grouper yield is estimate to be closer to two tons per km<sup>2</sup>, well above what would be considered sustainable.

The Coral Triangle is widely recognized as the most important underwater wilderness on the planet but reef fish stocks are under tremendous threat from the pervasive and insidious LRFFT. Although the trade has provided communities with additional income, these benefits are unsustainable and will come at considerable long-term cost –ecologically, economically and socially.

### **3. Building a Sustainable LRFFT in the Coral Triangle**

As is often the case with extractive marine activities, sustainability means balancing marine biodiversity with poverty alleviation and economic opportunity. The revenue from catching and selling a reef fish alive is unmatched, with live product earning as much as ten times the value of that same fish sold dead. But more than that, the trade has provided an opportunity to move beyond subsistence into a more comfortable life. Household incomes of families engaged in the trade can be far greater than that earned from employment – as much as six times the provincial average in parts of the Philippines and as much as many government officials and financial sector employees in Malaysia. With few livelihood alternatives and unmatched income opportunities hard to resist, it's no surprise that the industry continues to grow as traditional lifestyles are abandoned to become part of this lucrative trade.

Naturally, this short-term view on marine resource use being embraced by many coastal communities is not without consequence. The LRFFT has become a major threat to coral reef ecosystems and marine biodiversity throughout the Coral Triangle through impacts arising from overfishing, including targeting of juveniles for grow-out<sup>2</sup> and spawning aggregations, the use of destructive fishing practices, such as cyanide and other destructive gears, Illegal, Unreported and Unregulated (IUU) fishing and under-valuing of resources. The relentless demand for live reef fish is driving massive over-exploitation of target species like the coral trout (Figure 3), and in some parts of the Coral Triangle, where stocks of this species have been locally extirpated the trade is no longer economically viable. The trade in live reef fish is leaving coastal communities vulnerable.

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<sup>1</sup> Sadovy *et al.*, (2003)

<sup>2</sup> Surveys reveal the extent of this overfishing with as much as 80 percent of all fish being taken from the reefs as juveniles, before they have had an opportunity to reproduce



**Figure 3:** The leopard coral grouper or coral trout (*Plectropomus leopardus*)

At the local level, stakeholders including government and industry must modify their mode of resource use from purely market-driven to one more closely in step with natural reproduction rates. Local efforts over the past two years on the part of the governments of Indonesia, Malaysia, the Philippines and Papua New Guinea includes: collection of socio-economic and biological data, restricting or capping fishing effort, seasonal and spatial (i.e. MPAs) closures, strengthening of enforcement systems, locating and protecting spawning aggregation sites (SPAGs), promulgating export control measures and promoting the expansion of full-cycle aquaculture<sup>3</sup>. In addition to these traditional “control” measures, market-based sustainability initiatives are being introduced. In Palawan, the current hub of the Philippines LRFFT<sup>4</sup>, some supply-side players have organized into formal groups to ease their engagement into the sustainability effort while Indonesia and Malaysia have similar plans. Other locally based programs revolve around training on practices such as better fish handling to improve quality and reduce mortality

However local efforts will only deal with sustainability issues on the supply side and on a country level. The pressure to meet growing consumer demand is relentless, and initiatives must embrace the entire supply chain. Only a comprehensive regional effort will create the synergistic result needed to affect the entire supply-demand chain, and bring together all the players in all countries involved in LRFFT in the Coral Triangle. Given the regional nature of the trade and the trans-border movement of income and commodities that

<sup>3</sup> The Palawan LRFFT Sustainable Provincial Framework Plan (2009-2013) in turn generated the ten-year LRFFT Municipal Sustainable Plan (2010-2020) for Taytay. The municipality of Taytay is the biggest source and shipper of live food fish in Palawan.

<sup>4</sup> In the Philippines the government-industry engagement produced sustainability plans at the provincial and municipal levels. The province of Palawan is designated by Philippine law as a special biodiversity zone and is also the current center of LRFFT in the Philippines being a principal source and shipment hub.



in turn create undesirable impacts on coral reef ecosystems, the workshop endeavored to outline ways to achieve LRFFT sustainability through collaboration among players within countries but also among countries.

Ambitious conservation LRFFT targets are being pursued by governments and partners in the Coral Triangle that demand a new level of engagement, advocacy and action capable of stimulating commitment to change amongst stakeholders. Despite resolute efforts over past decades to reduce impacts of the LRFFT it continues to pose major challenges for the future sustainable use of this resource. While NGOs and others maintain ongoing programs to address trade concerns, there remains a need for a more concerted effort to forge partnerships with those that matter; business, industries and governments to support action at a scale that matters. Collaborations that connect businesses and governments along the supply chain are a necessary step towards reducing overfishing and destructive fishing in the Coral Triangle. These include forging trade alliances, promoting best practices for fish caught in the wild as well as increased production of reef food fish from sustainable full-cycle mariculture, as well as helping consumers and businesses navigate their way towards sustainably sourced fish.

#### **4. Workshop Design and Participation**

This workshop is the first step in an expected series of regionally focused events over the next eighteen months supporting existing work at national levels and complementing the National Plans of Action (NPOAs) being adopted by CT6 countries. This workshop aims to bring together CT6 governments, representatives, the private sector, non-government organizations, regional agencies and institutions and practitioners to develop a roadmap to address the un-sustainability of the LRFFT.

##### **4.1. Design**

The workshop is intended to be primarily technical, focused on bringing together practitioners from the Asia-Pacific region to present the most up-to-date information on the LRFFT, including on current programs and activities. In addition to its key purpose of assembling practitioners and other key stakeholders from the private sector and government, this workshop aims to identify and prioritize key gaps in knowledge and regulation and to define a roadmap and strategies for addressing this unsustainable trade.

The workshop started with a key proposition; “What might a Sustainable Live Reef Food Fish Look Like” and “Why do we want that”, and looks to examine the specifics of how a sustainable LRFFT would be achieved and this how success, or otherwise, could be measured. This includes a series of presentations designed to:

- Provide a snapshot of current status and trends for the LRFFT and share information on past and current efforts at national and regional scales to address sustainability;
- Identify lessons learned and factors contributing to successes and failures of past and current LRFT programs and explore what these tell us about how to more sustainably manage the LRFFT;
- Identify key sustainability indicators from biological, managerial and industry perspectives, including information gaps to inform those indicators and support a sustainability proposition

- Help explore collaborative opportunities at national and regional scales to strengthen partnerships between multi-stakeholders along the supply chain, including private sector partnerships and policy initiatives;
- Inform as to the realities of achieving a functional LRFFT including constraints and opportunities posed by multi-stakeholder participation involving industry and multi-lateral exigencies associated with footprint economies such as Hong Kong and China

The workshop had 15 plenary presentations, three panel discussions and two breakout groups and five plenary sessions (Appendix 5). The assessment of the current status and trends including the opportunities to promote LRFFT sustainability in regional and sub-regional efforts were made through the plenary presentations and panel discussions. The presentations were on the biological (2) economic (1), social (1), technological (1), regulatory (3) and business (2) aspects. In addition, there were two presentations on best practices and three on opportunities in regional and sub-regional groupings. One panel discussion was on LRFFT sustainability as viewed by the industry players another as viewed by the regulators. Another panel discussed the best practices.

The two breakout groups and plenary sessions produced the main workshop outputs. These were the sustainability indicators, prioritized actions and functionality matrix. The first two outputs were done in breakout groups and the results were consolidated into one. The actions composing the consolidated output of the second breakout grouping was prioritized in a plenary session. The prioritized actions were later assessed in a plenary session in terms of ecological, social and economic functionality.

## **4.2. Participation**

The workshop had 47 participants from at least eight countries (Table 1). The Philippines and the People's Republic of China (PRC) including Hong Kong had the largest representation at 26 and 21 percent respectively. The sectors represented were the industry, government, environmental NGO, research organizations and international development agencies. Around 26 percent of the participants were women (see Appendix 2 for Participant List).

**Table 1:** Participants of the Regional LRFFT Workshop: Hong Kong 10-12 November 2009

<b>Countries</b>	<b>Industry</b>	<b>Government</b>	<b>NGO</b>	<b>Research Organization</b>	<b>Development Agencies</b>	<b>Total</b>	<b>%</b>
Australia	1		1	1		3	6%
Indonesia	1	4	3			8	17%
Malaysia		1	1			2	4%
Papua New Guinea		1				1	2%
PRC and Hong Kong	3	1	5	1		10	21%
Philippines	4	3	2	3		12	26%
Singapore			1			1	2%
United States		3	1			4	9%
Others	1		3	1	1	6	13%
<b>Total</b>	<b>10</b>	<b>13</b>	<b>17</b>	<b>6</b>	<b>1</b>	<b>47</b>	
<b>Percent</b>	<b>21%</b>	<b>28%</b>	<b>36%</b>	<b>13%</b>	<b>2%</b>		<b>100%</b>

## 5. Workshop Content

The presentations and panel discussions revealed the current status and trends of the various aspects of LRFFT in the region where the Coral Triangle serves as the commodity source with Hong Kong as the central trading hub. The pertinent points from the various presentations across the three (3) days of the workshop have been consolidated into four components, i) Biological status, ii) Industry status, iii) Management status and iv ) Future trends. These points have been summarized below.

### 5.1. Biological Status

1. Current knowledge on live reef fish food (LRFF) is limited to fish with nothing is known of invertebrates shipped live within the region;
2. There are gaps in biological data needed to improve management including on growth and recruitment, mortality in capture and culture, catch characteristics (e.g., species, body, size, volume) including catch per unit effort (CPUE) and basic biology such as spawning season and sexual maturation;
3. Five of the 12 LRFF species are threatened; the giant grouper, humpback grouper, humphead wrasse, Hong Kong grouper and squaretail grouper. These LRFF cannot withstand continuous exploitation;
4. Actual “exploitation” rates are unknown due to a combination of poor recording by source countries and that most LRFF shipped to Hong Kong by sea are unrecorded.
5. Although hatchery production for six LRFF species is increasing, significant volume still comes from the wild either directly or as seed and/or juveniles for grow-out;<sup>5</sup>
6. Industry expansion to source wild-caught fish, both juveniles to adult has been rapid. Expansion outward from Hong Kong in the 1970’s (see Figure 2) and currently covers large part of the Indo-Pacific. Although data is limited, the assumption is that the extraction rates have outstripped the natural reproductive capacity of fished areas;

<sup>5</sup> The species with significant hatchery production are as follows: giant grouper, humpback grouper, dusky-tail grouper, brown marbled grouper, Malabar grouper and orange-spotted grouper

7. The size of wild-sourced fish and the yield from coral reefs long used as LRFF sources is recorded to have shrunk compared to years ago in parts of the Philippines pointing to depletion due to over-exploitation;<sup>6</sup>
8. Based on the Australian experience, commercial fishing for Coral trout can be managed so as to sustain stocks. Evidence of “sustainability” including stabilized catch rates since 2004, increasing CPUE and increasing average fish sizes across the fishery;
9. The prospect of sustainable harvesting of the suite of target LRFFT species varies with the Coral trout (ranking highest by virtue of it being fast growing – hence a shorter time requirement to reach sexual maturity, prolific, having a lower vulnerability to overfishing – including during spawning periods and robust enough to withstand the rigors of handling, husbandry and shipping.

## **5.2. Status of the Industry**

1. Estimates of the retail volume of LRFF traded regionally vary from 18,000 to 50,000 metric tons (MT) annually with an estimated “retail” value in excess of US\$800 million.<sup>7</sup>
2. According to the Agriculture, Fisheries and Conservation Department (AFCD) presentation, 2008 imports of LRFF in Hong Kong were stated as being 8,467 MT valued at US\$0.13 Billion US Dollars and had been exhibiting an upward trend since 2003.
3. According to data collated by WWF, Census and Statistics Department (CSD), 2008 imports totaled 11,437 MT, which included an estimated 3,058 MT imported via fishing vessels. The veracity of these fishing vessel estimates and how they are calculated is not well known. Using these same data, WWF estimates the “retail” value of imports to be considerably higher at more than US\$0.5 Billion. (NB. Retail values are considered to be a more appropriate measure of industry value) (Appendix 3).
4. In contrast to upward trends promoted by AFCD at this meeting, data collated by WWF demonstrates an upward trend in imports from 1999 to 2006, but a subsequent decline from 2007 through to 2009 (Appendix 3).
5. Air transport is the main mode (60-70%) used to land fish in Hong Kong followed by fishing vessels (20-30%), while transport ships and land vehicles comprise the remainder (5-10%). There is no mandatory reporting requirements for LRFF entering Hong Kong by sea, hence recorded imports are likely grossly underestimated.
6. The LRFFT supply-demand chain is complex with up to ten segments: fisher, first and second buyer, grow-out stopover, exporter, importer, wholesaler, distributor, retailer and consumer. There is substantial vertical integration and a system of patronage between fishers, buyers and exporters in source countries and importers in Hong Kong and mainland China still prevails.
7. As a livelihood source, the LRFFT provides income to undetermined number of households in both source and demand economies.

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<sup>6</sup> From surveys” conducted by WWF Philippines in the municipalities of Taytay, Cuyo, Araceli, Roxas, Coron, Culion, San Vicente and Quezon in Philippines Palawan province .

<sup>7</sup> Estimates provided by the Hong Kong Census and Statistics Department (HKCSD) are around 13 – 14,000 tons annually but these are mostly LRFF arriving by air and do not record a majority of LRFF shipped by sea or those that enter mainland China directly or other regional destinations such as Singapore and Malaysia

8. Unlike other industries which are composed of corporate players, the LRFFT is dominated by small family-run enterprises making the use of certification programs challenging and difficult to manage as a tool to ensure regulatory compliance and to demonstrate commitment to environmental standards of good practice.
9. Hong Kong has over 100 hundred seafood importers, wholesalers and distributors, many of whom do not trade in LRRFT. The major LRFF traders are relatively small in number and have considerable market influence. In contrast the total number of players (fishers, buyers, traders, exporters) in source countries in Southeast Asia is unknown.
10. This market structure calls for an approach whereby bottlenecks and intervention points in the supply chain are identified.
11. Based on official data, Indonesia, the Philippines and Malaysia account for almost two thirds (65%) of the total volume of LRFF imports into Hong Kong. As at 2008, other major source countries are Australia, Thailand and Taiwan.<sup>8</sup>
12. According to the AFCD, Macao receives 59 percent of the LRFF re-exported from Hong Kong while Taiwan and Mainland China account for 25 and 16 percent respectively. Anecdotal reports on the volume of LRFF entering mainland China through 'informal' channels suggest these official data are incongruous inconsistent with. There is LRFF enter tax-free into Hong Kong and can be re-exported to the mainland with a lower tariff.
13. LRFFT profitability can increase with improvements in logistical efficiencies, reduction of mortalities and catch controls as evidenced by the Australian experience.
14. Full cycle mariculture technology is available but only for selected LRFF species. Economic viability varies widely by species based on survival rates of farm-breed fish and market prices, indicating the level of maturity of the technology.
15. Industry players in source countries operate under different business models, ranging from "independent" entities that buy and sell fish in their own right using their own funds to those who act as brokers and receive a fee for "handling" fish. These different business models can affect the attitudes toward industry stewardship with the former more likely to be more motivated by efficiency, low mortality and long-term viability, including acknowledging the need for harvest strategies, and the latter being a volume-based businesses with shorter time horizons.
16. Related to these different business models, the industry players in the source countries have varying view on the degree of severity of resource depletion requiring a more inclusive research processes to generate more robust data and a common view.

### **5.3. Status of Management**

1. The current management of LRFFT in the source and recipient countries does not guarantee resource sustainability, perhaps with the exception of Australia.
2. There are a range of regulatory tools available to improve the management of the LRFFT including; restrictions on numbers of licenses and fishing effort, limits on catch volumes and composition, controls on boat numbers and sizes and the use of certain

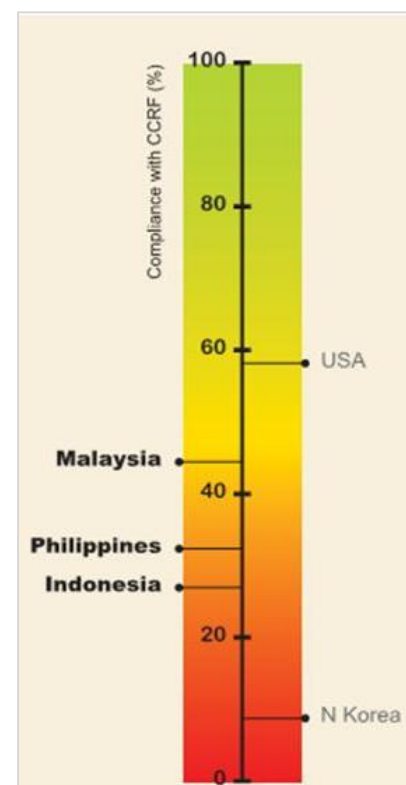
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<sup>8</sup> According to HKCSD data, some 21 countries in the Indo-Pacific region export LRFF into Hong Kong



fishing gears, controls on fish sizes (i.e. minimum and maximum size at catch), controlling access to fishing grounds through spatial and seasonal closures; protection of spawning aggregation sites and designation of other harvest refugia and promulgating export control measures.

3. The source countries have many of these policies in place aimed at making the LRFFT more sustainable including imposition of seasonal and temporal closures, controls on catch volumes (NB Australia only), controls on fishing gears, number of fishers and type of catch.
4. Enforcement of these policies and regulations is less than desirable due to a combination of limited capability, weak and poorly resourced government agencies and institutions, especially where there is decentralized management, lack of coordination between agencies and institutions, expansive, and in many cases remote, management areas, economic instability, corruption and pressures from large and poor constituencies.
5. The main LRFF source countries, Indonesia, the Philippines and Malaysia all rank poorly in terms management performance against the FAO Code of Responsible Fisheries. Although this assessment is based on performance across all fisheries, the issues are the same for the LRFFT.
6. Promulgating LRFFT regulations can be a challenge but existing international agreements like the Convention on International Trade in Endangered Species (CITES) can be used to strengthen existing regulations.
7. The LRFFT is one component of reef fisheries management with numerous other ecosystem and by-catch impacts to be considered.
8. While countries represented at this meeting operate under different conditions and are faced with very different challenges, the Australian LRFF fishery has shown that adaptive management can enhance fishery sustainability as measured by catch rates, CPUE and average fish sizes and industry profitability.
9. There is a high level of cynicism among fishers about fisheries governance with decentralized governance seen as leading to increased conflicts of interest and corruption and decreased participation of resource users in decision-making. The political economy of fisheries governance can be a significant barrier to reform where fishing is closely linked to poverty and hence the government's role is seen as supporting poorer fishers.



Source: From Pitcher et al., 2009

## 5.4. Future Trends

1. The demand and price of LRFF will likely increase as the population and income of the receiving countries, especially mainland China grows. The evidence in mainland China is overwhelming, with wholesale and retail prices for high-value species such as Coral trout and Humphead Wrasse are as much as 50 percent higher than in Hong Kong.
2. Wild stock harvested directly, including juveniles and undersize fish taken for grow out will continue to contribute significantly to the total volume of LRFF.
3. Anecdotal evidences suggest average fish sizes of targeted LRFF species have declined over the years in areas the trade has been operating. In some cases, juveniles and undersize fish comprise more than 60 percent to 70 percent of all harvested fish which is compromising the future productivity of the stocks.
4. Rising demand and declining wild stocks implies that aquaculture will benefit more in the long run as the primary source of fish for this trade. While capture fisheries will likely decline in terms of volumes traded, this will be offset to some extent by increases in value.
5. Aquaculture will not solve the issue of resource overexploitation and other regulatory and livelihood measures are necessary to compliment it if sustainability remains the main goal. For example, stability in production, quality of product and adequate, but not over-supply is necessary for aquaculture industry to meet market expectations.
6. Aquaculture as an industry has more flexibility and opportunity for regulation both in terms of its rate of growth and in accordance with environmental best-practice; this is more challenging where small-scale producers in remote locations dominate. Under these conditions aquaculture can dislocate the livelihood of small-scale actors in source countries.
7. Improved fisheries management is needed to benefit capture fisheries, particularly at the nexus between wild-caught and aquaculture production.
8. Due to government limitations in some source countries, LRFFT actors (NGO, Fishers, Traders and Academe) have come together as part of efforts to improve sustainability of the LRFFT resulting collective agreements and actions in Malaysia and the Philippines.
9. Regional and sub-regional organizations are providing avenues to manage LRFFT across countries (e.g., joint patrols, information exchange, multi-country research and collective planning), deepen industry engagement and operate collaborations for greater synergies and coherence of effort and magnification of impact.<sup>9</sup>
10. The efforts of NGOs and regional and sub-regional organizations has led to increasing recognition among all supply chain actors in the source and receiving countries, including in the industry, of the need to improve the management of LRFFT for greater economic and ecological sustainability or at least functionality.

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<sup>9</sup> Regional and sub-regional groupings include Asia-Pacific Economic Cooperation (APEC), Brunei, Indonesia, Malaysia and the Philippines East Asia Growth Area (BIMP-EAGA) and Coral Triangle Initiative (CTI).

11. The LRFFT is a niche market and without the 'clout' of a large institutional buyer such as Wal-Mart, it is unlikely that any certification program can emulate the success of the MSC or FSC and succeed at this time. Any LRFFT 'certification' program will need to be industry or even consumer led, aimed at the end consumer in the restaurant and be of low cost to the industry players.
12. Recognition by demand-side economies that unless subject to strict regulation and enforcement, the Humphead wrasse may become threatened with extinction. Demand-side economies acknowledge the need for regulation of imports into Hong Kong by sea, export and re-export via a licensing system.

## **5.5. Certification and Voluntary Codes of Conduct**

One focus within recent LRFFT work has been on promoting the development and adoption of "measurable" standards of best-practice through a multi-stakeholder participative process.

A previous project, supported by the APEC Fisheries Working Group, "Developing Industry Standards for the Live Reef Food Fish Trade" was completed in 2005 and successfully produced the International Standard for the LRFFT (*International Standard*) through a multi-stakeholder, consultative process. Other outputs included a dedicated website and a comprehensive CD-toolkit providing the necessary information to guide the "implementation" of the Standard. This project generated an unexpected interest in the acceptance of the possibility of using an International Standard as a 'soft regulation' tool within the trade and as a basis for promoting a more responsible trade. The relevance of this work has not diminished since the completion of this project and an opportunity to fully test the Standard 'through to a prototype certification scheme' in a few select locations in the Asia-Pacific has been identified to be of great interest and value. Unlike other projects, the assumption has not been made that certification is the final solution for sustainable harvesting of LRF.

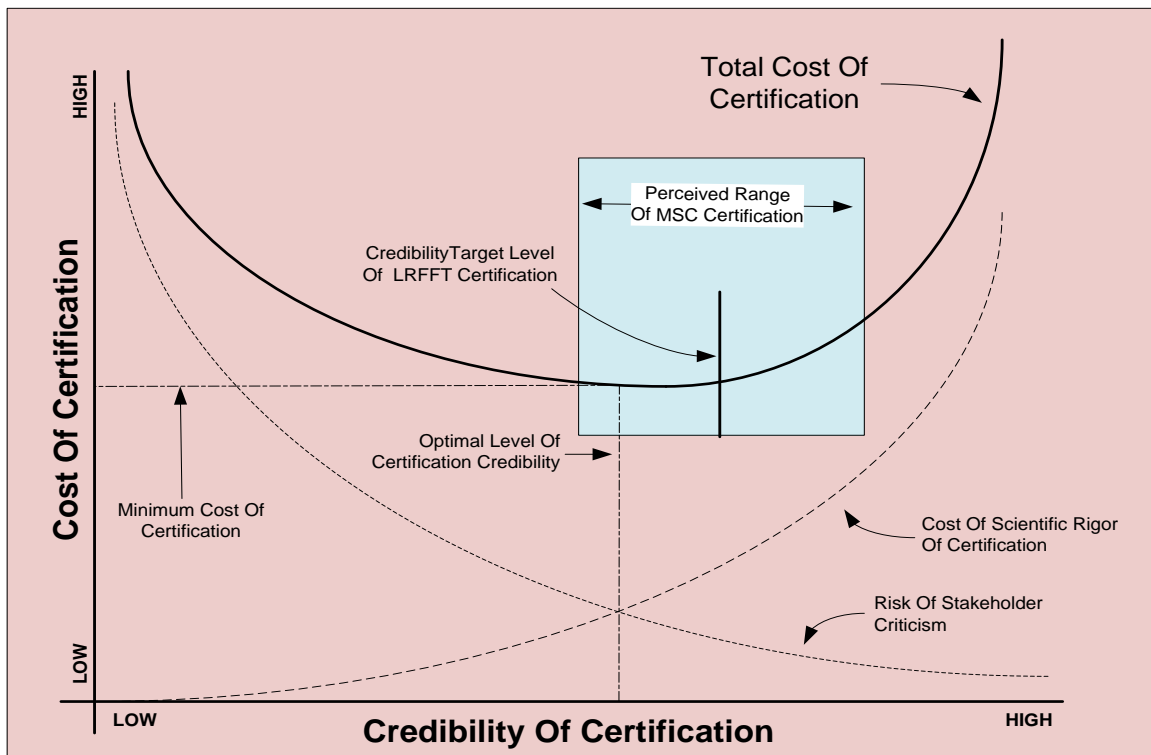
While no assumptions are made that certification is the final solution for sustainable harvesting of LRF, strengthening existing LRFFT 'voluntary' standards (*the International Standard*) through establishing a certification scheme linked to international certification programs such as ISO9001 or ISO14001 have been reviewed. The results of this review were presented at this workshop.

Rather than 'formal certification', an approach that may garner more success would be the application of a voluntarily Code of Conduct. Such Code of Conduct programs have been successful in other sectors (e.g. Clothing). Related to this is recognition that "non-sustainability" issues such as food safety may represent a better 'hook' to achieve early stakeholder buy-in. A prerequisite for success in any voluntary or third-party accreditation program is cost, all the more important in the small-scale fisheries that characterize the LRFFT.

It was proposed that were a certification program considered for the LRFFT it could be designed so that certification of members along the chain of custody for the LRFFT be to ISO9001, with the existing International LRFFT Standard being used as the criteria by which performance is measured to that standard. This approach of attaching any LRFFT Standard to ISO Certification would contribute to keeping costs down. Moreover, linking an LRFFT

Standard to ISO9001 or ISO14001 certification leverages the large number of certification bodies that exist world-wide that implement this, which could also reduce certification costs.

The debate around costs of certification needs to be framed in the context of credibility. In theory there will be a point at which credibility versus costs is optimized (Figure 4). To the left of this point credibility of certification will diminish and the risk of stakeholder criticism will be amplified. Beyond this point certification costs, including the cost of scientific rigor associated with achieving certification, may be comparatively more than the additional credibility (i.e. full third-party accreditation) and lesser criticism associated with that additional cost.



**Figure 4:** Certification Cost vs. Credibility

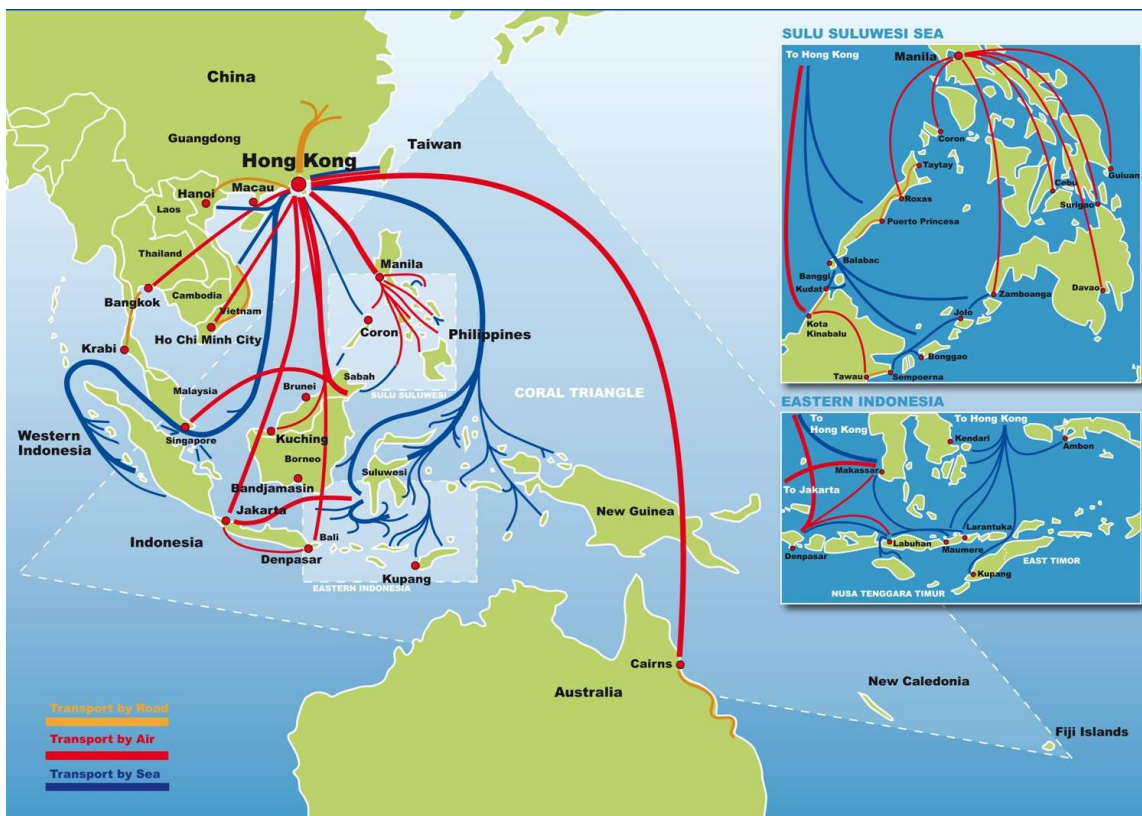
In terms of moving forward, some observations and suggestions are:

- The existing International Live Reef Food Fish Standard makes an excellent foundation for a Code of Conduct document for the LRFFT, and should be re-written as a Code of Conduct for the LRFFT
- An LRFFT Code of Conduct Program may make a good foundation for a future independent third party certification program should the LRFFT require and support this
- Forming of buyers groups at all parts of the supply chain that can support a voluntary adoption of a LRFFT Code of Conduct
- Look at initially testing an LRFFT Code of Conduct in one or more countries within and outside (i.e. PRC, Hong Kong ) of the Coral Triangle, as a trial or pilot program

## 6. Sustainability and Functionality in the Live Reef Food Fish Trade

Most definitions of sustainability require that a system is; i) Healthy, ii) Integrated (natural, social and economic) and iii) Generational. Strict adherence to sustainability essentially implies that a sustainable system is one that will allow that “You can keep doing what you are now doing”.

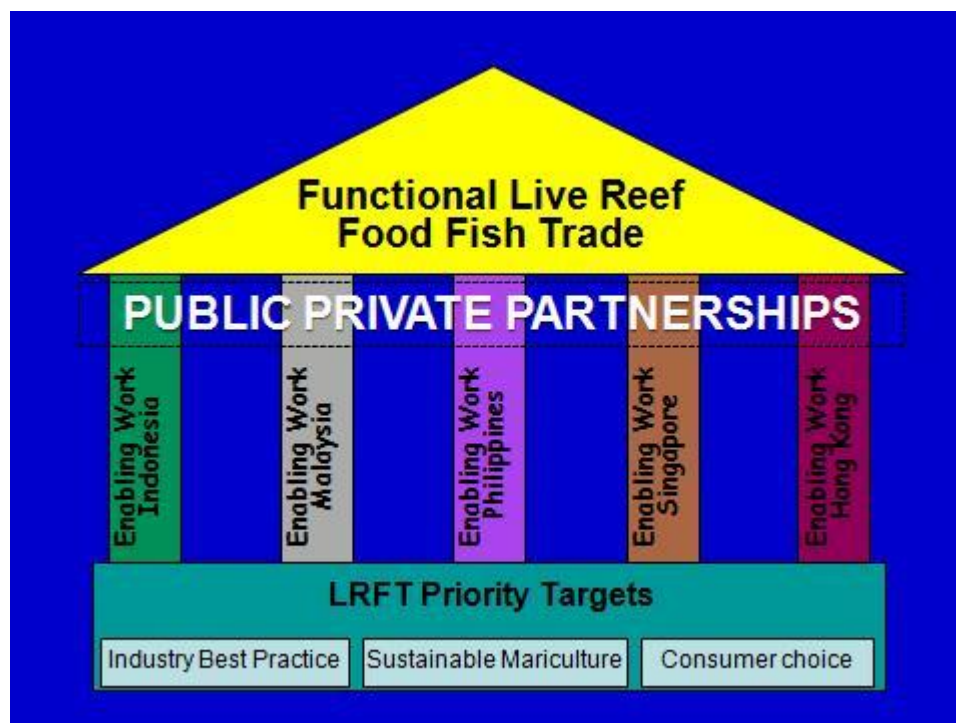
But given that sustainability definitions can become complex could it be more practicable, feasible, realistic or viable to view sustainability fundamentally as a “*Functioning system*”. If functionality is what we are talking about, what could or would a functioning LRFT look like in terms of i) natural systems (ecosystems); ii) social and economic systems; iii) governance and policy systems and iv) industrial / trading systems. Commodification of marine resources such as fish will create a chain of custody – or a supply chain – for that commodity. In the case of LRFFT as an export commodity, the supply chain will be international spanning across multiple levels of governance (Figure 5).



**Figure 5:** The regional trade in Live Reef Food Fish with lines showing transport routes by Road (Yellow), Air (Red) and Sea (Blue) from source countries in the Coral Triangle to the main regional demand centers in Hong Kong and mainland China.



Viewing functionality through the lens of the LRFFT, this implies that consideration will need to be given to the; i) Local and/or provincial level, ii) National level, or iii) Regional or trans-boundary level (including demand side economies). The last of these, the regional or trans-boundary level, is central to the issue of a functional LRFFT and achieving it will require; Governments from source and demand economies committed to action, including collective action, recognition that supply chain actors operate across national boundaries, and a tapping in to regional and global consumer attitudes (Figure 6).



**Figure 6:** Achieving a functional LRFFT requires recognizing the regional nature of the trade requires collective national action involving stakeholders from the public (government) and private sector across the chain-of-custody of LRFF.

But a question for each of these actors and countries involved in the LRFFT is “*What is the Incentive for achieving a functioning LRFFT?*” Are the incentives or pressure points about; price?, enforcement and regulation?, demand restrictions or consumer pressure?, or is the single biggest incentive the threat of the fishery collapse?

### 6.1. Current Status of Functionality in Selected Coral Triangle Countries

The participants grouped themselves by country (Indonesia, Malaysia, Papua New Guinea and PRC and Hong Kong) to agree on the indicators of non-functional as well as a functional LRFFT system. The scientists among the participants formed one group. The groups also assessed the non-functionality of the LRFFT practices prevailing in their country. The six groups agreed on the following non-functionality indicators to be discussed in break-out:

- Overexploitation;
- conflicting national interests;
- unhappy relationship among players;
- risk in quality and supply among buyers;
- no regulations or management measures; and
- weak enforcement.

There was a general acceptance that the LRFF is overexploited except in Papua New Guinea where it is still considered abundant (Table 2). But in the Philippines the industry group disputed the view of the government, NGO and scientists noting that there is no fish size reduction overtime and farther fishing ground does not mean overexploitation.

The situation of overexploitation brings to the fore the conflict between long-term food security and short-term gains in Indonesia. Even in Papua New Guinea where LRFF stock is still high, the same conflict exists in addition to the conflict between LRFF and tourism. But no conflict was felt in Malaysia and the Philippines. The conflict pits the fishers among themselves and against the buyers in Indonesia and the Papua New Guinea. The local communities and tourism industry has opposed the positions of the LRFF operators and traders. In the Philippines, all stakeholders are up against unregulated resource users.

The current situation raised risks among buyers. High catch and transport mortality is reported in Malaysia, Papua New Guinea and the Philippines while Indonesia contends with the absence of any quality standards. To the scientists the preference of wild caught fish over farmed ones poses a risk to supply. In spite of these risks, Indonesia has no LRFF specific policies while the policies in the Philippines are inconsistent with each other. In Papua New Guinea the policies are contained in a single management plan. In Hong Kong which is a receiving country, the need to change internal regulations and install trans-boundary regulations is noted.

Exacerbating the policy shortcomings in Indonesia, Malaysia, Philippines and even Hong Kong are weaknesses in enforcement. This is largely underpinned by limited resources and in the case of the Philippines, use of public office for personal interests. The scientist observed poor compliance to regulations across the region.

**Table 2:** Indicators of Non-Functioning LRFFT System and Country Status: November 2009**(a) Over-exploitation of target stocks**

Country / Group	Key Comments
Indonesia	Low yields from over-exploitation of stocks has diminished the LRFFT in western Indonesia and slowed it down in eastern Indonesia. Overall stocks have decreased across Indonesia because the higher price for LRFF over more traditional product forms (fresh, frozen) has prompted greater fishing effort. The LRFFT is thriving in some places that are using good fishing and handling practices and where there is high conservation awareness evident from actors in the supply chain.
Malaysia	In Malaysia, a study completed in April 2009 (reference) established overfishing was occurring in its waters, as did a previous paper from Stobutzki <i>et al.</i> (2006) which estimated demersal stocks had declined to 4 – 20% of original estimates
Philippines	In the Philippines, scientists and government have documented declines in average fish size and that fishers are travelling farther to reach productive fishing ground. Industry reasoned that it is the search for better-quality fish driving fishers farther from home and not stock depletion but evidence from northern Palawan (i.e. Coron) where the industry has closed down contradicts this assessment
PNG	Overexploitation is not an issue in Papua New Guinea due to large, and currently, unexploited or under-exploited stock
Scientists	A general observation by the scientists group was that licensing systems are not working to curb excessive effort and hence overexploitation.

**(b) Conflicting national interests**

Country / Group	Key Comments
Indonesia	Indonesia has conflict between long-term food security and short-term profits from continuous harvesting
Malaysia	No conflict is noted in Malaysia
Philippines	No conflict is noted in the Philippines
PNG	In Papua New Guinea, there is a conflict between LRFFT on one hand and food security and tourism development on the other
Scientists	The scientists observed that poverty reduction is often used as argument against imposing a more sustainable resource harvesting regime

**(c) Risk in quality and supply among buyers**

Country / Group	Key Comments
Indonesia	<ul style="list-style-type: none"> <li>Indonesia currently has no standards on quality assurance</li> </ul>
Malaysia	<ul style="list-style-type: none"> <li>Malaysia reports that high catch and transport mortality afflicts the LRFFT in Sabah. Unstable fish prices and the control of few over packaging materials and freight facilities is also considered a risk to the viability of the LRFFT in Sabah, Malaysia</li> </ul>
Philippines	<ul style="list-style-type: none"> <li>The Philippines also reports high catch and transport mortality</li> </ul>
PNG	<ul style="list-style-type: none"> <li>The use of sea transport in Papua New Guinea poses more risk of fish mortality than does air transport, and on those occasions when live fish have been exported from PNG, it has generally been by boat</li> </ul>
Scientists	<ul style="list-style-type: none"> <li>Among the scientist, the relatively low interest on farmed fish poses risk in supply</li> </ul>

**(d) Unhappy relationship among players**

Country / Group	Key Comments
Indonesia	In Indonesia, there is conflict among fishers over fishing grounds and between the fishers and buyers
Malaysia	Malaysia is providing livelihood support to the poorest of fishermen to avoid the issue
Philippines	In the Philippines, all LRFFT stakeholders are against the unregulated resource users
PNG	The same conflict is noted in Papua New Guinea. It also exists between LRFFT operators and the government on one hand and the local communities and diving operators on the other
Scientists	

**(e) No regulations or management measures**

Country / Group	Key Comments
Indonesia	<ul style="list-style-type: none"><li>Decentralization has brought confusion that has weakened governance and derailed the development of management plans and their enforcement. There are no regulations in place in Indonesia that could be applied to the LRFFT or to govern the behavior of industry players and best practices are not well documented.</li></ul>
Malaysia	<ul style="list-style-type: none"><li>There are no fisheries specific management plans including for LRFF in Malaysia</li></ul>
Philippines	<ul style="list-style-type: none"><li>Fisheries governance mechanisms exist in the Philippines that provide for regulation and management plans to be developed at national and provincial levels. The Philippines contends with inconsistent policies, insufficient data for decision-making and a lack of capacity that hampers enforcement</li></ul>
PNG	<ul style="list-style-type: none"><li>Papua New Guinea has a specific LRFFT Management Plan developed under its National Fisheries Act that incorporates a code of conduct for LRFFT players</li></ul>
Hong Kong	<ul style="list-style-type: none"><li>Hong Kong noted the <u>importance</u> of their regulations categorizing LRFF as food and the need for cross-boundary regulatory frameworks coordinating national jurisdictions on measures and indicators such as minimum fish sizes</li></ul>

**(f) Weak Enforcement**

Country / Group	Key Comments
Indonesia	<ul style="list-style-type: none"><li>The IUU trade in LRFF is reportedly on-going in Indonesia, principally in the more remote Eastern Indonesia where decentralization has weakened enforcement and abetted a high incidence of corruption</li></ul>
Malaysia	<ul style="list-style-type: none"><li>The expanse of its coastal area and current budget limits enforcement efforts and this is exacerbated by the well-established trade between the Philippines and Malaysia.</li></ul>
Philippines	<ul style="list-style-type: none"><li>Papua New Guinea has regulations requiring video monitoring systems and compulsory observers be in place on LRFFT boats, although these</li></ul>
PNG	<ul style="list-style-type: none"><li>The Philippines recognize the need for more effective policy implementation and to deal with low level of resource rent and engagement of politicians in LRFFT</li></ul>
Hong Kong	<ul style="list-style-type: none"><li>In Hong Kong, there is a need to recognize undocumented and sometimes illegal LRFF shipment to support efforts of source countries in controlling IUU exports</li></ul>
Scientists	<ul style="list-style-type: none"><li>The scientists observed that compliance with regulations on practices such as cyanide use and minimum size limits is poor across all country fisheries</li></ul>

## 6.2. Functionality Indicators, Actions and Ranking

Based on their assessment of the status of LRFFT in terms of non-functionality, the country groups and the scientists identified 16 indicators of a functional LRFFT system (Table 3). One is on biology, four on industry, eight on management and two cut across all aspects. In terms specific indicators of functionality, the need for national, regional and industry collaboration was identified by the most number of groups (5), with only the Science group not acknowledging it as functionality indicator. The next most important indicators, as measured by number of groups that identified that indicator, were marine protected area (MPAs) for SPAGS and application of full-cycle technology and responsible aquaculture, both identified by four groups. Other frequently identified indicators were improved fish handling, export control and links with livelihoods.

**Table 3:** Ideal LRFFT Functionality Indicators: November 2009

Indicators	Country					
	ID	MY	PNG	PH	PRC/H K	L & S
<b>Biology</b>						
MPA for SPAGS	X	X	X	X		
<b>Industry</b>						
Full-cycle technology and responsible Aquaculture	X	X		X		X
Improved fish handling		X	X	X		
Quality insurance						X
Higher prices as leverage for responsibility						X
Product diversification						X
<b>Management</b>						
Export control	X	X		X		
Permitting system			X	X		
Fishing effort control		X				X
Harmonized Standards	X			X		
Robust enforcement		X		X		
Organized players	X			X		
National, regional and industry Collaboration	X	X	X	X	X	
Livelihood links	X	X				X
<b>Cross-cutting</b>						
Resource inventory and monitoring			X	X		
High level of awareness			X	X		

*Country Legend. ID = Indonesia, MY = Malaysia, PNG = Papua New Guinea, PH = Philippines, PRC/HK = Peoples Republic of China/Hong Kong, L & S = Scientists.*

Working by sector in break-out groups (industry, government, NGO and science), the participants formulated a list of actions needed to meet these functionality indicators.



In a subsequent plenary session, the rudimentary results were distilled into twelve priority actions based on commonalities among the breakout groups and discussion among participants. These are listed below (Table 4). Again in plenary, each participant was given 12 votes each to use in selecting their priority actions. The 12 votes could be distributed among a number of actions or allocated wholly to a single action that the participant feel should be the priority. The 39 participants cast a total of 468 votes in selecting and ranking the priority actions.

From this ranking process; matching harvesting to reproductive capacity was chosen as the top priority action. This was followed by; the promotion of full cycle responsible aquaculture and enforcement against illegal unreported and unregulated (IUU) fishing and use of spatial and temporal closures to protect spawning stocks. It should be noted that multi-stakeholder initiatives such as alliances and bi-and multi-lateral collaborations also ranked highly. These prioritized actions composed the strategic roadmap of the multi-stakeholder and multi-country effort to attain greater LRFFT sustainability.

**Table 4:** Priority Actions to Improve LRFFT Sustainability and Ranking: November 2009

<b>Actions</b>	<b>Score</b>	<b>Ranking</b>
Match exploitation to reproductive capacity	72	1
Promote full cycle responsible mariculture production	67	2
Enforce the laws against IUU fishing	52	3
Protect spawning stocks through spatial and temporal measures (i.e. area and seasonal closures)	46	4
Build and manage multi-stakeholder (government, NGOs and private sector) alliances	46	5
Conduct objective oriented data collection on ecology, production, marketing and socio economics	42	6
Organize and manage government to government collaboration	37	7
Set minimum size for capture	28	8
Conduct government facilitation with NGOs, private sector and research institutions	25	9
Develop market linkages	24	10
Integrate and consolidate best practices (BMPs) into supply chain	17	11
Mitigate consequences of displacement	12	12
<b>Total Votes</b>	<b>468</b>	

The ranking revealed the most widely felt concern among the participants and the order of their preference. But it was noted during the plenary session after the ranking exercise that all actions are needed and are in fact inter-dependent to make the LRFFT more functional. For instance, the matching of harvesting to reproductive capacity can only be done if SPAGS are protected by spatial and temporal measures and integration and through the consolidation of Better Management Practices (BMPs) along the supply chain.

## 7. Conclusion – Next Steps to Socialize Workshop Results

The priority actions will guide the organizations, whose representatives attended the workshop, in their activities aimed at improving the LRFFT functionality. The immediate actions that they committed include bringing the workshop result to various multi-lateral forums where these could be pursued and supported (Table 5). These forums include the CTI Secretariat, Sulu-Sulawesi Marine Ecoregion (SSME) Tri-national Committee, BIMP-EAGA Facilitation Center and Natural Resource Cluster Group, Asian Development Bank, International Coral Reef Initiative (ICRI) and Association of Southeast Asian Nation (ASEAN) Secretariat, and the Fisheries Commission for Food and Agriculture Organization (FAO) member countries. The results will also be brought to national level forums including national Technical Working Groups.

**Table 5:** Proposed Actions to Build on the Result of the Workshop and Carry It to the Next Level

Proposed Follow-Up Activities	Lead Organization
1. Bring the workshop summary to CTI Secretariat, SSME Tri-national Committee, BIMP-EAGA, Academe, National Technical Working Groups, ASEAN, other bodies	Various Organizations
2. Bring the workshop summary to Asia-Pacific Fisheries Commission (APFIC) for FAO member countries	APFIC (FAO) Bangkok Office
3. Submit workshop result to ICRI meetings:	US State Department
4. Further develop priorities for inclusion into existing or proposed workplans and international, regional or national fora (i.e. USCTI Regional Exchange workshop)	WWF Coral Triangle Program USCTI, CTSP
5. Incorporate outcomes and priorities from this workshop into National Plans of Action of major CTI source countries, utilizing existing programs (e.g. WWF CTNI). into Conduct of Manila LRFFT Meeting in January;	WWF Coral Triangle Program
6. Use the workshop results to shape agenda of upcoming LRFFT workshop “Market-based improvements in live reef food fish trade “ supported by APEC Fisheries Working Group and the WWF Coral Triangle Program	WWF Coral Triangle Program
7. Initiate additional research and reporting on markets and trade for LRFF including on re-exports from Hong Kong, price trends in Hong Kong and China and the trade in CITES listed species	WWF Coral Triangle Program, WWF Hong Kong, WWF China, Various Organizations
8. Initiate the formation of Indonesian, Philippine and Malaysia industry alliance’s and piloting of BMP’s with “alliance”	MMAF Indonesia
9. Initiate Indonesia-Hong Kong government LRFFT interaction	MMAF Indonesia and Hong Kong AFCD
10. Conduct recovery effort of Humphead Wrasse in Malaysia	DOF Sabah
11. Launch Singapore consumer campaign and traders involvement	WWF Singapore
12. Proceed with implementation of LRFFT Sustainability Plan for Taytay, Palawan, recruit more traders into Palawan Fish Traders Association (PALIFTA), conduct sustainability seminars intensify of multi-stakeholders’ engagement	PCSD, BFAR, Philippines, WWF Philippines, (PALIFTA)
13. Mariculture technology exchange between major producing countries in Philippines, Malaysia and Indonesia	WWF Denmark, WWF Philippines PCSD, BFAR Philippines and PALIFTA

## **8. Concluding Notes and Recommendations**

### **8.1. Workshop Summary**

This workshop was part of the response to the broad-based concern over dwindling fisheries resources in the face of growing global demand, in particular in relation to the LRFFT where external drivers of demand fuel unsustainable rates of extraction in source countries, with a number of ecological and socio-economic consequences being evident.

Disparate and uncoordinated efforts have been exerted over preceding years, and in some cases decades, in both source (supply) and consumption (demand) countries with limited success. While these ongoing LRFFT related programs continue to make important and effective efforts to address trade concerns, there remains a need for a more coordinated response that adopts a whole chain-of-custody approach across the entire supply and demand chain and that cuts across national boundaries and in some cases regional boundaries. The workshop was a focused activity to launch such a response.

In broad terms this workshop has met the targets and objectives as laid out in the Award Specifics (Appendix 1) in that it has:

- Identified, with some gaps, the status and trends of trade in LRFF at both the national and regional scale, and presented updates on biological status, socio-economic drivers and mariculture of LRFF species;
- Assessed existing the policy and regulatory framework at local and national levels in both source and demand economies;
- Presented cases studies on existing integrated programs and provided scenarios analysis of the future of the LRFFT under a “business-as-usual” approach;
- identified various biological, ecological and socio-economic indicators that if implemented could make the LRFFT a more functional, as opposed to sustainable, trade;
- Reviewed existing Standards to determine their current applicability and the efficacy of developing guidelines/best practices for managers and policy makers; and
- plotted the strategic roadmap to attain meet these indicators that is built on on-going programmatic efforts underway at the national and regional level that can be used to consolidate future efforts to make LRFFT a more lasting component of human food-security in the entire Coral Triangle.

## 8.2. Recommendations

Some of the important recommendations from this workshop are:

<p><b>While its generally accepted that over-exploitation is prevalent in the LRFFT, there remains considerable gaps in knowledge of LRFF stocks with little or no data available at national levels to inform management, while regulations do not exist for LRFF fisheries in most countries</b></p>	<p>There is limited capacity in-country to implement sophisticated monitoring programs to collect data: Priority science needs must be matched with in-country capacity to develop simplified approaches that can be used to identify “trends” in specific indicators (i.e. average fish weight and fish size). Efforts should be directed at:</p> <ul style="list-style-type: none"> <li>• developing simple “rules of thumb” yield estimates such as crude estimates of annual yields per linear or square kilometer of reef, under various conditions;</li> <li>• A review of legislation specific to live reef fish needs to be undertaken for countries engaged in the LRFFT;</li> </ul>
<p><b>The ongoing export of Illegal, Unreported and Unregulated LRFF by fishing vessels</b></p>	<p>Live transport boats continue to exploit limited enforcement capacity in remote parts of the CT region to illegally collect and export LRFF, which often include the CITES listed Humphead wrasse and other endangered grouper species.</p> <p>Regulation in Hong Kong that exempts registered fishing vessels from having to declare their cargo of live fish is hindering efforts at regulatory reform. Better outcomes will require that implementing prioritized actions at supply and demand-end of value chain such as:</p> <ul style="list-style-type: none"> <li>• imposing temporary moratoria to prohibit export of keystone species (i.e. HHW);</li> <li>• requiring exports only be permitted from designated ports under newly enacted Ports State Measures agreements;</li> <li>• supply country demonstration of commitment to reform such as forming industry alliance’s to pilot BMP among members</li> <li>• increased government to government dialogue between countries facilitated by NGOs (e.g. WWF) and regional platforms (e.g. USCTI)</li> </ul>
<p><b>There continues to be conflicting and disparate data on markets and trade and in particular trade of LRFF within mainland China</b></p>	<p>Scenario analysis and anecdotal reports suggests demand in the main consumer markets is evolving with China emerging as major source of increased demand for LRFF. This is evidenced by price for LRFF being as much as 50-75% higher than in traditional Hong Kong markets. Increased demand from China will be the major driver of sub-standard practices becoming more prevalent and perverse in their outcomes But “reliable” data on trade remains elusive. To enable more informed discussion</p>

	<p>between stakeholders there is a need for:</p> <ul style="list-style-type: none"> <li>• dedicated research and analysis of movements of LRFF between Hong Kong and mainland China and trends in prices is required and a substantial study should be conducted as a priority</li> <li>• There needs to be stronger engagement and relationships with government agencies in mainland China (e.g. Chinese Academy of Sciences) to implement MOUs and joint research programs;</li> </ul>
<b>In order to effect <u>real</u> change, whole supply chain-of-custody initiatives and refinement of existing business models must be supported</b>	<p>There is a need to work along the entire supply chain of the LRFFT, from reefs to dinner plates and to identify crucial intervention points for effecting change. In this context, management of the LRFFT would benefit from:</p> <ul style="list-style-type: none"> <li>• Multi-stakeholder initiatives being instigated at supply and demand ends of the market chain. This will require support from NGOs to link sellers and buyers interested in supporting more responsible capture and marketing of LRFF;</li> <li>• Business-models where traders of fish in source countries can be more “independent” can lead to improved stewardship of resources. As such initiatives that provide financial support (e.g. micro-credit, sustainable financing) for traders to exit from a “patronage” relationship will provide incentives for improved practices and longer sustainability horizons</li> </ul>
<b>Workshop outcomes need to be adopted into other regional and national programs to maintain a momentum</b>	<p>There are a number of current and ongoing LRFFT initiatives in the region the present an opportunity to continue to push for improvements in how the LRFFT is managed at national and regional scales. Efforts should be targeted at:</p> <ul style="list-style-type: none"> <li>• Identifying prioritized actions that require a trans-boundary and regional focus and making sure these are incorporated into national and regional work programs, agendas and activities such as: <ul style="list-style-type: none"> <li>○ USCTI LRFT Regional Exchange workshop (only CT6 or “source” countries);</li> <li>○ APEC FWG LRFT workshop (21-member economies including source and demand countries)</li> <li>○ Coral Triangle Support Program (CTSP) regional activities in CT6 countries</li> <li>○ National CTSP programs (e.g. in</li> </ul> </li> </ul>

	<p>Philippines and Malaysia)</p> <ul style="list-style-type: none"> <li>Utilize and leverage multiple donor agency support for LRFT activities from CTSP partners (e.g. NOAA) and external donors (e.g. DANIDA) in CT6 source countries (e.g. Philippines)</li> </ul>
<b>Wild-stocks are showing signs of heavy localized over-exploitation with culture of juvenile / undersize fish becoming a “livelihood” industry</b>	<p>In many locations, where stocks are heavily overfished, wild-caught juveniles are being captured for 'grow out' in cages until they reach market size – a practice that will be disastrous in the long term. In some countries governments are considering this as an “alternative livelihood. Caged fish don't contribute to replenishing wild stocks and high rates of extraction of live fish are already resulting in fishing down the food chain, with unknown long-term ecosystem impacts. Emphasis needs to be placed on “recovery” of stocks in relation to LRFFT.</p>
<b>With increasing demand for LRFF and with stocks already showing signs of overfishing, mariculture is being increasing identified as the means to meet future</b>	<p>Aquaculture will not solve the issue of resource overexploitation and other regulatory and livelihood measures are necessary to compliment it if sustainability remains the main goal . these include:</p> <ul style="list-style-type: none"> <li>stability in production, quality of product and adequate, but not over-supply is necessary for aquaculture industry to meet market expectations</li> <li>Promotion of full cycle responsible mariculture production in accordance with environmental best-practice;</li> <li>This is challenging where small-scale producers in remote locations dominate and increased emphasis on use of cooperatives is needed</li> </ul>
<b>Acknowledging that whole of supply chain approaches are needed to achieve reform in the LRFFT, there is a need to build and manage multi-stakeholder (government, NGOs and private sector) alliances</b>	<p>Extensive effort is needed to build agreement on those mechanisms or frameworks that can provide a platform for cooperative engagement with the private sector. These include</p> <ul style="list-style-type: none"> <li>refining and implementing measurable standards of best-practice such as the International LRFFT Standard with participation and support of all stakeholders</li> <li>establishing informal forums or networks to serve as a platform for dialogue and exchange in response to industry needs and building capacity among stakeholders to better manage the trade;</li> <li>training on the International LRFFT Standard as a voluntary Code of Practice for industry</li> </ul>

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## **APPENDIX 1**

### **TERM OF REFERENCE (TOR) AND AWARD SPECIFICS**

To support the initiative to conserve the resources of the Coral Triangle through regional collaboration including a more sustainable LRFFT, the US State Department provided WWF support to organize a regional workshop.<sup>10</sup> The workshop has the following objectives:

- A. Funding for an assessment of current status and trends of the LRFF trade in the Southeast Asia/Pacific region. Information included in the assessment should provide baseline data pertaining to major source countries, current policies and regulations, affected species, price trends, market demand, etc.
- B. This assessment can be executed in conjunction with the convening of a workshop on this same topic, designed to outline a roadmap and strategy to address the unsustainable aspects of the live reef food fish trade. This strategy may include a review of existing standards to determine current applicability, development of guidelines/best practices for managers and policy makers, and a training module to distribute the strategy to the appropriate audiences.
- C. Participants in the workshop should include experts with current information about the state of play of the LRFF trade, technical experts with knowledge of the long-term trends and shifts in the trade, managers from the demand side of the trade (i.e., Hong Kong, Singapore), managers from the supply side, in particular those from the Coral Triangle region.
- D. Outputs should deliver action consistent with the implementation of the Coral Triangle Regional Action Plan and should be consistent with the goals and objectives of the current Secretariat of the International Coral Reef Initiative.

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<sup>10</sup> US State Department . Undated. Awards Specifics. Standardized Assistance Instrument Identification Number: S-FJ600-09-GR-0XX



## U.S. Department of State Award Specifics

### DATA ELEMENTS:

1. **Standardized Assistance Instrument Identification Number:**  
S-FJ600-09-GR-0XX
2. **Amount of Award:** \$100,000 (One hundred thousand U.S. dollars)
3. **Purpose/Scope of Award:** This project is to organize and conduct a workshop to plan a roadmap and strategy to address the unsustainable trade in Live Reef Food Fish, including the development of best practices guidelines useful for the purpose of reforming the trade and to conduct an assessment of current status and trends of the trade in the Southeast Asia/Pacific region. Information included in this assessment should provide baseline data pertaining to major source countries, current policies and regulations, affected species, price trends, market demand, etc. This assessment can be executed in conjunction with the convening of the workshop. It may include a review of existing standards to determine current applicability, development of guidelines/best practices for managers and policy makers, and a training module to distribute the strategy to the appropriate audiences.

Participants in the workshop should include experts with current information about the state of play of the LRFF trade, technical experts with knowledge of the long-term trends and shifts in the trade, managers from the demand side of the trade (i.e., Hong Kong, Singapore), managers from the supply side, in particular those from the Coral Triangle Region.

Outputs should deliver action consistent with the implementation of the Coral Triangle Initiative's Regional Action Plan and should be consistent with the goals and objectives of the International Coral Reef Initiative. The grantee will be expected to provide:

- A. Logistics, including venue arrangements, transportation and per diem to participants as appropriate.
- B. Facilitation, including attendee invitation list and agenda preparation (with input from the Grants Officer), procurement of presenters, document preparation, information dissemination, and participant evaluation of the workshop and strategy.
- C. A final financial and program report on completion of workshop and evaluation of workshop and strategy.

4. **Grants Officer Contact Information:**

Joseph P. Murphy  
American Embassy, Suva, Fiji  
679-331-4466 x8166 (phone)  
679-330-2998 (fax)  
[murphyjp@state.gov](mailto:murphyjp@state.gov)

**5. Payment Method:**

The Standard Form 270 Request for Advance or Reimbursement will be utilized. Payments may be requested in the amounts required by the recipient to carry out the purpose of this award. The SF-270 must be certified by the appropriate person from within the grantee organization, numbered consecutively and identified for the period which payment is claimed. Each payment must be the amount of expenditures anticipated during the requested period less any unexpended funds remaining from prior payments. This information must be reflected on the Standard Form 270 submitted for payment.

When submitting a request for payment use the address provided on the DS-1909. Requests for payments must be submitted in sufficient time to allow at least fourteen (14) working days for processing.

**6. Post-Award Compliance:**

Department Of State Standard Terms and Conditions for Federal Assistance Awards are incorporated by reference and made part of this Notice of Award. Electronic copies containing the complete text are available at: <http://fa.statebuy.state.gov>. Printed copies will be provided to Recipient on request.

The Recipient and any sub-recipient, in addition to the assurances and certifications made part of the Notice of Award, must comply with all applicable terms and conditions during the project period.

**7. Authorized Budget Summary**

Budget Categories	Amount
1. Personnel	
2. Fringe Benefits	
3. Travel	
4. Equipment	
5. Supplies	
6. Contractual (Professional Services/Consultant fees)	
7. Construction	
8. Other Direct Costs	
9. Total Direct Costs (lines 1-8)	
10. Indirect Costs are based on the provisional rate of 12.5% of total direct costs.	
11. Total Costs (lines 9-10)	
12. Cost-Sharing	

Attached is the detailed budget.

## **8. Reporting and Monitoring**

The Recipient is required to submit a final certified financial report and program report must be submitted to the Grants Officer within 90 days after the award period end date. This report should include a copy of the assessment, roadmap/strategy, best practices, training materials and any other workshop outputs and materials.

**APPENDIX 2  
PARTICIPANT LIST**

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## APPENDIX 3

### INDUSTRY IMPORT TRENDS

The following figures (A-1 to A10), provide summary data on annual imports of Live Reef Food Fish (LRFF) into Hong Kong for the years 1999 to 2009. These data are presented as consolidated annual imports of all LRFF species as well as broken down into annual imports of the main LRFF species. The following notes will assist the reader in comprehending the data,

#### 1. Consolidated Annual Imports by Category – Figure A-1 and A-2

Consolidated imports data are presented in three categories; high value<sup>11</sup>, other grouper<sup>12</sup> and other marine fish<sup>13</sup> species.

LRFF are imported into Hong Kong via four main modes of transport; Air, Sea, Road and Fishing Vessels. Shipping by air is the most common mode of transport, accounting for between 65–70% of all imports followed by Fishing Vessels which account for between 25–30%. The remainder comes in mostly by sea with very little coming overland by road.

For imports landing in Hong Kong via air transport, data is collected by the Hong Kong Census and Statistics Department (CSD) using an international *Harmonized Code System* (HCS) which enables imports to be distinguished by key species and country of origin. While some inaccuracies persist (e.g. species identification), these data are seen as reliable estimates and, in the absence of data collected by source countries, are a valuable source of information.

For those imports landing in Hong Kong via Fishing Vessel, further explanation is needed. Under Hong Kong law, there is no requirement for the approximately 100 Hong Kong, licensed live-fish transport vessels to declare their imports of LRFF, the rationale being that under legislation Live Fish are not considered as “food” and hence do not need to be reported. In an effort to account for these imports, the Agriculture Fishery and Conservation Department (AFCD) estimates imports through voluntary reporting of a selection of these boats. These import data lack veracity with officially declared imports for this fleet estimated to be underreported by nearly half (Sadovy et al, 2003).

#### 2. Imports by Species and Country of Origin

Import data on individual LRFF species are presented by source country of origin, enabling source country trends to be identified.

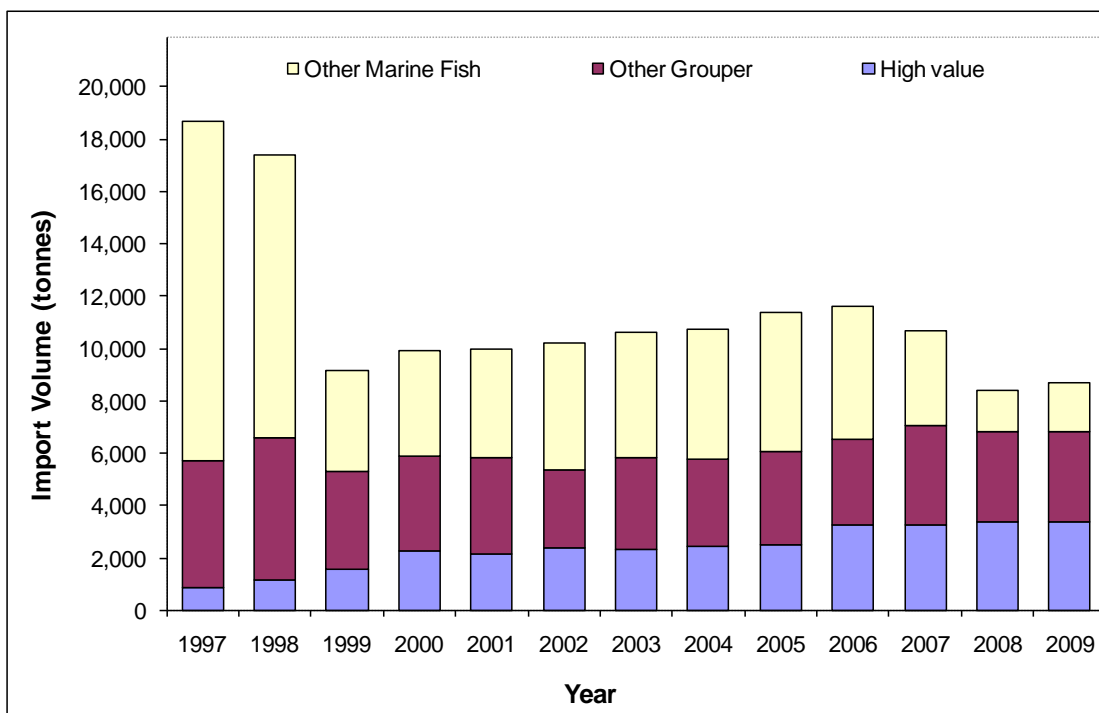
As noted above, data on imports are obtained from either the Hong Kong CSD or the Hong Kong AFCD, with the former accounting for imports by air and the latter being an estimate of imports by Hong Kong registered Fishing Vessels. In the figures below, these Fishing Vessel estimates are distinguished separately. The reason for doing this is an acknowledgement of the unreliability of these estimates, and to enable the reader to observe trends from the more reliable estimates provided by the Hong Kong CSD.

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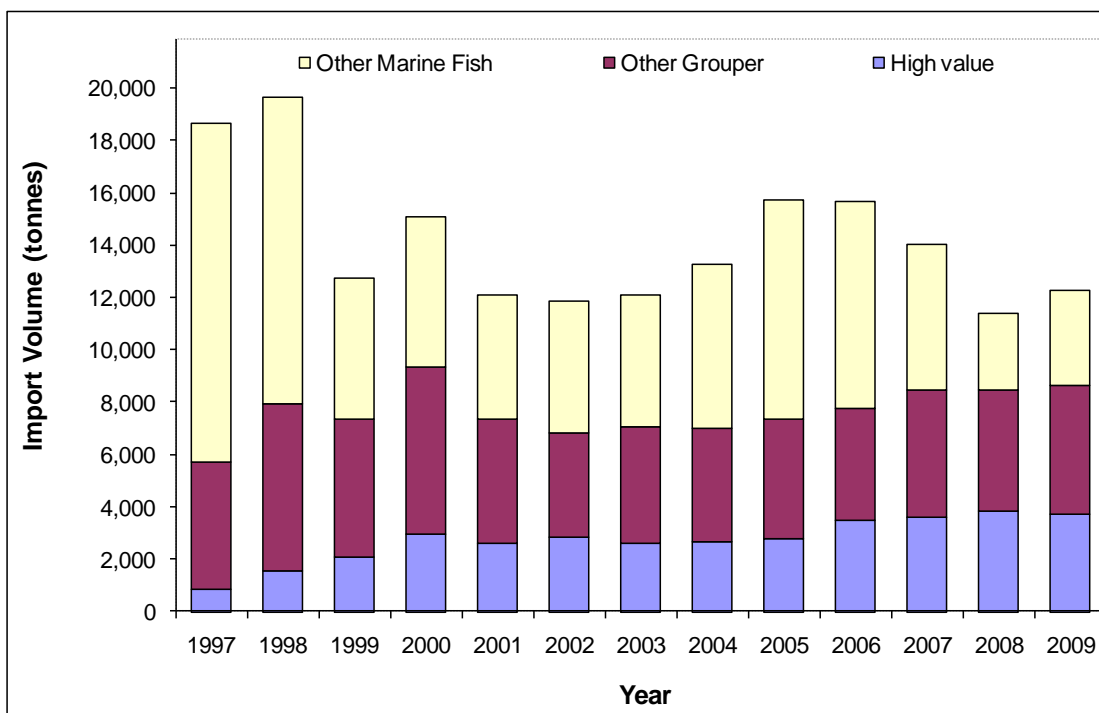
<sup>11</sup> Species include a) Highfin Grouper, b) Humphead Wrasse, c) Giant Grouper, and d) Coral Trout (Leopard and spotted)

<sup>12</sup> Species include a) Green Grouper, b) Tiger Grouper, c) Flowery Grouper, d) Other Grouper

<sup>13</sup> Species include a) Wrasses and Parrotfish, b) Snooks and Basses, c) Mangrove Snapper and d) Other Marine Fish

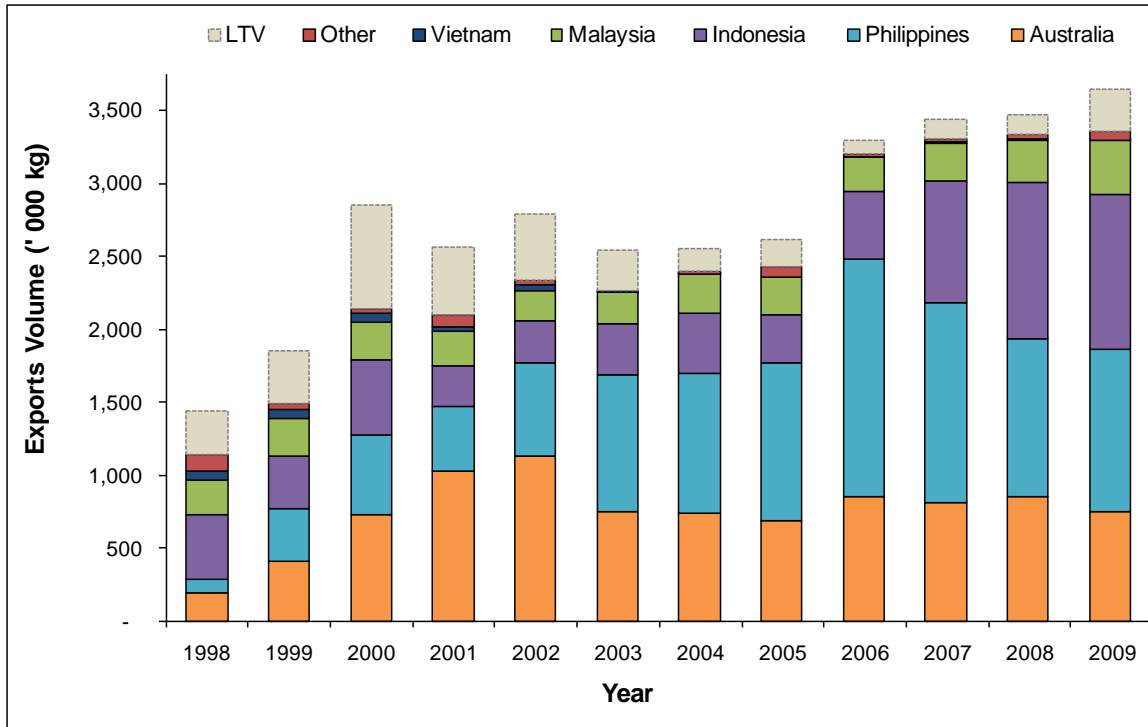


**Figure A-1:** Total imports of Live Reef Food Fish into Hong Kong for years 1997 to 2009 by category. Includes only import data provided by the HK CSD (i.e. Air transport)



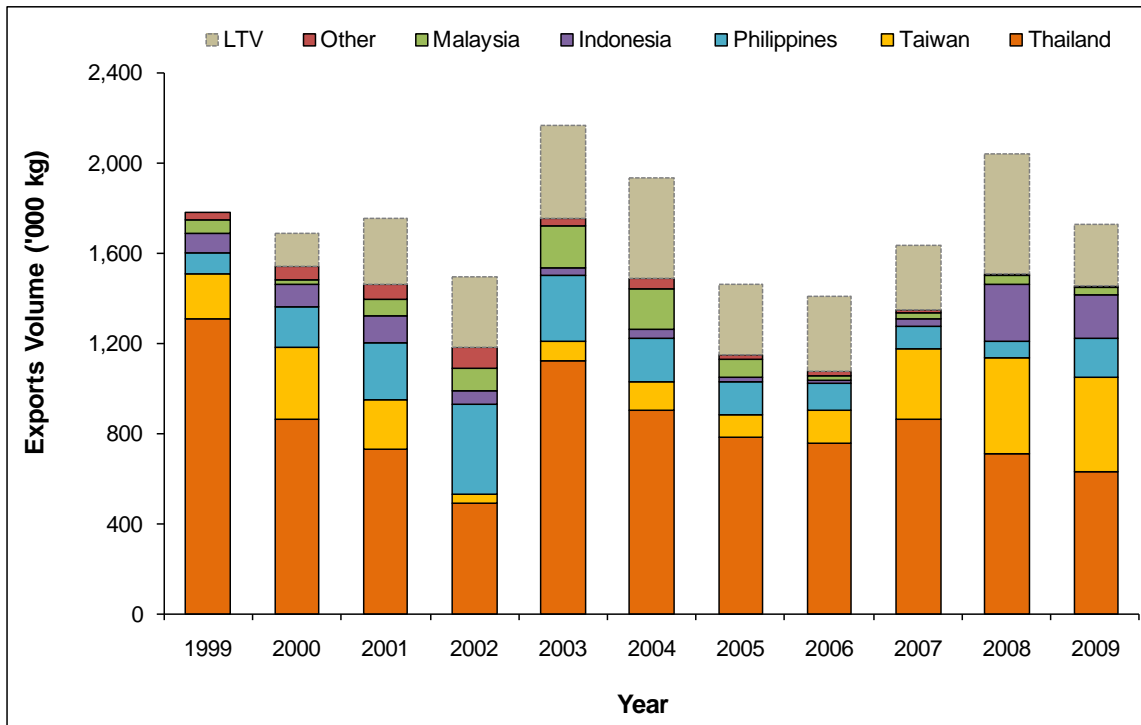
**Figure A-2:** Total imports of Live Reef Food Fish into Hong Kong for years 1997 to 2009 by category. Includes import data provided by the HK CSD (i.e. Air transport) and HK AFCD (i.e. Fishing Vessel)

(A) Leopard coralgrouper and Squaretail coralgrouper (*Plectropomus spp*)



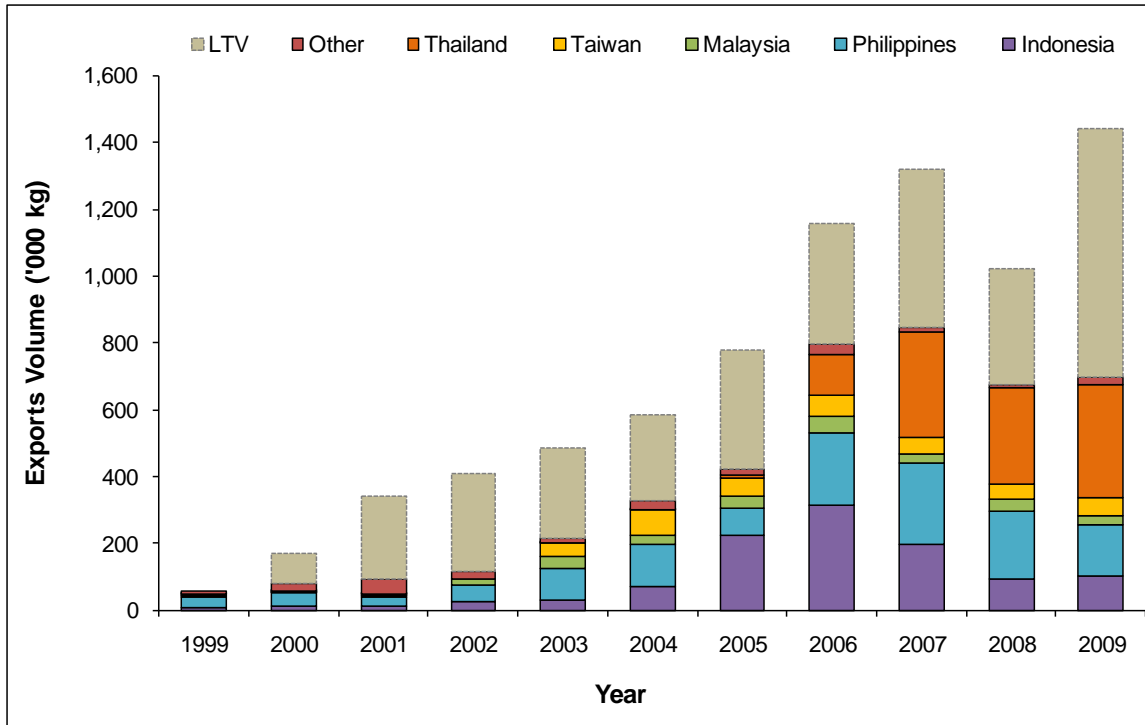
**Figure A-3:** Imports of Leopard coralgrouper and Squaretail coralgrouper from 1998 to 2009 by source country. Imports noted as LTVs are an 'estimate' of landings from fishing vessels

(B) Green grouper (*Ephinephelus Coioides*)



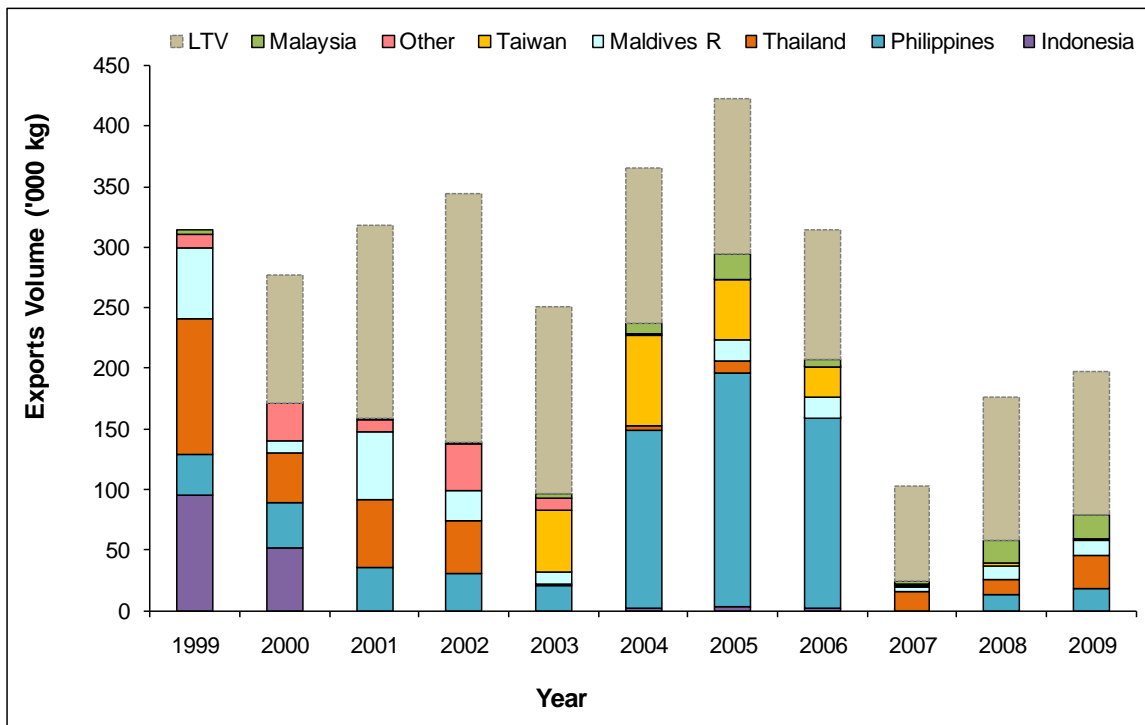
**Figure A-4:** Imports of Green grouper from 1999 to 2009 by source country. Imports noted as LTVs are an 'estimate' of landings from fishing vessels

(C) Tiger grouper (*Ephinephelus Fuscoguttatus*)



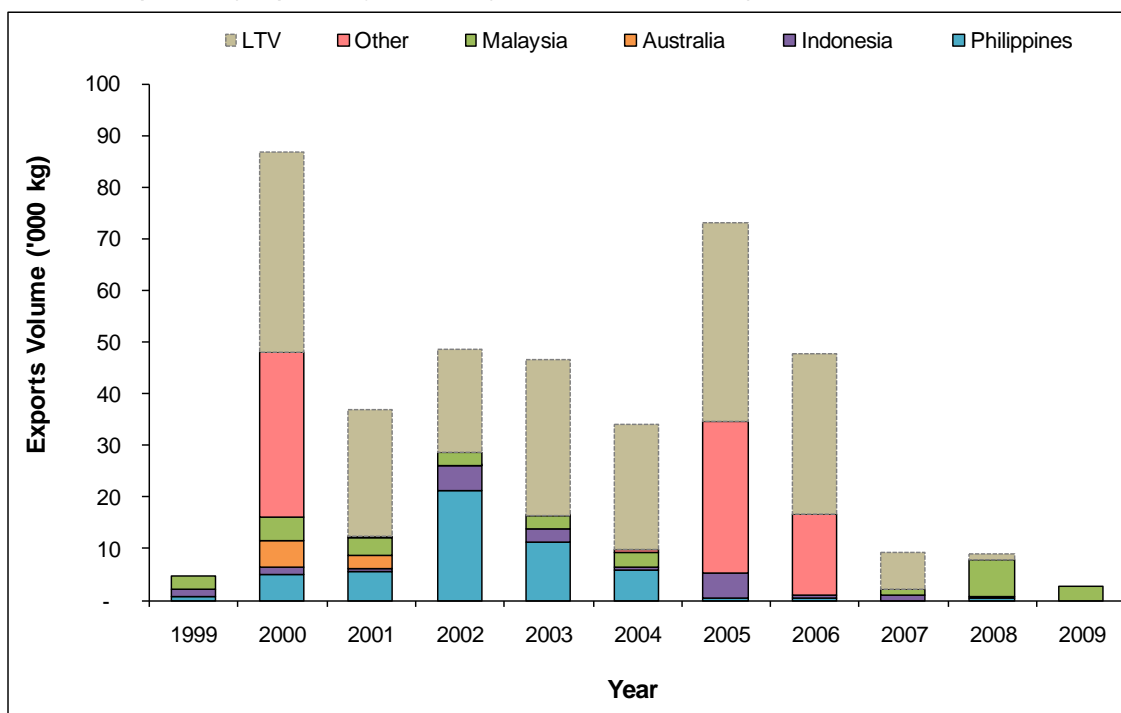
**Figure A-5:** Imports of Tiger grouper from 1999 to 2009 by source country. Imports noted as LTVs are an 'estimate' of landings from fishing vessels

(D) Flowery grouper (*Ephinephelus Polyphekadion*)



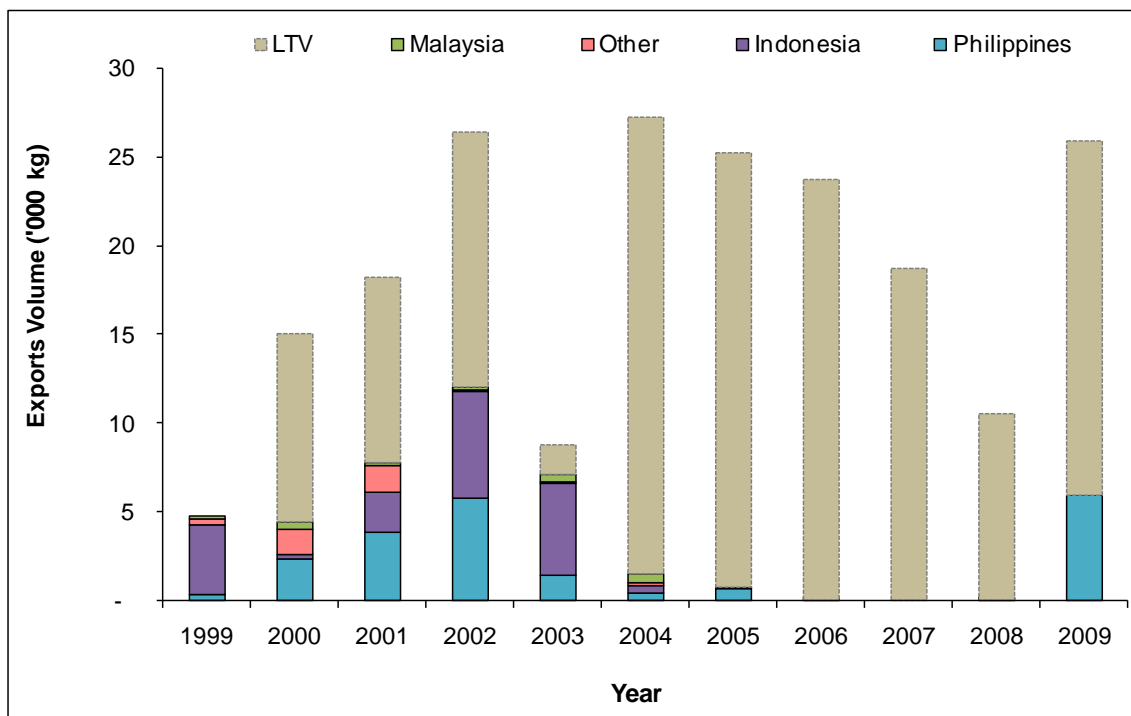
**Figure A-6:** Imports of Flowery grouper from 1999 to 2009 by source country. Imports noted as LTVs are an 'estimate' of landings from fishing vessels

(E) Humphead (Napoleon) wrasse (*Chelinus Undulatus*)



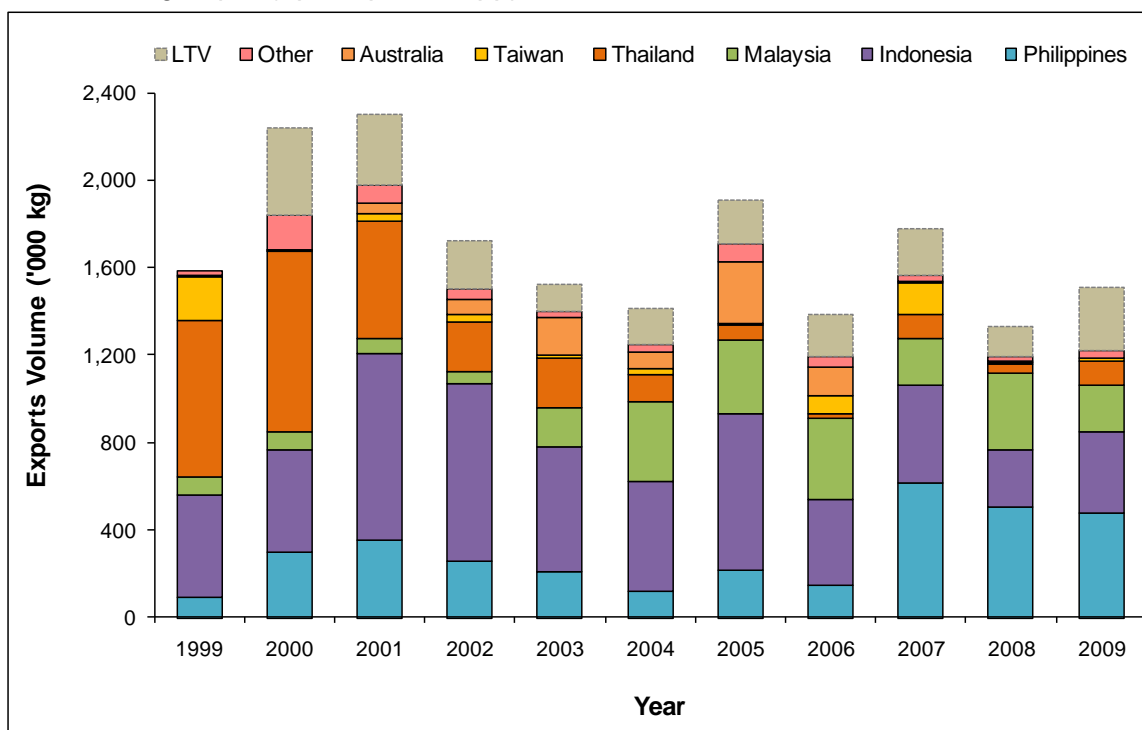
**Figure A-7:** Imports of Humphead (Napoleon) wrasse from 1999 to 2009 by source country. Imports noted as LTVs are an 'estimate' of landings from fishing vessels

(F) Highfin grouper (*Cromileptes Altivelis*)



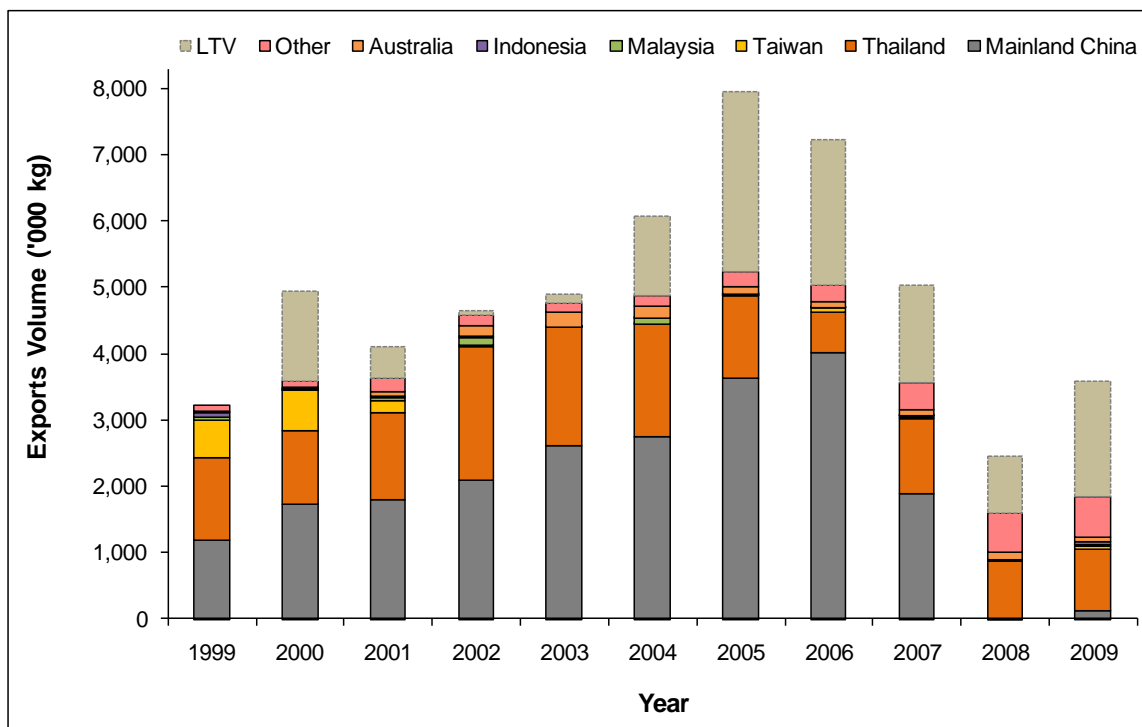
**Figure A-8:** Imports of Highfin grouper from 1999 to 2009 by source country. Imports noted as LTVs are an 'estimate' of landings from fishing vessels

(G) Other grouper (*Ephinephelus spp*)



**Figure A-9:** Imports of “Other grouper) from 1999 to 2009 by source country. Imports noted as LTVs are an ‘estimate” of landings from fishing vessels

(H) Other “marine” fish



**Figure A-10:** Imports of Other “marine” fish from 1999 to 2009 by source country. Imports noted as LTVs are an ‘estimate” of landings from fishing vessels

## **APPENDIX 4**

### **WWF's Coral Triangle Program**

Recognizing its severe threat to coral reef and marine biodiversity on one hand and its economic importance on the other, WWF endeavors to build a sustainable LRFFT. This effort is one of the five components of its Coral Triangle Program.<sup>14</sup> As part of this effort, WWF has been working with stakeholders at the local level in source countries including the government and industry to change the mode of resource use from purely market-driven to one that will be more closely in step with the natural reproduction rate.

- ICRI
- the State Dept

The local effort the past two years on the part of the government of Indonesia, Malaysia, the Philippines and to a certain extent Papua New Guinea includes strengthening of enforcement systems, locating spawning population aggregation sites (SPAGS), promulgating export control measures and conducting initial steps to promote the expansion of full-cycle aquaculture.

On the part of the industry, all supply-side players in Palawan, the current hub of Philippine LRFFT, have organized into formal groups to ease their engagement in the sustainability effort while Indonesia and Malaysia plan to do the same.<sup>15</sup> In the Philippines the government-industry engagement produced sustainability plans at the provincial and municipal levels.<sup>16</sup> The industry in Indonesia is also training fishers on better fish handling to improve quality and reduce mortality. The WWF Coral Triangle Program has supported a number of these local efforts through conduct technical studies, provision of technical information and facilitating the engagement and coming together of various stakeholders groups.

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<sup>14</sup> The other components of WWF's Coral Triangle Program are the following: promotion of sustainable tuna fisheries, financing of marine protected areas, protection of marine turtles and reducing their by-catch and reduction of the impacts of climate change.

<sup>15</sup> The province of Palawan is designated by Philippine law as a special biodiversity zone and is also the current center of LRFFT in the Philippines being a principal source and shipment hub.

<sup>16</sup> The Palawan LRFFT Sustainable Provincial Framework Plan (2009-2013) in turn generated the ten-year LRFFT Municipal Sustainable Plan (2010-2020) for Taytay. The municipality of Taytay is the biggest source and shipper of live food fish in Palawan.



## **APPENDIX 5**

### **WORKSHOP CONCEPT PAPER AND AGENDA**

#### **Introduction**

Consumption of live reef fish for food has long been popular in Chinese culture. Fish are caught on reefs in the Coral Triangle and shipped mostly to Hong Kong and mainland China, but also Singapore and Malaysia, being kept alive until just before cooking. The live reef food fish trade (LRFT), which focuses on grouper and wrasse species, has been identified as a serious threat to coral reef ecosystems and biodiversity in the region through impacts arising from: overfishing, including targeting of juveniles for grow-out and spawning aggregations; and the use of destructive fishing practices, such as cyanide and other destructive fishing gears.

Just as important are the socio-economic impacts from the LRFT. While presenting opportunities for coastal communities to derive substantial incomes, in reality these benefits are short-term and often come at considerable economic and social, as well as ecological, cost. The legacy of the trade is becoming evident across the Coral Triangle: degraded habitats, depleted resources and loss of reef fish spawning aggregations. Resource dependent communities that have responded to the economic incentives of the trade are now faced with the loss of local livelihoods and worsening poverty. This combination of poverty and limited income generating opportunities and increasing demand from the main consumer markets in the region continues to drive this trade to further deplete overfished resources. Paradoxically the “business model” being reinforced by demand-side traders is clearly economically unsustainable in the long-term, and yet little effort to date has gone into engaging with industry.

Ambitious conservation targets, including for the LRFT, are being pursued by governments and partners in the Coral Triangle that demand a new level of engagement, advocacy and action – a level of engagement that is capable of stimulating attention and commitment to change amongst key decision makers. Despite a concerted effort over the past decade to reduce the social, economic and biological impacts of the LRFT, it continues to pose major challenges for the future sustainable use of this marine resource. While NGOs and others maintain ongoing LRFT related programs and continue to make important and effective efforts to address trade concerns, there remains a need for a more concerted and ongoing effort to forge partnerships with those that matter; with business, industries and governments to support action at a scale that matters.

As a first step in what is expected to be a series of regionally focused events over the next eighteen months to support existing work at the national levels and to complement the national plans of action being adopted by countries with the CT, WWF is co-organizing a LRFT workshop at which it is hoped the governments of the six CT countries, the private sector, non-government organizations, regional agencies and institutions and practitioners will come together to plan a roadmap and strategy to address the unsustainable trade in Live Reef Food Fish.

#### **Overall objectives**

This is intended to be primarily a technical workshop, focused on bringing together practitioners to present the most up-to-date information on the Live Reef Food Fish Trade

The workshop is being organized and conducted to identify and prioritize key gaps in knowledge and regulation and to define a roadmap and strategies to address this unsustainable trade. Specific goals of the workshop will be to:

5. To provide a snapshot of the current status and trends for the LRFT and to share information on past and current efforts at national and regional scales to address issues related to the sustainable management of the LRFT. The emphasis will be on communicating the most up to date information and identifying existing knowledge gaps. Presentations will cover:
  - a. trade data trends for major source and consumer countries, price trends and market demand forecasting;
  - b. Status of targeted species, including vulnerable and endangered species;
  - c. Current policies and regulations and associated monitoring and enforcement, including multi-lateral agreements and new initiatives;
  - d. Trends in mariculture production including full-cycle and capture-based mariculture;
6. Identify lessons learned and factors contributing to the successes and failures of past and current LRFT programs and explore reasons why efforts to date have not resulted in sustainable management;
7. To jointly explore, develop and analyze demand-side and supply-side strategies at national and regional scales that can strengthen partnerships between governments, NGO's, institutions and the private sector; and to review existing International Standards to determine current applicability and development of guidelines on best practices for managers and policy makers, including EAFM,

### **Objectives and Outputs**

1. To identify key requirements and constituencies that will enable the progression of the LRFFT toward sustainability;
2. To identify and prioritize information and implementation gaps needed to address sustainability including trade data, policy and regulation, agency support and partnerships
3. From #2 above, develop a matrix of "core" fundable activities that will contribute to and address sustainability issues in the LRFFT and establish fundamental capacity-building needs;
4. Secure the participation of the private sector and establish consensus to continue working together to implement sustainability programs and activities;
5. To identify specific actions and outputs that can feed into and be supported through the implementation of the Coral Triangle Initiative's Regional Plan of Action and other proposed regional activities; and
6. A preliminary review of and recommendations for strengthening existing bi-lateral or multi-lateral fora or platforms

## Workshop Implementation

The workshop will bring together around 50 local, regional, and international participants from industry, scientific, economic, and financial and policy-making (environmental, fisheries and trade) sectors relevant to the Coral Triangle region. Of note will be representation from those on 'the demand side', from outside the region seeking greater sustainability of their business supply chains.

Special emphasis will be given to experts with current information on the LRFF trade, technical experts who can contribute knowledgeably to predictions of long-term trends and shifts in the trade and managers from supply side countries, in particular those from the Coral Triangle Region. Every effort will be made to have present managers from the demand side of the trade (i.e. Hong Kong, Singapore) as well as industry representatives from both demand and supply-sides of the trade. Overall the workshop will be structured as follows:

- Day 1: "Discovery and Provocation" – What might a sustainable LRFFT look like? What is needed to inform and support that? What information is available to support that outcome and more importantly what information is missing? What do past and current efforts tell us about how to more sustainably manage the LRFT?
- Day 2: "Provocation/Stimulation and Collaboration" – What do past and current efforts tell us about how to more sustainably manage the LRFT? What are national and regional solutions to develop stronger partnerships between stakeholders and deliver real outcomes for sustainably managing the LRFT? Can the private sector/industry be a willing partner in that?
- Day 3: "Alignment" – Begin the process of delivering a consensus on a "common regional framework and identify specific actions and output/outcomes that can feed into other regional activities. Can 'voluntary best-practices really be applied and at what scale?

**Workshop Agenda**  
**Roadmap to a Sustainable Live Reef Food Fish Trade**  
**Diamond Room 5/F, Cityview Hotel, Hong Kong**  
**November 10<sup>th</sup> – 12<sup>th</sup>, 2009**

**Tuesday, 10<sup>th</sup> November 2009 – DAY 1**

Session Objective: To establish a consensus around how a sustainable LRFFT might be defined and operated

- 08:30–09:00    Registration and Coffee
- 09:00–09:15    Opening Remarks – Mr. Eric Bohm, CEO, WWF Hong Kong  
                    “The Business of Sustainability”, and the natural, social and economic ‘value’ of the region.
- 09:15–09:30    Facilitator – Mr. Raoul Acola  
                    *“Introduction of participants and overview of workshop objectives and output goals and agenda outline”*
- 09:30–09:50    Dr. Nygiel Armada  
                    *Sustainable coastal fisheries: What are the elements of sustainability, what are the emerging threats and how can we achieve resilient outcomes for coastal communities*
- 09:50–10:20    Mr Lee Choi Wah, Chairman, Hong Kong Chamber Seafood Merchants  
                    *“Industry and sustainability: Is it a consideration and what are the most important issues from an industry perspective”*
- 10:30–10:50    Tea Break

**Session 1: Setting the Scene**  
**Ecology and Biology (Session Chair: Raoul Acola)**

- 10:50–11:10    Dr. Geoffrey Muldoon, Strategy Leader, WWF Coral Triangle Program  
                    *“The Live Reef Food Fish Trade: A decade of intervention and where are we now: A straw man for a functional LRFT”*
- 11:10– 11:40    Professor Yvonne Sadovy, Hong Kong University  
                    *“The biological and ecological impacts of the trade in live reef food fish: How much don’t we know?” (PLUS SPAGs)*
- 11:40– 12:00    Professor Ketut Sugama, Indonesia Directorate of Aquaculture  
                    *“Trends and current status in full-cycle and capture-based mariculture production”*
- 12:00–12:40    Facilitated discussion and priority setting for indicators
- 12:40 - 13:30    LUNCH BREAK (Buffet at Restaurant )

**Session 2: The Voice of Industry  
Challenges and Opportunity  
(Session Chair: Raoul Acola/Bronwen Golder)**

Objective: A clear profiling of industry realities - exploring the barriers and challenges to sustainability, what are the economic and management opportunities, what is the potential for future collaboration (i.e. explore a shared vision of economic, social and biological/ecological sustainability)

- 13:30 – 13:45 Facilitator (Raoul Acola)  
*Welcome and Introduction –Meeting recap and discussions objectives*
- 13:45 – 14:15 Jay Clark, Australian Live Reef Fish Buyer and Exporter  
*“The Live reef fish trade in Australia: Making a profit in a highly regulated fishery*
- 14:15 – 15:30 Industry Panel Session (Jay Clarke, AustAsia Seafood’s, Australia; Lloyd Moskalik, Oceanethix, Hong Kong; Heru Purnomo, Pulau Mas, Indonesia, Andy Yik, Hong Kong Chamber of Seafood Merchants, Hong Kong; Siong Tam, Golden Harvest, Malaysia; Sandra de La Cruz, PALIFTA, Philippines)
- Facilitated panel with panel member focusing on specific questions concerning:
- From an industry perspective, what would a more sustainable LRFFT look like in terms of biological and economic functioning
  - Possible indicators of health and sustainability from industry perspective?
  - What constraints and issues hinder the LRFT becoming more sustainable?
  - Where are the opportunities for industry to contribute to a more sustainable LRFFT
- 15:30 – 17: 15 Cross-sectoral Dialogue sessions by country  
Themes emerging from the presentations and panel discussions will be discussed with break-outs to be based at a country level.
- These closed dialogue groups will explore the connection between the realities of the LRFFT and previous discussions about moving the trade toward being more sustainable and what might the indicators of how that could be achieved
- 17:15 – 17:30 Ms Kelly Milton, Foreign Affairs Officer, Office of Ecology and Natural Resource Conservation, U.S. Department of State  
*“The US commitment to the Coral Triangle Initiative (CTI) and the LRFFT as a key thematic issue within the CTI program”*
- 17:30 – 17:45 Wrap and Close Day 2
- 18:15 – 19:15 Working Reception

### **Wednesday November 11<sup>th</sup> 2009 – DAY 2**

Structure: Morning – Key presentations then break-outs. Morning and afternoon continue break outs

- 08:20–08:30 Assemble, Coffee
- 08:30–09:00 Recap on main issues from Day 1 (Kelly Milton US Department of State)
- 09:00–10:00 Country Reporting: Breakout Group Result
- 10:00–10:30 Tea Break

#### **Session 3: Policy and Regulation: From Provincial to Regional (Session Chair: Joel Palma)**

- 10:30-10:50 Dr Michael Fabyini, Australian National University  
*“The Politics of Patronage and Live Reef Fish Trade Regulation in Palawan, Philippines and social drivers of illegal fishing”*
- 10:50–11:10 John Pontillias, Policy Research Division Palawan Council for Sustainable Development AND Mr Edwyn Alesna, Section Chief, Licensing and Permits, BFAR  
*“National and Provincial policy, regulation and enforcement: The Palawan live reef food fish trade”*
- 11:10–11:30 Mr Lawrence Kissol, Fisheries Manager, Department of Fisheries Sabah  
*“LRFT Management in Sabah, Malaysia : Issues & Challenges”*
- 11:30–11:50 Dr. So Ping-man, Deputy Director, Hong Kong Agriculture Fisheries and Conservation Department, Fisheries Section  
*“Overview and Regulation of Live Reef Fish Trade in Hong Kong”*
- 11:50–12:45 Facilitated Plenary session (Policy questions for discussion include)
- What are the policy drivers across the CT? (Community perspectives to regional)
- Where to policy trends and industry realities converge?
- Are there policy gaps (national / regional)?
- Can policy provide incentives for a move of the LRFFT toward sustainability?
- 12:45 -14:00 Lunch
- Please note there will be a separate media luncheon being held, hence the slightly longer luncheon period )

**Session 4: What are the Realities of a Functional LRFT?  
(Session Chair: Raoul Acola)**

- 14:00 – 14:20 Dr Roehl Briones, Senior Research Fellow, Philippine Institution for Development Studies  
*“Scenario planning for supply and demand of live reef fish based on projections of market growth”*
- 14.20- 14.40 Mr. Peter Scott, Vice President, Global Competitiveness Consulting Limited  
*From idealism to pragmatism: Practical solutions for strengthening the International Standard for the Trade in Live Reef Food Fish*
- 14.40 – 15.00 Mr. Joel Palma, Vice President Programs, WWF Philippines  
*Palawan as a case study for an integrated inter-disciplinary approach to addressing the sustainable management of the LRFT:*
- 15.00-15.30 Panel discussion / Q&A - What could a sustainable LRFFT look like across the Coral Triangle were it to be functioning across multiple sustainability levels?
- 15.15-15.30 Tea Break

**Session 4: What are the Realities of a Functional LRFT? (Continued)  
(Session Chair: Raoul Acola/Bronwen Golder)**

- 15.30 – 17.00 Breakout Groups – What is required to achieve a functioning and sustainable LRFFT - From the country to the thematic?  
  
These will be thematic breakout groups tasked with critically looking at previous sustainability indicator’s discussions and identifying “realistic” opportunities for moving the LRFFT toward sustainability including what the markers might be and what data is needed to support those markers
- 17: 00 – 17:45 Reporting and Feedback
- 17:45 – 18:00 Wrap and Close Day 2
- 19:00 – 21:00 Workshop Dinner

**Thursday November 12<sup>th</sup> 2009 – DAY 3**

Structure: Recap and plenary overview, Break outs, Plenary and Next steps and Wrap-up

- 08:20–08:30 Assemble, Coffee
- 8:30 – 09:00 Mr. Timothy Lam, Fisheries Officer, WWF Hong Kong  
*“Hong Kong as the gateway to the LRFT: Re-exports into mainland China and pricing and trade discrepancies”*



- 09:00–10:00 Recap of Workshop Discussions and Outcomes (presented by a panel whose task it is to review workshop outcomes this far including:
- What would a functional LRFFT that is moving toward sustainability look like and what might be the indicators of that;
  - How can the existing LRFFT become more functional in terms of sustainability;
  - What are the issues, challenges and opportunities (e.g. industry, information/data and systems gaps;
  - How can each country and/or sector contribute to a more functional and sustainable LRFFT

**Session 5: The Road Ahead**  
**(Session Chair: Raoul Cola)**

- 10:00 – 10.30 Opportunities and platforms for future dialogue, political and industry commitment and national and regional collaboration  
(Raoul Acola / Lida Pet Soede / Geoffrey Muldoon)
- 10:30–10.45 Tea Break
- 10.45-11.30 Prioritization of Proposed Actions and Facilitated Discussion  
Break-out groups to identify what are needed and why it is needed and by when it is needed. This discussion will include mechanism and platforms that can help deliver these agreed meeting outcomes
- 11.35-12.30 A Commitment to Action for Regional and Sub-regional Platforms and Opportunities to Pursue: Facilitated Session
- APEC ; Dr Geoffrey Muldoon;
  - USCTI, CTSP; Dr Lida Pet-Soede
  - BIMP-EAGA; Raoul Cola
- 12:30 - 13:30 LUNCH BREAK (Buffet at Restaurant Name?)
- 13.30 - 14.45 Plenary Discussion - Functionality implications of prioritized actions across sectors and themes and immediate actions to carry workshop results forward
- 14.45 - 15.00 Wrap Up and Closing



**Why we are here**

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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