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ASIA-PACIFIC FISHERY COMMISSION (APFIC)

Sixth APFIC Regional Consultative Forum Meeting (RCFM)

**Promoting Blue Growth in fisheries and aquaculture
in the Asia-Pacific**

Colombo, Sri Lanka, 8–10 February 2016



ASIA-PACIFIC FISHERY COMMISSION (APFIC)

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Preparation of this document

This is the final report of the Sixth APFIC Regional Consultative Forum Meeting: *“Promoting Blue Growth in fisheries and aquaculture in the Asia-Pacific”* convened in Colombo, Sri Lanka 8–10 February 2016. Authored contributions are reproduced as submitted.

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Members of APFIC
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Foreword

The “Blue Sectors” of fisheries and aquaculture make a significant contribution to food and nutrition security and the livelihoods of millions of people around the world. Seafood products are among the most traded commodities globally. The sectors are even more important in the Asia-Pacific region, which has 87 percent of global aquaculture and 51 percent of capture fisheries production.

In recent years, capture fisheries production has levelled off as more fisheries have become fully or over exploited. Fish stocks face threats not only from overexploitation but also marine pollution, habitat modification and habitat destruction. Increasing pressures on the sector from rising demand, population growth and human activities are further compounded by the effects of climate change. Aquaculture production, which faces its own challenges, has been rising steadily to fill the gap, now accounting for more than half the seafood consumed in Asia and the Pacific. Going forward, FAO predicts a continued increase in consumer demand for fish.

The FAO Blue Growth Initiative (FAO-BGI) has two main objectives. The first aims to support member countries in the conservation and sustainable management of healthy ocean ecosystems. The second aims to develop more productive and sustainable ocean-based economies.

The Sixth Asia-Pacific Fishery Commission (APFIC) Regional Consultative Forum Meeting (RCFM) focussed on *“Promoting Blue Growth in fisheries and aquaculture in the Asia-Pacific.”* The forum successfully provided member countries, partners and regional organizations, a platform to present progress, discuss key issues and make recommendations to FAO on this key area of the Organization’s work.

The member countries of APFIC and other organizations in the region, reported that they are fully engaged in a wide range of activities that involve many of the key elements of Blue Growth. Stakeholders recognized that promoting Blue Growth in the fishery and aquaculture sectors would continue to provide sustainable benefits in terms of food security, human well-being and environmental integrity.

A further range of opportunities to promote Blue Growth in the region’s inland and marine fisheries and aquaculture were also identified. These include the application of Ecosystem Approach to Fisheries Management (EAFM) and efforts to reduce overfishing and combat Illegal, Unreported and Unregulated (IUU) fishing.

The forum agreed that Blue Growth approaches in aquaculture could contribute significantly to meeting the increasing demand for fish in the region. This would require both improved efficiency in production, sustainable intensification and expansion of production areas. In countries with very limited aquaculture development, rapid growth in aquaculture may be expected because of technology transfer and increased demand as prices for fish rise.

The commitment shown by member countries, regional organizations and partners during the forum reinforced the important role that APFIC continues to play in the Asia-Pacific region. This includes sharing of information and knowledge and raising awareness of existing and emerging fisheries and aquaculture issues. These benefits highlight the importance of FAO in providing a neutral forum where regional challenges in the fisheries and aquaculture sectors can be actionably considered.



Kundhavi Kadiresan
Assistant Director-General and Regional Representative
FAO Regional Office for Asia and the Pacific

Abbreviations and Acronyms

ABNJ	Area Beyond National Jurisdiction
APFIC	Asia-Pacific Fishery Commission
ASEAN	Association of Southeast Asian Nations
ARFMM	ASEAN regional fisheries development and management mechanism
ARI	Aquaculture Regional Initiative
BGI	The FAO Blue Growth Initiative
BMP	Better Management Practice
BOBP-IGO	Bay of Bengal Programme Inter-Governmental Organisation
BOBLME	Bay of Bengal Large Marine Ecosystem Project
CCRF	Code of Conduct for Responsible Fisheries
COFI	FAO Committee on Fisheries
COFI-AQ	FAO COFI Sub-Committee on Aquaculture
CPUE	Catch Per Unit Effort
CTI	Coral Triangle Initiative
CTNI	Coral Triangle Network Initiative
EAF	Ecosystem approach to fisheries
EAFM	Ecosystem Approach to Fisheries Management
EEZ	Exclusive economic zone
EMS	Early Mortality Syndrome
ETP	Endangered Threatened and Protected
FAO	Food and Agriculture Organization of the United Nations
FMA	Fisheries Management Area
GAP	Good Aquaculture Practice
GEF	Global Environment Facility
GHG	Greenhouse gases
GCP	Government Cooperation Programme
HACCP	Hazard Analysis and Critical Control Point
ICSF	International Collective in Support of Fishworkers
IPOA	International plan(s) of action
IUU fishing	Illegal, Unreported and Unregulated fishing
LME	Large marine ecosystem
MRC	Mekong River Commission
MCS	Monitoring, control and surveillance
MDF	Multi Donor Fund
MMPA	The Marine Mammal Protection Act (USA)
MPA	Marine protected area
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield
NACA	Network of Aquaculture Centres in Asia-Pacific
NAPA	National Adaptation Programme(s) of Action
NPOA	National plan(s) of action
PSA	Productivity Susceptibility Analysis
PSM	Port State Measures
PSMA	FAO Port State Measures Agreement
RAP	Regional Office for Asia and the Pacific
RCFM	APFIC Regional Consultative Forum Meeting
RFLP	Regional Fisheries Livelihoods Programme
RFMAC	Regional Fisheries Management Advisory Committee
RPOA	Regional plan(s) of action

SACEP	South Asia Co-operative Environment Programme
SEAFDEC	Southeast Asian Fisheries Development Center
SPF	Specific Pathogen Free
TAC	Total allowable catches
TCP	Technical Cooperation Programme
TCPF	FAO Technical Cooperation Programme Facility
UNFCCC	United Nations Framework Convention on Climate Change
VMS	Vessel monitoring system
WCPFC	Western and Central Pacific Fisheries Commission
WorldFish	WorldFish Center
WWF	World Wildlife Fund

Executive Summary

This is the report of the Sixth Asia-Pacific Fishery Commission (Sixth APFIC) Regional Consultative Forum Meeting (RCFM) on *“Promoting Blue Growth in fisheries and aquaculture in the Asia-Pacific.”* The meeting was convened at the Taj Samudra Hotel in Colombo, Sri Lanka 8–10 February 2016.

Background to the Sixth APFIC RCFM

The Sixth APFIC RCFM on *“Promoting Blue Growth in fisheries and aquaculture in the Asia-Pacific”* was attended by 54 participants from 15 countries together with representatives from nine regional partner organizations and projects. The Ministry of Fisheries and Aquatic Resources Development, the Government of Sri Lanka, the Food and Agriculture Organization of the United Nations (FAO) and the APFIC hosted the meeting.

This Sixth APFIC RCFM preceded the Thirty-fourth Session of APFIC and served as a regional briefing on the activities of the Commission and its member countries. It also provided an opportunity to get an update on the work of various regional partner organizations that are relevant to the programme of work of the Commission. The APFIC RCFM was requested to develop and agree on ways of implementing policies and action plans developed to address major issues of importance to the region.

The Sixth RCFM was organized around six thematic sessions and a final session dedicated to developing RCFM summary recommendations to present to the Thirty-fourth Session APFIC.

The thematic sessions were:

- Regional overview of Blue Growth in fisheries and aquaculture, including the FAO-BGI.
- Country and regional initiatives on Blue Growth approaches in inland and marine fisheries
- Blue Growth in Asian aquaculture
- Country and regional examples of Blue Growth aquaculture systems
- Working group sessions on opportunities for Blue Growth in inland and marine fisheries and aquaculture in the APFIC region,
- Priorities and opportunities for Blue Growth in fisheries and aquaculture in the APFIC region

The RCFM considered the reviews of regional fisheries and aquaculture, presentations by member countries and regional organizations, reports of action plans of APFIC regional consultative workshops and the major issues outlined in the agenda and developed a report and recommendations to inform the APFIC session.

The RCFM recognized the very valid and important work in sustainable fisheries and aquaculture development being undertaken by various APFIC members, regional institutions and processes.

Opening of the meeting

The APFIC Chair, Ms W.M.M.R. Adikari, Secretary, Ministry of Fisheries and Aquatic Resources Development, opened the meeting and welcomed participants. She stressed the importance of APFIC and its nearly 70 years of cooperation. She outlined how Sri Lanka saw the Blue Growth theme of the meeting to be current and appropriate. It was a priority for the sector in the region and also in Sri Lanka where the development of renewable energy biotech, coastal zone management and tourism were all seen as an integral part of its Sea Identity. Blue Growth would also strengthen livelihoods food security and provide income. As part of the Blue Growth approach it was important to look at other livelihoods from the ocean. Whilst some progress has been made on overfishing, many areas of the sector needed more work. These needed a macro level development strategy, which would include inland fisheries, aquaculture and marine fisheries. These all needed to be aligned to meet international objectives, including implementation of the Code of Conduct for Responsible Fisheries (CCRF). When adopting and implementing these strategies Sri Lanka will be guided by outputs of this meeting. A vote of thanks was provided for the Minister for supporting the Forum and to FAO, the presenters, APFIC Secretary and all heads of departments and organizations that participated.

Mr Simon Funge-Smith, Secretary of APFIC welcomed participants to the Sixth RCFM. He outlined how the RCFM was organized to precede the session of the Commission and was intended to provide a more open discussion and exploration of the issues and priorities in the fishery and aquaculture sectors that are relevant to APFIC member countries and regional organizations. He outlined how the meeting would provide time for participants to work together to reach a consensus on the conclusions and recommendations on Blue Growth that are the final output of the RCFM. He expressed his gratitude to the Secretary, Ministry of Fisheries and Aquatic Resources Development and the FAO Representative to Sri Lanka and Maldives for taking the time to open the Regional Consultative Forum Meeting and for their assistance in making the arrangements for the RCFM. He also thanked the Government of Sri Lanka for its generous hosting arrangements.

On behalf of Ms Kundhavi Kadiresan, Assistant Director-General of the Food and Agriculture Organization of the United Nations' Regional Office for Asia and the Pacific, Ms Nina Brandstrup, FAO Representative to Sri Lanka and Maldives, warmly welcomed everyone to the meeting. She outlined how the RCFM is a biennial stocktaking of the work of the APFIC, its member countries and regional partners. It is therefore relevant to the Commission's programme of work and also provides an open platform to discuss and explore new and emerging ideas and issues related to fisheries and aquaculture. The theme of the meeting, ***"Promoting Blue Growth in fisheries and aquaculture in the Asia-Pacific,"*** reflects the importance that Commission members have given to opportunities to increase the pace of development of sustainable fisheries and responsible aquaculture in the region. She said that for those who may be new to the concept of Blue Growth a broad overview would be provided and that it is important to understand that Blue Growth itself is a relatively new term, but it is really just an umbrella for a number of existing approaches to sustainable and responsible development of the fishery and aquaculture sectors and that at its core is the promotion and implementation of the FAO CCRF. The Forum was also tasked with developing recommendations to be presented to the 34th Session of the Commission for its consideration. She outlined the importance of APFIC as a neutral forum, which strives to forge links between member countries, regional-partner-governmental organizations and relevant non-governmental organizations in order to give voice to the fishery and aquaculture subsectors and those who depend upon it. On behalf of FAO, Ms Brandstrup thanked the hosts, the Government of Sri Lanka and the staff of the Ministry of Fisheries and Aquatic Resources Development who so enthusiastically contributed to the organization and convening of this important meeting.

Regional overview of fisheries and aquaculture

To set the context for the technical discussions, the first session of the RCFM included a review of Blue Growth in inland and marine capture fisheries in the region. The second part of the session reviewed the current status and trends in aquaculture and the importance of Blue Growth in this respect.

Promoting “Blue Growth” in marine and inland capture fisheries

Simon Funge-Smith, Secretary, Asia-Pacific Fishery Commission

Marine and inland capture fisheries make a significant contribution to food and nutrition security and livelihoods of millions in the Asia-Pacific region and beyond. In terms of employment alone there are some 48 million people (87 percent of the global total) engaged in fisheries and aquaculture production with a further 170 million direct and indirect employment opportunities along the value chain from harvesting to distribution in the region and globally. The greatest proportion of the world's fishing fleet is from Asia (73 percent of the world total of 3.23 million vessels). More than 90 percent of the region's capture fishers are small-scale fishers.

The sector has enormous potential (both marine, inland and aquaculture production systems) to contribute to achieving the sustainable development goals in the region. But, to do so it is important ensure that the benefits are sustained so that, the key contributions can be seen in GDP, production, livelihoods, trade (seafood is the most traded commodity in the world), employment and food and nutrition security. The sector can also contribute to gender inclusiveness and poverty alleviation.

However, capture fisheries production has reached a plateau during the last 20 years with an increase in the number of fisheries and stocks over exploited. This has been due to a steady rise in fishing effort, improvement in technology and demand as well as other issues. In addition, fisheries have been impacted by ecosystem changes, increasing pollution and habitat modifications. There remains little scope for expansion of marine capture fisheries. Sustainable management of the regions fisheries will be a significant development challenge in future. A consequence of these impacts is a decline in the profitability of fisheries in the region in general. The situation is not irreversible and recent commitments by a number of countries have shown how effective action can reverse the decline. There is potential to restore fisheries through sustainable management and to return economic advantages to fishers at every scale. Tropical fisheries in particular can recover quickly by comparison.

Some of the key environmental factors affecting the sector include climate change (the impacts of which will affect fisheries already overstressed by poor management), overfishing, pollution, water abstraction and habitat alteration. All of these could lead to a loss of revenue across productive sectors. Other impacts from climate change damage to infrastructure, accelerated coastal and watershed erosion, depletion and/or shifting of fish stocks, bleaching and ultimately death of coral reefs and may result in limited availability of water resources. Although impacts are mostly negative, some opportunities also exist with emerging new fisheries as a result of shifting stocks.

“Blue Growth” approaches emerged from the United Nations Conference on Sustainable Development (Rio+20, 2012), which called for sustaining and building on the potential of aquatic systems to deliver long term economic, environmental and human benefits. They support sustainable development and can help stakeholders to address some of the issues affecting the fisheries and aquaculture sectors. Blue Growth approaches aim to ensure healthy ocean and inland water ecosystems are more productive and economically sustainable and can only be realized if the health and productivity of these systems can be maintained or restored.

The FAO-BGI assists countries to develop and implement blue economies and growth agendas. It builds on the FAO CCRF, adopts the use of ecosystem approaches to planning and fisheries and aquaculture management is climate smart, ensures responsible investment and contributes to the achievements of the Sustainable Development Goals (SDGs). The FAO-BGI aims to deliver *“Sustainable growth and development emanating from economic activities in the oceans, freshwaters, wetlands and coastal zones that minimize environmental degradation, biodiversity loss and unsustainable use of aquatic resources, and maximize economic and social benefits.”*

Blue Growth strategies support more sustainable management of fisheries through the adoption of ecosystem-based approaches with the aim to enable over-fished resources to pull back to more economically viable levels. They can help address environmental impacts by addressing specific issues (such as bycatch) and by improving coastal habitats and protecting critical areas. The FAO-BGI supports countries in addressing IUU fishing, (which is undermining management) through capacity development, strengthening of regional cooperation, implementation of Port State Measures Agreement (PSMA), national Monitoring, Control and Surveillance (MCS), vessel registration and inspections for safety and seaworthiness. FAO-BGI also supports small-scale fisheries and aims to create a space where they can operate (with a focus on rights) by strengthening fisher organizations and helping to link them to markets and trade. It aims to strengthen the rights of fishers.

For inland fisheries it also promotes fishery enhancements and works to secure the interests and rights to management and utilization of fisheries resources, strengthening community-based fisheries management approaches and improving the understanding and agreement of how to fish water bodies sustainably. FAO-BGI helps to improve ecosystem services and enhances fisheries productivity through habitat, environmental restoration/enhancement, connectivity of water bodies and improved natural recruitment. It supports an increase in productivity of man-made water bodies and can help capture the opportunities of integration with aquaculture through stocking to enhance fisheries and innovative integration with agriculture irrigation. FAO-BGI adds value to water by engaging with the water management sector to help them find possible win-win outcomes (such as better watershed management, water quality and maintaining minimum critical flows to sustain fish productivity).

FAO-BGI supports the strengthening of the fisheries value chain and seeks out increased private sector investment and growth (blue investments). It helps to support fishers to meet the demands of markets and regulatory requirements for sector development, including strengthening of marketing organizations, improving market access (through IT, e-documentation, traceability, cold chain assurance and certification and labelling). In particular, it aims to improve the capacity of producers of artisanal fishery products to access higher value markets through organization, improvement of hygiene and quality.

FAO-BGI supports the implementation of FAO's Decent Work Initiatives through safety at sea, and equitable contracts and the Voluntary Guidelines for Securing Small-scale Fisheries and the FAO voluntary guidelines on tenure. It encourages viable, sustainable livelihoods for those engaged in the sector.

In the Asia-Pacific region women play an important role in the sector. It is estimated that, overall, they accounted for more than 19 percent of all people directly engaged in the fisheries and aquaculture primary sector in 2014 and up to 50 percent when both primary and secondary sectors are considered. FAO-BGI supports the role of women by encouraging efficient seafood value chains and improving livelihoods and decent work conditions, especially for women and young people.

A key objective of the FAO-BGI is to develop capacity to drive “Blue Growth” through developing pilot approaches to promote innovations, encourage investment, remove barriers, increase awareness of FAO-BGI potential, reduce risks and invest in knowledge and learning. Training and capacity building

are required for FAO-BGI implementation.

The need and opportunities for Blue Growth in aquaculture in the Asia-Pacific region

David Brown, APFIC Secretariat

A review based on the new *Fishstat* online database from FAO, covering world fisheries and aquaculture up to 2014 was provided. The review described the current status of Aquaculture Production in Asia and the Pacific region from 2000.

Sustainable growth and development emanating from economic activities in the oceans, freshwaters, wetlands and coastal zones, that minimize environmental degradation, biodiversity loss and unsustainable use of aquatic resources, and maximize economic and social benefits.

Aquaculture development is making a significant contribution to food security and livelihoods in the Asian region (88.5 percent of global production). The region produced 62.1 million tonnes of aquaculture products (excluding aquatic plants) in 2013. These had an estimated value of US\$ 115.76 billion (doubling since 2003). Seven of the top 10 producing countries are in the region (quantity and quality). The trends for aquaculture production are for it to continue to increase. Fish consumption continues to rise and it makes up 17 percent of the global population's intake of animal protein providing essential nutrients, vitamins, and omega 3 fatty acids.

Despite this success aquaculture needs to respond to some key challenges in order to continue to make this contribution. Global and regional population growth will result in an increased demand for seafood. Without effective capture fishery management measures to recover these fisheries, this gap in seafood supply will have to be filled by aquaculture. In particular Asian aquaculture will need to develop to meet regional and global demand for fish. Many countries in the region are therefore increasing their investment in aquaculture.

Many aquaculture and culture-based fishery production systems in the region are showing signs of unsustainable development and even declining productivity. The rapid growth in aquaculture and inland culture-based fishery production over the past three decades has largely been due to the expansion of culture areas, technological intensification and the increased use of feed. With the increased economic intensification of aquaculture there is a shift towards species that are high-value and need high protein feed and this presents resource challenges, particularly linkage source of fishmeal. This intensification has also resulted in environmental and disease challenges driven by overcrowding and the limitations of environmental carrying capacity.

A major threat to aquaculture in the region is the impact of climate change. Tropical floodplains, mountainous areas, low-lying small island developing countries and tropical deltas are all vulnerable. Impacts will be excessive rainfall, cyclones, flooding, rising sea levels, storm surges, droughts, reduced water supply and high temperatures. Food quality may also be threatened with the increased risk of species invasions and the spreading of vector-borne diseases. Impacts will also include damage to farm infrastructure, loss of stock and revenue. Although most impacts are generally considered to be negative, there may be some opportunities enabling culture of new species.

The FAO-BGI in aquaculture aims to support countries to achieve a balance between healthy aquatic ecosystems and sustainable growth in production. FAO-BGI in aquaculture is a combination of strategies aimed at policy and institutional reform, on the ground action and implementation of the FAO CCRF through the use of ecosystem approaches to planning and management. FAO-BGI also delivers the SDGs and on national climate change targets and commitments. The goal of "Blue Growth" is to achieve a balance between healthy aquatic ecosystems and sustainable growth in

production.

Blue Growth strengthens aquaculture value chains by empowering producers to meet the demands of markets and the regulatory requirements for sector development, (including meeting national and international quality standards, enhancing market access and strengthening marketing organizations). It increases private sector investment and growth seeking out “blue investments” and building a better understanding of supply and demand. It improves access to markets by harnessing Information Technology (IT) via e-documentation, traceability and cold chain assurance, certification, labelling, and it also improves the capacity of small-scale aquaculture producers to access markets.

Blue Growth supports small-scale producers who sometimes have difficulty accessing technological innovation, which may be expensive, complex, uneconomic and requiring specific infrastructure. High relative economic returns can for example be generated from systems with smaller footprints (omnivorous finfish, mussels and seaweed). These take advantage of natural aeration and reduced water exchange. Such species feed lower in the food chain and need less feed and energy. Biotechnology opportunities include genetic and health improvements like high health, Specific Pathogen Free (SPF) stock and the exploration of new species for culture. Innovations in feed and feeding also include automation and information technology (IT) to improve feeding efficiency and performance of feed, especially for omnivorous and herbivorous species; and, reducing the dependence on fishmeal. Innovations and new products include the use of aquaculture to mitigate carbon emissions, linkages to biofuel production, opportunities for seaweed used for polymers, nutraceuticals and other products beyond food.

The goal of the FAO Regional Blue Growth Initiative (FAO-RBGI) is: *“To contribute to Blue Growth through sustainable intensification of aquaculture and improved management of fisheries, water, land and forestry”* for food and nutrition security, poverty alleviation and socio-economic development in the Asia-Pacific region. The FAO-RBGI’s major areas of work include:

- Identification of options to address key governance constraints to sustainable aquaculture growth
- Increasing farmer adaptability and resilience to climate change and natural disasters
- Reduction of negative environmental and social impacts of aquaculture intensification
- Promotion of innovative farming technologies and management practices
- Improved access to quality production inputs by poor rural aquaculture farmers
- Improved management of forestry (mangrove), water, land and tenure to contribute to sustainable intensification

The FAO-BGI Aquaculture Regional Initiative (ARI) supports six focus countries (Bangladesh, Indonesia, the Philippines, Sri Lanka, Timor-Leste, and Viet Nam) through four full FAO Technical Cooperation Programme (TCP), five FAO Technical Cooperation Programme Facility (TCPF) projects, two Government Cooperation Programme (GCP) projects and one multi-donor fund supported project. At a regional level, the ARI is supported by a regional TCP (aquaculture management) for selected Association of Southeast Asian Nations (ASEAN) members and an innovative meeting on rice-fish farming in Asia-Pacific has been convened along with training on small-scale aquaponics.

Achieving Blue Growth in fisheries

APFIC regional overview of IUU fishing by foreign fishing vessels in marine fisheries in Asia

Simon Funge-Smith, APFIC Secretariat

IUU fishing remains a pervasive problem in the Asia subregion. Its clandestine and illegal nature makes IUU fishing difficult to detect and deter. It also remains a challenge to derive adequate regional characterizations and estimates of volumes and values of IUU fishing activities. The review attempted to quantify and characterize IUU fishing activity in the Asia subregion by foreign fishing vessels, or vessels that have foreign beneficial ownership. This review focused primarily on the illegal and unregulated components of IUU with less attention paid to the matter of catch documentation and reporting. The various types of IUU fishing activities, which form the basis for identifying IUU hotspots, are largely comprised of illegal or unregulated fishing activities.

It is important to note that many countries are currently taking increasingly affirmative action to combat IUU fishing and it is certainly the case that progress is already being made in combatting some of the activity presented in this review.

IUU fishing hotspots are found across the subregion of Asia with almost every country having some sort of IUU fishing issues with foreign or foreign beneficially owned vessels. The type of illegal activity identified is typically a mixture of several inter-related issues. This means that effectively combatting IUU fishing will require a combination of actions. The species that are being targeted are generally not those that are managed under Regional Fisheries Management Organization agreements, (e.g. the Indian Ocean Tuna Commission and the Western and Central Pacific Fisheries Commission) or subject to any regional fishery management plans.

IUU fishing is more probable when the following circumstances are met, either individually or, more typically, in combination. This means that a risk-based approach can be used to target areas that are likely to be prone to IUU fishing activity. Such areas have the following typical characteristics:

- Relatively good fishery resources are in the hotspot that make the illegal act worthwhile (in other words the illegal benefit outweighs the calculated risk);
- Subject to limited MCS presence and therefore lower risk of being caught;
- Involve corrupt practices that facilitate circumventing the law by turning a blind eye, or by passing on strategic patrol vessel or aircraft information to illegal fishing vessels; and,
- Areas are at relatively long distance from the location of MCS assets.

The results of the overview indicate that the total tonnage and value of the estimated IUU fish catch in the regional IUU fishing hotspots is somewhere between 2 034 257 tonnes to 2 467 284 tonnes, worth an estimated US\$ 3.06 billion to US\$ 5.24 billion. This represents between 2.3 percent and 10.4 percent of the total reported catch for the areas covered.

The scale of the IUU fishing is variable, with 81 percent to 82 percent of the total volume of IUU fish (1 734 548 tonnes to 2 093 672 tonnes) being caught in just six areas, which also represent the highest values (78 percent to 79 percent of total value) totalling US\$ 2.4 billion to US\$ 4.15 billion. All of these high-volume fisheries are trawl fisheries or a mixture of trawl and purse seine fisheries. The next 11 percent of the total volume (224 209 tonnes to 264 329 tonnes) is caught in a further six areas with a total value of US\$ 4.82 billion to US\$ 8.36 billion (16 percent of total value). These hotspots also comprise trawl fisheries with some purse seining, one example of tuna gillnetting and one of tuna longlining. The remaining 21 of the IUU fishing areas identified accounted for just 4 percent of the

tonnage (75 500 tonnes to 109 283 tonnes) and 5 percent of the total value (US\$ 1.81 billion to US\$ 2.53 billion).

The Gulf of Oman, Pakistan-West India, Western Arabian Sea and coastal waters of Somalia, Maldives exclusive economic zone (EEZ) and British Indian Ocean Territory (BIOT): The estimate for these areas is highly influenced by the IUU fish catch from the fisheries between Pakistan and Iran. Although there may be more widely publicized issues of encroachment between India and Pakistan, the volume of catch appears relatively modest. The overall IUU fish catch estimated represents about 2.3 to 2.6 percent of the reported total catch of the countries concerned.

Bay of Bengal, Malacca Strait: The total IUU fish catch volume for this area (Figure 4, Table 20) is dominated by the catch in the southern Myanmar EEZ area. However, in terms of value, the Palk Bay fishery is slightly higher. This reflects higher estimates of value in the reports. The volume of the IUU catch of tuna is much lower, but because of the high price, is also a significant contributor to the overall value. This IUU catch is 10.4 percent to 10.9 percent of the total estimated production of the Bay of Bengal and represents the upper end of a global estimate by Agnew *et al.* (2009).

South China Sea and Gulf of Thailand: The total IUU catch volume in this area is dominated by the IUU catch of the Natuna Sea (approximately 67 percent to 78 percent of the total). There are still significant catches elsewhere around the South China Sea. The majority of this catch is by trawl and purse seine vessels. This IUU catch is 6.9 percent to 9.3 percent of total estimated production of the South China Sea.

Arafura-Timor Sea, Banda Sea, Savu Sea: The total IUU catch volume in this area is dominated by the IUU catch of the Arafura Sea, Indonesian EEZ (approximately 85 percent to 86 percent of the total). The IUU catches in other areas are far lower, representing the small EEZ area of Timor-Leste and Papua New Guinea "Dog Leg". These are both predominantly trawl fisheries.

Sulu-Celebes, Sulawesi Sea, Makassar Strait, Molucca Sea, Halmaheras Strait: The volume of IUU catch in this area is quite small and relates mainly to tuna catches, although there are associated species catches reported as well. This may reflect limited information on the scale of IUU fishing by foreign vessels and limited MCS coverage. However, more probable is that domestic vessels conduct the majority of IUU fishing in this area. A study by Tsemenyi and Palma (2008) that included this area, found higher values and that the majority of IUU catch was related to reef fish and corals as opposed to tuna. The geographical extent of this area is also relatively small compared with the other areas covered in this review.

East China Sea and Yellow Sea: The total IUU catch volume in this area is dominated by IUU catch in the eastern part of the Yellow Sea. The IUU catch estimate for this case example is based on a single published report. The other IUU fishing issues focus principally on endangered, threatened and protected (ETP) species.

Characterization by type of IUU fishing activity

The IUU fishing case examples which were identified were characterized according to six common categories: encroachment; absence of authentic documentation; non-compliance with technical measures; illegal trans-shipment; illegal species; degree of premeditation.

Overall, 54 percent of the IUU fishing hotspot case examples demonstrated five or six of the IUU fishing characteristics and 36 percent of the case examples demonstrated three or four of the characteristics. Only 3 percent of the case examples demonstrated one or two of the characteristics. This is unsurprising as hotspots with few IUU fishing issues are unlikely to attract much attention in the media or in fishery management circles.

The use of this characterization approach, linked to a scoring method could be used to undertake a screening process for identifying and prioritizing IUU fishing hotspots at the national level, as part of a comprehensive national plan to combat IUU fishing.

Characterization of IUU fishing by type of target catch

The IUU fishing hotspots identified can be clustered into four key types, and this can enable some common characteristics to be identified. Since financial reward is the primary driver of most IUU fishing conducted by foreign vessels or vessels with beneficial ownership outside of a country, it is typical that most of the IUU fishing hotspots are linked to either high volume or high unit value catches.

The majority of the volume and value of IUU fish caught in the subregion can be clustered under a high volume, low value catch category. This category therefore would be the highest priority focus for combatting IUU fishing across the subregion. It is worth noting that a significant part of the advocacy for combatting IUU fishing in the Asian subregion is directed at IUU fishing that is having a disproportionate impact on sensitive biodiversity and ETP species, even though the volume and aggregated value may be quite low. This is a challenge. Combatting this form of IUU fishing with traditional MCS patrolling mechanisms is expensive and ultimately inefficient unless highly focused on known hotspots.

The low-volume, low-value catch is typified by traditional or small-scale IUU transboundary fishing and this represents a tiny fraction of the total IUU fish catch, even if the number of vessels involved may appear considerable.

Drivers and factors predisposing to IUU fishing

The review explores the drivers and factors that allow IUU fishing to occur or persist. In almost all cases the activity takes place close to maritime boundaries, in locations that are remote from surveillance. Large-scale vessels or small-scale vessels may undertake IUU fishing, but it is notable that the majority of volume and value of IUU catch is by the large-scale vessels. The principal factors that predispose to IUU fishing activity were identified as:

- Outdated legal frameworks;
- Ineffective vessel registries and related controls;
- Official tolerance of IUU fishing;
- Limited monitoring, control and surveillance (MCS) capacity;
- Weak vessel tracking and monitoring;
- Economics;
- Institutionalized tolerance of IUU fishing to maintain raw material supply;
- Corruption;
- Inadequate port and service infrastructure in countries providing access to fisheries; and
- Declining tolerance of transboundary straying.

Governance-related drivers

Out-dated legal frameworks: The fishery legal frameworks in many countries have not kept up-to-date with the rapid evolution of fisheries, in particular, with the technological aspects, or the emergence of long distance and transboundary fishing in the subregion. Judicial processes that would normally support effective sanctions and action against IUU fishing remain weak and in most cases address purely domestic IUU fishing. In-port and at-sea inspection, collection and recording of forensic

evidence of the illegal fishing act is also a challenge for many fisheries administrations and should be a focus of capacity building.

Ineffective vessel registries and related controls: The rapid increase in fishing vessels capable of operating over increasingly long distances has meant that many Flag States are incapable of exerting adequate controls over their fleets. Large parts of the artisanal fleets are unregistered and many states cannot say with a high degree of accuracy the exact number of vessels that are actively fishing. Vessel registration systems may be weak, with many registries incomplete or not updated. Registries are not integrated with the system of fishing licenses because the responsibilities for registration and licensing are often within different ministries.

Absence of authentic documentation: This is strongly linked to encroachment, as vessels fishing in foreign countries often do so without permission. This occurs in combination with forged documentation, dual flagging, fraudulent vessel licenses and registrations, obscured or false vessel markings. This is a particular problem with dual flagged vessels as it allows both flag countries to avoid responsibility for the vessel. The incidence of dual flagging in several countries in the subregion can be attributed to lack of adequate vessel registries, or the lack of knowledge or willingness of coastal state authorities to ensure that vessels are duly deregistered from the old Flag State before registration with the new Flag State. There are also situations where fishing licenses may be granted by local authorities to fishing vessels in contravention of national policies related to foreign fishing vessels or vessels with foreign beneficial owners.

Corruption: In general, tackling corruption has never been explicitly a part of classical MCS. Vessels that are at sea may bribe MCS officials to let them go. Rent seeking behaviour in ports and at sea by MCS units may result in unofficial payments (or requests for fuel in lieu of payment) demanded to avoid false prosecution.

Limited MCS capacity: IUU fishing tends to occur in areas where there is little surveillance, particularly in areas distant from major ports and populated areas where detection is easier. MCS assets and resources must be located and prioritized according to where they are likely to have the greatest effect. The best way to determine this is by using risk-based assessment to determine the type, location and frequency for the deployment of MCS assets and for allocating adequate human and financial resources. The use of Vessel Monitoring System (VMS) in the subregion is almost exclusively applied to very large vessels. In addition, VMS that have been installed may be privately operated rather than integrated into a national MCS framework. An effective legal framework is essential for VMS to be a successful tool. In some countries with VMS, the data is still not admissible as evidence in a court of law.

Tolerance of IUU fishing because of limited legal powers or reciprocal agreements for return of fishers: There has been an historically high level of tolerance of IUU fishing by national vessels and by small-scale foreign vessels within the subregion. Partly because of a desire among countries to maintain cordial relations with their neighbours, this approach is most commonly seen in the case of transboundary encroachment of small-scale fishing vessels. The declining tolerance for transgressing EEZ boundaries is being accompanied by more stringent regulations and policies for access to a coastal state's EEZ.

Economic drivers

Low profitability or economic opportunity: Many fisheries in the subregion have been classified as either overfished or fished to their limits. Subsidies in the fishing sector sustain uneconomic fishing, but may incentivize IUU fishing and keep older vessels in service. The profitability of fishing may be achieved or increased by avoiding landing fees and taxes through trans-shipment and non-entry to

port. Abusive crew employment conditions, forced labour and even slavery can and does occur under these conditions. Countries should evaluate the economic losses resulting from IUU fishing and also the impact of direct and indirect subsidies.

Trans-shipment: Trans-shipment is part of a particular *modus operandi* of IUU fishing. Smaller vessels, which may fish legally or illegally, consolidate their catches onto a carrier vessel to ship back to their owner's country. This is done to avoid payment of landing fees, to save on fuel and transportation costs or to access higher value markets. It may not be illegal to trans-ship catches of domestic fishing vessels according to the existing laws and fisheries management agencies should consider including trans-shipment more clearly in the fishery regulations.

Inadequate port and service infrastructure in countries providing access to fisheries: Many of the richer fishing grounds lie at the extremities of the coastal states' EEZ waters and are usually remote or far from conventional ports. In this case little or no infrastructure is available. Fishing operations and landing and handling of fish in these remote conditions present additional costs and often the long distances compromise the quality of the fish and fishery products. In order to reduce these losses, some fishing ventures have resorted to at-sea trans-shipments back to other more developed port areas that invariably lie outside of the country that has granted fishing access. Improving port infrastructure and management may deter trans-shipment.

ETP species: The degree to which ETP species are targeted varies across the hotspots and even in situations where ETP species were not being targeted they were still identified as an incidental issue. ETP species catch is often a bonus for a crew on an otherwise legal fishing boat. In a number of cases, in addition to illegal vessels targeting the ETP species, vessels might have recruited poor local artisanal fishers to fish ETP species. Trans-shipment is clearly a major issue with ETP species as the volumes of ETP species found on board IUU fishing vessels were beyond the catching capacity for a single fishing vessel. Port inspections (on national vessels returning from fishing and trading overseas) are going to be most effective in deterring this trade since the risk of capture at sea seems rather low.

Conclusions and recommendations

The review has been developed based on the issues of IUU fishing that are related to foreign fishing vessels and those domestic vessels that have a high probability of foreign involvement in the operations or benefits of the fishing operation (e.g. joint ventures, beneficial ownership or foreign landings and trans-shipment). This focus on foreign-related IUU fishing is intentional as it also provides a good basis for exploring potential regional or subregional solutions that go beyond simply strengthening domestic fishery management. The recommended actions to address identified IUU fishing problems are typically going to be a combination of governance and economic management measures as follows:

- Identify, quantify and prioritize IUU fishing hotspots.
- Undertake reform of fishery laws.
- Improve coordination and transparency related to vessel registration and reflagging.
- Strengthen MCS capacity using risk based-systems.
- Apply VMS effectively.
- Establish or strengthen port inspections and monitoring.
- Improve catch documentation systems.
- Improve bilateral (trilateral) cooperation.
- Strengthen subregional cooperation.

- Improve communication on IUU fishing with fishers and raise their awareness of the issues.
- Improve port infrastructure and operations.

The context-specific nature of IUU fishing also means that the degree to which it is tolerated, or requires that action be taken to address it, will vary considerably. In particular, IUU fishing that is not systematic and that has relatively limited impact could be deprioritized in favour of addressing the high volume, systematic IUU operations that have been identified in the subregion.

The review provides recommendations on the use of risk assessment and risk-based approaches to identifying IUU fishing hotspots and for use in prioritizing monitoring, control and surveillance actions. Key strategies to resolve IUU fishing in almost every case requires strengthening of vessel registries and vessel tracking, together with establishment of effective port controls on domestic and foreign vessels.

It is worth noting that these recommendations correspond quite closely to the list of recommended elements that should be covered when developing a national plan of action to deter, prevent and eliminate IUU fishing (NPOA-IUU). The development of an NPOA-IUU is a significant step in demonstrating this commitment and for gaining political and institutional support. Importantly, an NPOA-IUU should not be viewed as a paper exercise, but part of a fishery management reform process. This is a process whereby a country can:

- Identify IUU fishing issues, the prevalence and scale of IUU fishing, its costs and impacts;
- Identify weaknesses in legal and institutional frameworks and how these may be strengthened;
- Establish the basis for interagency coordination (especially for port controls, MCS, vessel registration and the judicial process); and
- Develop actions to address identified issues over the short, medium and long term.

Improving fisheries management and reduction of ecosystem impacts in Malaysia

Hemalatha Raja Sekaran, Malaysia

Malaysia has been implementing various programmes and activities, aimed at improving fisheries management as well as reducing ecosystem impacts to ensure sustainability. One of the important initiatives includes implementation of EAFM in five Malaysian states, namely Sabah, Sarawak, Perak, Selangor and Kedah. Besides establishing pilot sites, Malaysia also continues to provide training and awareness on EAFM to the stakeholders. With regards to international commitment, Malaysia has formulated several National Plans of Action (NPOAs), i.e. NPOA for Management of Fishing Capacity in Malaysia, NPOA for the Conservation and Management of Sharks, and NPOA to Prevent, Deter, and Eliminate IUU Fishing, which are implemented to ensure proper management of fisheries resources. In combating IUU fishing, Malaysia actively cooperates at regional and international levels through information sharing, in particular under the IUU Regional Plan of Action. Moreover, Malaysia also provides capacity building pertaining to PSM and participates in training sessions provided by other international organizations to make sure it is prepared to properly implement PSM. As Malaysia exports fish and fishery products to the EU, implementation of the European Commission's catch certificate Regulation 1005/2008 has been instrumental in ensuring the smooth flow of trade.

Increasing the productivity of man-made water bodies

Thay Somony, Cambodia —The following abstract was taken from the Cambodian Fisheries Administration's Strategic Planning Framework for Fisheries in Cambodia (2015–2024).

The fisheries sector is one of the most important sectors affecting the lives and livelihoods of people in Cambodia. In order to maximise and ensure the sustainability of the contribution of the fisheries sector to national development the SPF for Fisheries 2010–2019 was developed.

As with any fishery, the outside forces that affect the sector have changed over time and the national government policy framework has evolved to accommodate wider forces affecting the country, the economy and people. The Rectangular Strategy Phase III and National Strategic Development Plan (NSDP) 2014–2018 define the new over-arching structure for development within which the SPF fits and the SPF provides the longer-term fisheries context to guide the development of the sector. This SPF update (Volume 4 of the SPF) incorporates the deep policy reforms of the sector, which have occurred, releasing a further 80 fishing lots to small-scale fisheries and conservation areas. These changes, along with those associated with wider climatic changes, expansion of hydropower, changing international obligations and increasing emphasis on the rights of women, the young and the poor in the development process, need to be accommodated by changes to the SPF in order to make it fit for purpose in coming years. This update of the SPF places those changes in context and provides a framework for the development of the sector over the next 10 years.

The SPF starts with an outline of fisheries in Cambodia and how it has developed over the last five years since the SPF 2010–2019 was written. It then reviews the potential of the sector and the challenges that it faces. The third section lays down the fisheries sector strategic approach for the coming ten years. This is based on the vision for the sector, the wider policy framework in which fisheries and the areas of strategic focus for the sector are outlined. The key elements of the strategic approach according to four development pillars for the sector are:

- 1) Capture fisheries¹ and management;
- 2) Aquaculture: inland and marine;
- 3) Fisheries value chain; and
- 4) Regulatory and services.

The fourth section outlines how the strategy will be carried out and provides principles for implementation.

¹ Fisheries include not only fish, but also a wide diversity of other aquatic animals (OAA) and plants that are used by the population for food, trade and inputs to other activities. OAAs make up a considerable percentage of the wild fisheries capture production and also have the potential for aquaculture development. Further, the Cambodia Law on Fisheries, Chapter 1, Article 2 states: "This law extends the implementation to all fisheries whether it be natural, artificial and aquaculture." Thus the term "Fisheries" is considered inclusive of aquaculture.

Marine ecosystem health and human well-being (The North Pacific Marine Science Organisation Marine Ecosystem Health and Human Well Being (PICES–MARWEB) project in Indonesia) – *A good relationship between local communities and seafood diversity*

Masahito Hirota², Mark L. Wells³ and Mitsutaku Makino²

Shrimp pond cultures have been widely developed since the 1980s in Southeast Asian countries. But after the 2000s, shrimp farming was largely abandoned due to mass diseases that threatened the livelihood of the local inhabitants, giving rise to social instability at the local community level. To consider how to rectify this condition, the PICES S-HD is studying the use of an environmentally friendly aquaculture technology, while applying a social science approach by working together with the local community.

In Indonesia (Java Island), the work plan has been carried out with two approaches; the first one is an integrated pond culture experiment known as Integrated Multi-Tropic Aquaculture (IMTA), which is a method of polyculture in which fish, scallop and seaweed are managed together so that the by-products from one species are used as food or fertilizer for another.

Another approach is based on social science, using a commodity chain analysis of the products, to assess what kind of businesses can support people in local communities, who consumes the different species produced (shrimps, milkfish, crab, etc.) to ensure a rich variety of seafood as ingredients for everyday life and to create diverse new jobs in the community.

To understand this sustainable approach, the PICES has held three international workshops in Indonesia and we have successfully raised the awareness of the general public about seafood sustainability. For the future, it is expected that many communities will establish and lead local IMTA programmes in order to improve their own well-being.

This research is a part of a five-year project on “Marine Ecosystem Health and Human Well-Being” (PICES-MarWeB) supported by the Ministry of Agriculture, Forestry and Fisheries (MAFF) of Japan (<https://pices.int/projects/MarWeB.aspx>). We think that it will lead to the next step along with the concept of Blue Growth.

Overview of three major United States “Blue Growth” initiatives in 2015

Michael Abbey, USA

United States’ efforts in 2015 to promote Blue Growth through the promotion of domestic aquaculture and mitigating IUU and seafood fraud

The United States of America had several high profile fisheries successes in 2015. There has been high-level emphasis on addressing IUU fishing and seafood fraud from the White House with the establishment of a Presidential Task Force in 2014 that developed various recommendations to integrate US federal government agencies to coordinate and collaborate with one another to combat the issue comprehensively. The Task Force published an Action Plan in 2015 that details implementation of its recommendations. In the domestic aquaculture news, the National Oceanic and Atmospheric Administration (NOAA) published a final rule implementing the USA’s first regional regulatory programme for offshore aquaculture in federal waters. In doing so, NOAA is expanding opportunities for US seafood farming in the open ocean.

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Presidential initiative on IUU fishing and seafood fraud

As a global leader in sustainable seafood as well as an importer of up to 90 percent of its seafood for domestic consumption, it is in the interest of the United States to promote and support sustainable fishing practices while at the same time combating and preventing illegally harvested or fraudulently marketed fish from entering the global stream of commerce.

As noted above, the Task Force was directed to report to the President with “recommendations for the implementation of a comprehensive framework of integrated programmes to combat IUU fishing and seafood fraud that emphasizes areas of greatest need.” Through an extensive public comment and engagement process with stakeholders, including international partners, the Task Force developed 15 recommendations, which were released in December 2014 for further comment. Based on this final round of public comments, the Task Force published an Action Plan in March 2015, which articulates the aggressive steps that federal agencies will take both domestically and internationally to implement the recommendations. The National Ocean Council’s (NOC) Committee (NOCC) on IUU Fishing and Seafood Fraud was established to take the place of the Presidential Task Force and oversee implementation of the Action Plan.

The Plan details steps to implement recommendations to strengthen enforcement and enhance enforcement and other MCS tools and create and expand partnerships with non-US government federal entities to identify and eliminate seafood fraud and the sale of IUU seafood products in US commerce. It highlights steps to enhance addressing IUU fishing and seafood internationally, including working with our foreign partners to strengthen international and regional governance, enhance cooperation, and build needed capacity. Further, the Action Plan details steps to develop a traceability programme, which will track domestic and imported seafood products from harvest or production to the point of entry into US commerce. This programme will be phased in by species with significant risk of IUU fishing in the global supply chain and aims to help prevent entry of illegal seafood products in US commerce.

A proposed rule of the US traceability programme was recently published for a 60-day public comment period. It applies to an initial set of species determined to be of particular priority after a public comment and engagement process in 2014. The United States welcomes comments on the proposed rule. Information on the process of developing the traceability programme as well as a link to the proposed rule can be found on the NOC Committee web portal: <http://www.iuufishing.noaa.gov/>.

Aquaculture

While US aquaculture currently accounts for 20 percent of the value of domestic fishery landings, US production still lags behind much of the world despite representing a significant opportunity for coastal communities and domestic seafood production capacity. Marine aquaculture creates jobs, supports resilient working waterfronts and coastal communities and provides international trade opportunities.

NOAA is expanding opportunities for US seafood farming in the open ocean. NOAA and our partners are working to advance and expand US aquaculture, as a complement to wild harvests, to keep US fisheries sustainable and resilient to growing demand. A recently published rule took into account thousands of public comments and authorizes NOAA Fisheries to issue permits for an initial period of 10 years for growing species such as Red Drum, Cobia, and Almaco Jack in federal waters in the Gulf of Mexico.

Marine mammals

The Marine Mammal Protection Act of the United States prohibits, with certain exceptions, the “take” of marine mammals in US waters and by US citizens on the high seas, and the importation of marine mammals and marine mammal products into the US.

NOAA recently issued a rule that will require US trading partners to take measures to limit their bycatch of marine mammals, ensuring that those fisheries support a healthy and diverse marine ecosystem. Under the proposed rule, nations exporting fish and fish products to the United States would be required to demonstrate that marine mammal bycatch in their export fisheries do not exceed levels comparable to US standards. These proposed regulations would establish conditions for evaluating a harvesting nation’s regulatory programme for reducing marine mammal incidental mortality and serious injury in fisheries that export fish and fish products to the United States.

Under this rule, harvesting nations must apply for and receive a comparability finding for each fishery identified by NOAA Fisheries in the *List of Foreign Fisheries* in order to import fish and fish products into the United States. The rule establishes procedures that a harvesting nation must follow, and conditions to meet, to receive a comparability finding for a fishery. The proposed rule provides a five-year grace period during which foreign nations will be able to gather information about the impacts of their fisheries on marine mammals and work to ensure that these impacts do not exceed US standards. Nations not in compliance following this period face possible US import restrictions on fish and fish-related products from the fisheries that fail to receive a comparability finding.

Examples of Blue Growth approaches in culture-based fisheries and aquaculture

Nimal Chandraratne, Sri Lanka

Sri Lanka is rich in freshwater and brackish water resources required for development of inland fisheries and aquaculture. Culture-based fisheries in perennial and seasonal reservoirs have become a major aquaculture activity in Sri Lanka. There are around 45 000 fishers involved in this activity at present. As a result of the implementation of reservoir stocking programmes and the introduction of fisheries management through community participation, inland fish production steadily increased during last two decades. The total annual production in inland fisheries in 2014 increased to 75 750 metric tonnes (mt).

The expansion of culture-based fisheries in Sri Lanka will be carried out through the development of culture-based fisheries in lagoons; development of culture based fisheries in Villages; establishment of barricades to prevent fish loss and to ensure fish-seed containment during floods. Reservoirs and fish restocking in tanks will also be carried out.

Total estimated national fish seed requirement that will be needed to carry out re-stockings in perennial water bodies, seasonal tanks and ponds is about 160 million seeds per year. However, current total fish seed production that comes both from public sector and private sector hatcheries is only about 56 million per year. In an attempt to overcome seed deficits, government policy focused on community-based seed production schemes that will produce advance fingerlings. The lack of proper genetic improvement programmes for quality broodstock is a major issue. To overcome this issue on fish genetics and broodstock management, BMPs and guidelines were formulated and a separate genetic improvement programme was carried out.

Brackish water shrimp farming has been the most lucrative commercial aquaculture activity in Sri Lanka since it started in the mid-1980s. The shrimp industry in North Western Provinces (NWP) was severely affected by the outbreak of diseases in 2004. After implementing several activities, shrimp production of NWP has been sustained at the level of 5 000 mt per annum at present. Expansion of

shrimp farming into Batticaloa District also commenced. Production in 2015 was around 6 500 mt in both Puttalam and Batticaloa Districts combined. To promote and expand shrimp and coastal aquaculture, a marine finfish hatchery and aquaculture industrial parks have been developed and are well established in Batticaloa and Mannar Districts. A Draft national action plan was prepared to prevent EMS disease entering Sri Lanka. At policy level, a strategic plan has been prepared for aquaculture value chain development. A master plan for development of aquaculture in general is planned.

Precautionary approach to sustainable growth of marine fisheries resources in the Bay of Bengal: Bangladesh perspective

Mr Nasiruddin Md Humayun, Bangladesh

Bangladesh established its legitimate right to 118 813 square kilometres (sq km) of the Bay of Bengal, resolving disputes over the maritime boundary with India in 2014 and Myanmar in 2012. The disputes were settled in the International Tribunal on the Law of the Sea (ITLOS) and the International Court of Arbitration. The verdict ensures the sovereign right to explore, exploit and manage living and non-living resources in the EEZ and ABNJ. Bangladesh is a pilot country for the FAO-BGI, which is also a priority area for the Government of Bangladesh (to strengthen its Blue Economy). Pragmatic initiatives, especially conservation-based measures are being implemented to harness maximum sustainable yield of the fishery. Currently, the industrial fishing fleet is comprised of 246 trawlers of varied capacity and types, mostly involved in fishing operations at a depth of 100 m. In addition, about 32 000 mechanized boats are involved in fishing in the coastal and offshore waters within the EEZ. Both industrial and small-scale fisheries ventures should comply with relevant National Fisheries Acts and Regulations.

To ensure the Sustainability of Bangladesh's Marine Fisheries several activities are being implemented (adopting a precautionary approach). These include:

- Preparation of the draft of the National Marine Fisheries Policy and consultation with 28 pertinent maritime agencies;
- Conversion of existing bottom trawlers to eco-friendly mid-water ones;
- Moratorium on new trawlers for fishing below 200 m depth;
- Ban of replacement of trawlers in lieu of older one to restrict overcapacity;
- Promotion of fishing in distant and deep waters beyond 200 m and ABNJ through introduction of long lining;
- Exploring new fishing methods and areas;
- Establishing marine reserves, sanctuaries and marine protected areas;
- Strengthened comprehensive effort to bring all mechanized fishing boats under licensing scheme;
- Declared season closure, banning all types of fishing by industrial trawler for 80 days;
- Initiated a programme to eliminate all types of destructive fishing gear like-estuarine set bag net, stake net, small meshed gill net etc. from marine and coastal waters to restore biodiversity and enhanced growth;
- Strengthened surveillance by Bangladesh Navy and Coast Guard to thwart IUU fishing both by foreign and national vessels.
- Exploratory fishing for large pelagic species from deeper water (more than 200 m in depth) and introduction of long lining to the existing fleet under process.
- Bangladesh has become a Co-operating Non-Contracting Party of the Indian Ocean Tuna Commission (IOTC).

In order to ensure sustainable growth by exploring the potential of the renewable fisheries resources from the sea, regional cooperation on precautionary management tools have been developed:

- Incentive-Based Hilsa Fishery Management in Bangladesh: An Initiative to Blue Growth
- Precautionary Approach to Sustainable growth of Marine Fisheries Resources in the Bay of Bengal: Bangladesh Perspective

Developing an implementation strategy for fisheries and aquaculture management and development in the Lao People's Democratic Republic (Lao PDR)

Bounthanom Chamsinh, Lao PDR

Fish and other forms of aquatic life are extremely important sources of protein in the diet of Lao people. More than 40 percent of the animal protein consumed in the Lao diet comes from fish and other aquatic animals such as frogs, crabs and snails. In 2013, the Government of Laos (GOL) started a project with support from FAO to enable national and provincial authorities to work together more effectively to help secure these resources for the future. The project is led by the Department of Livestock and Fisheries (DLF) of the Ministry of Agriculture and Forestry (MAF) and represents the most recent step in a long-term partnership with FAO to develop aquaculture and fisheries management in Lao PDR, which now spans more than two decades.

The latest phase of this partnership improves the implementation of government fisheries and aquaculture strategies at provincial level. To sustainability strengthen the fisheries sector, it is critical that adequate capacity exists at all levels to interpret and apply government policies and strategies. In line with the government policy on decentralization and strengthening of local level institutions (Sam Sang 3-Builds policy), the project has built up the capacity of national level and provincial DLF staff to interpret and implement government policies and strategies for the sector.

The DLF/FAO partnership to develop an Implementation Strategy for Capture Fisheries and Aquaculture Management and Development in Lao PDR organized a series of structured consultation meetings with stakeholders at central and local levels. These included DLF representatives from 18 provinces as well as representatives from key departments in the Ministry of Agriculture and Forestry, the Ministry of Natural Resources and Environment, and the Ministry of Energy and Mines. The consultation reviewed work currently being undertaken throughout the country in the aquatic resources sector and participants discussed ways in which current government policies, strategies and targets could be implemented. The consultation identified ways in which collaboration between different government agencies and other stakeholders could be improved, particularly in relation to the management and development of reservoirs, which was an important topic in these discussions, including irrigation and hydropower. The document is now a 'Handbook' containing guidelines, advice and other relevant information, which targets mainly DLF provincial staff and aims to help them turn government strategy to practical local action. Key guidance included in the SIP aims to improve provincial planning, the sustainability of aquatic resources management and developing interventions, which more effectively address food and nutrition security and also food safety.

Strategies to attract private sector investment in aquaculture for self-sufficiency in Nepal

Mr Rama Nanda Mishra, Programme Director, Directorate of Fisheries Development, Nepal

Aquaculture in Nepal is rapidly growing. The growth rate of the aquaculture sector in Nepal was 6.95 percent before the "Fish Mission Programme" (FMP) was launched. The programme has helped the sector to achieve an average growth rate of 8.5 percent over the last seven years. However, there is an increasing trend of import with a volume of nearly 12 000 mt valued at nearly US\$ 15 million.

Capture fisheries is under constant threat and maintaining current production levels is a great challenge. Therefore, the increased demand for fish has to be obtained by increasing aquaculture production. The contribution of aquaculture to total fish production in the country is increasing day by day and has reached 69 percent. Still, per capita availability is only 2.5 kg. Nepal is aiming to increase per capita consumption to 10 kg in next fifteen years through vertical as well as horizontal expansion of aquaculture. Horizontal expansion aims to support construction of new aquaculture facilities and reclaiming some of the available but unused water bodies and vertical expansion is aimed at species diversification and intensification through mechanization.

The annual growth rate necessary to achieve the set target is more than 16 percent. There is a potential to accelerate growth, which has been proven by the FMP. The FMP has shown that increased government investment has attracted private sector investment resulting in increased growth. Better policies, investment environment, increased government involvement through technical and financial assistance and support are believed to have helped in achieving the set target.

Nepal has just launched the “Agriculture development strategy” for the next 20 years. The strategy aims to increase land and labour productivity along with competitive and commercial production. The recent strategy is to attract private sector investment to make agriculture production competitive. Soft loan for farmers at a subsidized interest rate of 4 percent, attractive insurance policies and a 75 percent subsidy on insurance premiums are just some of the proactive government policies.

Some of the strategies that the government has developed to attract private sector investment are:

- Soft loans: farmers need to pay only 5 to 6 percent interest as a 4 percent interest subsidy is provided by government.
- Favourable and subsidized insurance policies: Aquaculture insurance is considered to be the best among agriculture commodities as fish farmers pay only 2 percent of the cost compared to 5 percent for all other agricultural commodities, which receive only a 75 percent subsidy covered by the government. Another highlight of fish insurance policies is that farmers can choose whether they want insurance coverage based on production cost, or product value. In addition the aquaculture facilities can also be insured with an additional 1 percent premium.
- Support for aquaculture facility development: There is a 25 to 50 percent subsidy on construction of new aquaculture facilities, including pond construction, raceway construction, hatchery establishment, nursery establishment etc. However, it should be within the stipulated budgetary allocation.
- Subsidies on machinery: A 50 percent subsidy is provided on machines specified for aquaculture development.
- Special packages for species diversification (hatchery establishment and demonstrations).
- Special programme package for hills and mountains.
- Regional balance through project support.
- Customs and tax relaxations on aquaculture tools and equipment.
- An improved seed and feed supply system is being developed.

These strategies are working efficiently and have attracted new entrepreneurs from various walks of life. The impact is also quite satisfactory. US\$ 5 million in subsidies have not only insured annual additional national income of more than US\$ 60 million, but also has attracted some US\$ 30 million last year from the private sector. This year, the initial trend shows still better performance. Therefore, the current strategies and support programme needs to be continued to address the issues of nutrition security, trade deficits, regional imbalances, increased land and labour productivity and income and better livelihoods. Continuing the current strategies and support programmes will also help to meet national targets and sustainable aquaculture development in Nepal.

Status of Blue Growth in fisheries and aquaculture in Pakistan with special emphasis on reduced dependence on imported fish products and improved contributions of domestic fisheries products to healthy diets

Mr Maratab Ali, Assistant Fisheries Development Commissioner-II, Ministry of Ports and Shipping, Government of Pakistan, Islamabad, Pakistan

Fisheries play an important role in the national economy as it not only employs about 1 million people in coastal areas and along the banks of large rivers, dams, reservoirs and other water bodies, but also it is an important source of foreign exchange for the country. One of the important contributions of the country's fishery sector is to provide high quality protein to a malnourished nation. Fish is also a staple of diets in coastal communities, whose livelihood depends on the fishing. The present annual production of fish and fishery products is estimated to be 650 000 mt, which includes 250 000 mt of freshwater fish, produced mainly by aquaculture. Of these, about 130 000 mt is annually exported from Pakistan, whereas the remaining fish is consumed directly or indirectly. A substantially large quantity of fish is converted into fishmeal for the local poultry industry. Poultry fed on locally produced fishmeal is also consumed; therefore, this fish is also indirectly consumed locally.

Import of fish for local consumption started about 20 years ago when large size Rohu Carp (Labeo Rohita MMK) was imported from Myanmar and marketed in the Punjab, mainly in Lahore. At that time, farm-gate price of Rohu in Punjab was about Rs 230/kg (1–3 kg) whereas imported Rohu (3–5 kg) was about Rs 120/kg. This created a demand for imported Rohu in the Punjab and at one time (between 2002 to 2006) about 3 000 mt of Rohu was annually imported from Myanmar. Government agencies could not cope with the situation. Rather than taking steps to reduce the cost of production of locally produced Rohu, small qualities of Rohu are still imported from Myanmar and Bangladesh.

During the past decade imports of Pangasius fillets from Viet Nam started to find their way into the local seafood trade. Being of bland taste and free from any spine, these important fillets got very popular in Pakistan. In 2003 about 1 000 mt of Pangasius fillets were imported from Viet Nam, which gradually increased. It is estimated that since 2012 about 15 000 mt of Pangasius fillets were imported into Pakistan. Initially these fillets used to have only 10 percent glazing (with water) but to keep the prices on the lower side, Pakistan importers have ordered Vietnamese suppliers to increase glazing to about 40 percent. This ultimately backfired. Consumers started realizing that they were paying extra for the water instead of the fish. Simultaneously, Vietnamese authorities consider this to be against business ethics; therefore, it is now mandatory to have a level of glazing lower than 10 percent. As a result, the price of Pangasius has increased substantially (Rs 450 to 500/kg compared to the previous rate of Rs 250 to 300/kg in retail stores).

Although the demand for Pangasius fillets is now decreasing, still it is generally appreciated because it is free from bones and ready for cooking with a bland taste and year-round availability (at least in super stores). Demand for local fish, including fish fillets, is increasing in Pakistan. The media has played a key role in increasing the demand for local fish varieties. A number of television and radio programmes keep mentioning local varieties of fishes in their cooking and other programmes, therefore, demand for the local variety of fish is now showing an increase.

The Government of Pakistan through its Marine Fisheries Department has implemented a project on "Fish Marketing and Utilization" in the late 1980s and early 1990s, which aimed to increase utilization of local fish especially utilizing cheaper varieties of fish. This project has helped in developing marketing for cheaper varieties of fishes in Karachi and in upcountry areas. Various value-added products, mainly having Pakistani flavours and presentations, (kofta, kebabs etc.) have been developed and marketed, which has helped in getting the Pakistani fish popularized in the country.

Recently, under the aegis of the Fisheries Development Board, (operating under the Ministry of Food Security and Research) a modest processing facility for fish was established in Islamabad, which shows promising results from a variety of fishes, which are now being processed and marketed. Because of various initiatives of the government, as well as by private entrepreneurs, demand for domestic fish is increasing rapidly. Establishment of super and hypermarkets in the country has also helped in the development of a fish marketing system in Pakistan. Most of these stores, located in Karachi and all large cities, also carry local fish varieties, which are popular. A number of value-added products are also available at these outlets and they are boosting demand for domestic fish in Pakistan.

Regional examples of Blue Growth approaches in inland and marine fisheries

Scope and practice of fisheries co-management approaches in South Asia Co-operative Environment Programme (SACEP) region

Mr Pulakesh Mondal, SACEP Senior Programme Officer (Regional), Colombo, Sri Lanka

Small-scale inland and coastal fisheries are very important sectors in the South Asian region, making enormous contributions to the nutrition and livelihood of the people in this region. It is also now increasingly recognised that fisheries is an important contributor to the national economies of some Asia-Pacific countries, especially those in the Asian region. This sector is providing jobs for the millions of people. Bangladesh is one of the world's leading inland fisheries producers, which presently stands as the fourth biggest inland fish producer in the world.

All over the world, local commons are facing more and more complex situations due to changing socio-economic, political, ecological and cultural conditions of their livelihood. The conventional fisheries management approach has been widely called part of the problem, rather than part of the solution of resource exploitation and management. Ineffective centralised fisheries management is needed to change the structure of governance. Fishers can no longer depend on government to solve their problems. The crisis in fisheries and coastal communities is pressuring national governments to look for alternative management strategies. Earlier, public fisheries sectors were managed through a leasing system, or by fisheries agencies, to take full responsibility of managing the resources in some Asian countries. Co-management in fisheries is an approach that allows fishers to fully participate in a shared decision-making process with fisheries agencies, in the sustainable management of fisheries resources. It is slightly different in different countries. More attention should be given to fishers and fisher communities to enhance their full participation in the management of fisheries resources.

Bangladesh, India, Pakistan and Sri Lanka are the leading countries in coastal and inland fisheries sector in the South Asian region. These countries are also very rich in public inland and coastal water bodies, which is an important fisheries sector for these countries. In Bangladesh, lakes, canals, rivers and estuaries cover an area of 4.56 million hectares (ha) (DoF, 2005). Inland fisheries development activities in Sri Lanka began in the early twentieth century and total inland water bodies in Sri Lanka total 163 172 ha (Source: Irrigation Register and the Mahaweli Authority). Fishing communities in India are not homogenous, as they belong to different castes. These communities have their distinct social, cultural governance structures and traditional practices, depending on the coast and location they inhabit. Tamil Nadu, Andhra Pradesh, Orissa, West Bengal, Gujrat, Maharashtra, Karnataka and Kerala are very rich in inland fisheries comprising rivers, canals, lakes, wetlands, ponds and estuaries (Books: Anthropological resources). Aquaculture is a rather recent activity in Pakistan and is still in its infancy; nevertheless, there is immense potential for development of the sector. According to the latest estimates, the total area taken by fishponds across all provinces is about 60 470 ha, with about 110 000 ha comprising warm water natural lakes (FAO).

The implementation of co-management is costly, complex and long. It will not necessarily work in every community. South Asian countries are practising fisheries co-management and have many successful stories of sustainable fisheries management. These regions also have huge scope and potential to practise co-management in public inland and coastal water bodies.

Knowledge management for responsible fisheries development – initiatives in Bay of Bengal region

Mr Rajdeep Mukherjee, Project Coordinator, Oceans Partnership for Sustainable Fisheries and Biodiversity Conservation – Models for Innovation and Reforms: Bay of Bengal Project & Dr Yugraj Yadava, Director, Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO).

Information and knowledge are integral parts of ensuring fisheries. The 1995 CCRF reflects this need quite clearly and lays heavy importance on scientific evidence, traditional knowledge and access to information and knowledge. To start with, a knowledge management framework can be thought of as a framework for managing information and explicit knowledge (e.g. research work, etc.) so as to ensure informed stakeholders and evidence-based management and an effective participatory decision-making process. The Bay of Bengal Programme (BOBP) has a long history of Knowledge Management (KM) even when the concept was not in vogue. As a field programme of FAO, since 1979, BOBP captured both folk and expert knowledge in the fisheries sector through various documentation methods (e.g. print, photographs, street play, videos). These knowledge products were later also digitized for easy accessibility.

While such efforts continue, since 2010, the BOBP-IGO, undertook a major programme of mapping fish markets in its member-countries (http://bobpigo.org/html_site/fishmarket/index.htm).

Fish markets are nerve centres in the fisheries supply chain with both upward and downward linkages. An inventory of these markets allows better interventions to be planned for demand estimation, supply mechanism, price support and quality of food products. So far, the programme is completed in Chennai, Dhaka, Colombo and Malé. Subsequently, in association with the Ministry of Fisheries and Agriculture, Government of Maldives, BOBP-IGO developed the “Atolls of Maldives” interactive website (<http://www.atollsofmaldives.egov.mv/atolls>). The website provides 360 degree information on atolls and islands comprising demography; infrastructure; environment; marine protected areas; land use; etc., which is proving useful in planning many developmental and livelihood activities.

In Bangladesh, a process is underway to develop a web-based application for registration and licensing of fishing craft. The application will further strengthen the regime of the ongoing MCS programme in Bangladesh. The BOBP-IGO, in association with the Bay of Bengal Large Marine Ecosystem (BOBLME) Project, also digitally archived over 50 000 images dating from 1979 through 2015. This digital archive tells its own story of fisheries development in the Bay of Bengal region and also for areas outside the bay. The latest initiative in KM in the region is in Tamil Nadu and Puducherry, India. The BOBP-IGO has proposed an IT enabled hub and spoke model of Knowledge Management for Fisheries (KMF). One hub will be located in the Department of Fisheries (administrative unit) and the other hub in Tamil Nadu Fisheries University (research, folk knowledge, information). The spokes will connect these hubs to district and sub-district fisheries offices as well as to sister concerns. The departmental website will provide scope for interaction and knowledge exchange. The KMF process in the region is yet to attain maturity and needs sustained internal and external support to develop. However, it is expected that as countries are moving towards an ecosystem approach to fisheries, the framework in place will provide the initial support and evolve with new developments.

Fisheries in the lower Mekong Basin: an update

Mr Ngor Peng Bun, Mekong River Commission (MRC), MRC Fisheries Team, Phnom Penh, Cambodia

Inland fisheries of the Mekong River Basin are amongst the largest fisheries in the world. More than 1 000 fish species are estimated in the basin, of which, about 877 freshwater fish species have been recorded. A recent estimate indicated that fisheries in the Lower Mekong Basin (LMB) produced annually about 4.4 million tonnes of which about 2.3 million tonnes were from capture fisheries. Its annual economic value was up some US\$ 17 billion; about US\$ 11 billion was from capture fisheries. The average fish consumption in the basin was estimated at around 63/capita/year given the LMB population size of about 68.9 million in 2015. The LMB fisheries engaged around five million people as fishers, fish farmers, fish processors and traders. Through MRC routine monitoring programmes, at least 506 fish species belonging to 83 families were recorded. Cyprinidae, Pangasiidae, Bagridae and Siluridae made up of around 90 percent of the catch, of which about 80 percent was from Cyprinidae alone. Catch rate trends in the lower Mekong mainstream, the 3-S Rivers (Sekong, Sesan, Srepok) and Tonle Sap River of Cambodia as well as in the Viet Nam Mekong Delta tend to decrease over time, especially in the last five years. However, catch rates reported in the Mekong mainstream in Lao PDR oscillated with no clear trends. In the Tonle Sap River, catches of large and medium-sized fish species tend to decrease while those of small-sized fish species tend to increase. This may be an indication of overfishing. The findings may be important to inform policy and decision-makers for both fisheries management and water infrastructure development interventions in LMB.

Blue economy initiatives in fisheries in the Coral Triangle

Dr Jose Ingles, World Wildlife Fund (WWF)

The Coral Triangle Initiative, a regional cooperative agreement among the governments of Indonesia, Malaysia, Philippines, Papua New Guinea, Solomon Islands and Timor-Leste was formally signed in 2007 to protect, conserve and maintain the health of the most biodiverse marine region in the world.

Aptly called the Coral Triangle Initiative for coral reefs, food security and fisheries, it provided the regional framework for WWF to support and pursue a sustainable blue economy agenda in the region.

This presentation will show the initiatives of the WWF coral triangle programme and share the experiences and lessons learned when engaging primarily with the business sector to promote the WWF principles of sustainable Blue Growth in fisheries.

REBYC-II CTI: The way forward for trawl fisheries management in Southeast Asia and Coral Triangle region

Mr Sayan Promjinda, Isara Chanrachkij and Richard Gregory, Regional Facilitation Unit of Project GCP/RAS/269/GFF Strategies for Trawl Fisheries Bycatch Management (REBYC-II CTI and Southeast Asian Fisheries Development Center (SEAFDEC)

Project REBYC-II CTI was based on the experience of FAO Project Reduction of Environmental Impact from Tropical Shrimp Trawling through the Introduction of Bycatch Reduction Technologies and Change of Management (REBYC). Project REBYC-II CTI aims to contribute to the more sustainable use of fisheries resources and healthier marine ecosystems in the Southeast Asia and Coral Triangle Waters by reducing bycatch, discards and fishing impact caused by trawl fisheries. Specific technologies and practices will be identified to support the development of management plans in partnership with relevant organizations, e.g. FAO/APFIC, BOBLME, Sweden, including with the private sector at both national and regional levels. Project planning and implementation is structured around four main interrelated components:

- 1) Policy, Legal and Institutional Frameworks;
- 2) Resource Management and Fishing Operations;
- 3) Information Management and Communication, and
- 4) Awareness and Knowledge. Project REBYC-II CTI is implemented from year 2011 to 2015.

Five countries, namely, Indonesia, Papua New Guinea, the Philippines, Thailand and Viet Nam are participating in the project. SEAFDEC, as Regional Facilitation Unit, based in Samut Prakan, Thailand is responsible for supporting the participating countries for planning and implementation.

Strengthened on the concept of an Ecosystem Approach to Fisheries Management, the foreseen result of the five-year project implementation shows the improvement of trawl fisheries management in pilot size of the West Samar Sea of the Philippines, the Gulf of Papua New Guinea and in Kien Giang Province of Viet Nam. The project also technically supports the formulation of fisheries management in Thailand and implementation of the Arafura Sea Fisheries Management Plan of Indonesia.

Enhancing capacities of fishing communities through implementation of the FAO-Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries (VGSSF)

Mr Vivekanandan Vriddagiri, International Collective in Support of Fishworkers (ICSF)

The “Blue Growth” concept of FAO appears to provide a new meta-framework that integrates the various concepts and frameworks like the CCRF and EAF that FAO has already promoted for many years. This appears to be the result of a need to provide fishery policy-makers and administrators with an over-arching framework that provides coherence among the various frameworks that FAO has been promoting. More importantly, it appears to provide a new packaging and branding that provides a more “positive” slant on things instead of the usual “gloom and doom” scenarios that emerge from the usual talk of fisheries regulations, IUU fishing, climate change, etc.

In this context, it is important to examine what this Blue Growth idea means to FAO’s brand new instrument, the VGSSF, or the other way around. As an important partner with FAO in the entire process of formulation of the VGSSF, the ICSF has a great stake in the implementation of the VGSSF. Hence, the ICSF is giving importance to the task of understanding the implication of Blue Growth for small-scale fishers. Given that the largest numbers of fishers are in the Asia-Pacific region, the implications of Blue Growth are even more important for this region.

This presentation looks at some key elements of VGSSF that need to be taken into consideration while preparing Blue Growth strategies. It emphasises that the “Blue” part of “Blue Growth” in the Asia-Pacific will significantly involve proper consideration of the status of small-scale fishers and their communities and provide adequate checks to ensure that growth is not at the expense of small-scale fishing communities and that such growth actually benefits them and makes a contribution towards achieving the goals of the VGSSF.

Regional initiatives on combating IUU fishing in Southeast Asia and optimizing energy use in fisheries in the Southeast Asian region: fishing vessels energy audits

Mr Bundit Chokesanguan, SEAFDEC

The project on the Promotion of Sustainable Fisheries and IUU Fishing-related Countermeasures in Southeast Asia, which is being implemented by SEAFDEC with funding support from the Japanese Trust Fund, includes the Promotion of Fishing Licenses, Boat Registrations, and Port State Measures in Southeast Asia to pave the way for the development of a regional record of fishing vessels starting with vessels measuring 24 metres (m) or more in length during its first phase. It is expected to be

expanded later with the recording of vessels measuring less than 24 m in length. Through this project, SEAFDEC has been extending assistance to the countries in the region in their endeavours to improve their respective fishing licensing systems to conform to regional and international requirements and in combating IUU fishing in their respective waters. SEAFDEC envisions that the establishment of regional fishing vessel records together with the refined fishing licensing systems could be effectively used as fisheries management tools in combating IUU fishing in the Southeast Asia region.

Despite the increasing demand for fish and fishery products in view of their importance to human well-being, global fisheries production is at risk of falling off due to escalating and volatile fuel prices. Since the turn of the 21st century, the real global price of fuel has more than doubled and is characterized by unparalleled volatility. Rising fuel prices have also generally outpaced increases in fish prices, making it difficult to offset this differential without landing more fish per unit of fuel consumed, or reducing other fishing costs. Subsequently, the profitability of many fishers in Southeast Asia is under threat, jeopardizing the livelihoods of fishing families, communities and others that directly rely on wild-caught seafood. The high consumption of fuel by the commercial fishing industry is also a concern because of its link to greenhouse gas emissions and climate change. According to Tyedmers et al. (2005), the global commercial fishing industry produces approximately 1.7 tonnes of greenhouse gas emissions for every 1 tonne of live-weight seafood and is responsible for over 1 percent of the greenhouse gas emissions from all sources combined. Starting in late 2013, FAO and SEAFDEC launched a Fishing Vessel Energy Audit Pilot Project in response to concerns on high and variable fuel costs and associated greenhouse gas emissions from Thailand's commercial fishing industry. The project was aimed at evaluating fuel consumption in single-boat trawl fleets and identifying potential fuel savings through energy efficient fishing operations and practices. This project also applied energy audits to trawlers in single-boat trawl fleets. It is envisioned that results of this pilot project could also be adapted in other countries of Southeast Asia to ensure that trawl fisheries are not only cost-effective, but also environmentally efficient.

Blue Growth in Asian aquaculture

Aquaculture of Pangasius in Viet Nam as an alternative sustainable food source

Ms Nguyen Thi Hong Nhung, Viet Nam Fisheries Administration, Viet Nam

Aquaculture in Viet Nam contributed 57.42 percent of total fisheries production in 2014 with estimated at 3.6 million mt. The area of aquaculture farms covered 1.3 million ha, increased by 8.4 percent compared to the year 2013. Out of the total, Pangasius aquaculture production contributed 20 percent, while shrimp contributed 50 percent in 2014. Pangasius has been cultured widely in 11 provinces of Viet Nam's Lower Mekong area, estimated at 5 550 ha in 2014. The production recorded a total of 1.1 million mt. Total exports of Pangasius products are estimated at US\$ 1.8 billion in 2014, concentrating on the European Union (EU) market. Although, slightly decreased in three major markets, namely the EU, USA and ASEAN markets, Pangasius exports remains robust for world consumption. Consumers and market concerns about environmental and ecological protection, traceability, food safety assurance, fish health, welfare and social responsibility have been addressed through government interventions with strict standards, international standard compliance and law and enforcement placement. These interventions assure consumers and markets of the quality and safety of Pangasius production. It is Viet Nam's vision to capture the alternative food source from Pangasius for the world markets.

Planning for mariculture development in the Maldives

Mr Hassan Shakeel, Maldives

In Maldives the Tuna catch, which has been the major fishery for years, has declined recently. Some reef related fisheries such as those of grouper and sea cucumber, which are additional sources of income to the Tuna fishers, are also currently declining. In this situation mariculture is seen as an alternative or additional source of income to fishers. For this and other reasons mariculture development has become a fisheries sector priority.

The vision of mariculture development: A globally competitive, technologically appropriate, and diverse mariculture sector in the Maldives generating products that meet high standards for safety, quality, and environmental stewardship, with maximum opportunity for employment, profitability and economic growth. The goals of the mariculture development are to:

- Increase supply of nutritious, safe, high-quality seafood for export and local markets.
- Minimize the declining contribution of the fisheries sector to the national GDP
- Develop in the country or acquire from other countries appropriate mariculture technologies and transfer them to communities and the private sector
- Create employment and alternative livelihood opportunities in the country, particularly in the outer atolls
- Create a skilled workforce capable of working in the envisaged mariculture sector
- Develop an aquafeed sector that uses local and imported ingredients
- Integrate environmental conservation, biosecurity, biodiversity, and aquatic animal health into mariculture development

The model adopted for mariculture development is a hatchery-centred, non-vertically integrated system, which gives opportunities to involve more community groups and small scale operators, greater gender involvement, less risk involved, as each operation is independent of the other when compared with a vertically integrated system.

The commodities to be encouraged immediately are the high valued Tiger Grouper and Sandfish, for which culture techniques are already available. The medium-term commodities include Rabbitfish, White Teatfish, marine ornamentals, giant clams, and half-round pearl.

To ensure the quality of the cultured commodities it has been planned to provide aquatic animal health services; exercise control on imported feed and feed ingredients; provide training on farm-made aquafeed production and storage; and, follow better management practices. The aquaculture products will be exported, or will be supplied to local mass, or niche tourist markets.

Under the mariculture plan, training will be conducted on product quality assurance, mariculture of major planned commodities and aquaculture research. In addition to training improvement of infrastructure capacity of the production and research facilities will be carried out as other institutional strengthening measures. The research aspects of the plan include, adoption of available mariculture technologies from other parts of the world; oyster spat collection, culture and potential use of spat; and, environmental impacts of mariculture on the coral reef environment.

Aquaculture status of Bhutan and its further development

Mr Partiman Rai, Bhutan

Bhutanese aquaculture existed since the birth of the National Centre for Aquaculture in Gelephu in 1982 (It was formerly the National Warm Water Fish Culture Centre.) From 1990, many obstacles hindered its path until 2003, completely paralyzing the sector. However, in 2003, the situation improved and in 2005 the sector was revived with activities that led to its present path. Therefore, Bhutanese aquaculture is still in its infancy. Import figures of both fresh and value-added fish and fish products from outside have skyrocketed leading to continuous large out-flows of financial resources. In recent decades, the Royal Government of Bhutan is focusing on the sector with the many strategies and initiatives, such as:

- Undertaking research to develop aquaculture technologies, including farming of food fish and breeding of ornamental fish, to enhance Bhutan's food security and to secure livelihoods, especially by Bhutan's rural populace;
- Disseminating aquaculture technologies;
- Supporting the adoption of aquaculture technologies by Bhutanese;
- Providing technical support to existing Bhutanese aquaculturists;
- Supporting the development and conduct of aquaculture ancillary activities;
- Directly conducting special aquaculture activities such as establishment of government mega-fish farms to reduce fish imports;
- Engaging as a collaborator in efforts to conserve and develop native fisheries such as the endangered Golden Mahaseer; and,
- Supporting the formulation and development of national fisheries and aquaculture policies.

Myanmar's Blue Growth approaches in aquaculture

Dr Aung Naing Oo, Deputy Director, Department of Fisheries, Myanmar

Myanmar has a lot of potential to develop in marine and coastal aquaculture. Although Myanmar conducted the shrimp culture with the semi-intensive culture system in some scale since the last decade, it encountered constraints to the sustainable development of shrimp aquaculture. The constraints included, disease outbreaks, lack of local availability of cost-effective quality shrimp feed and poor development of infrastructure, such as electricity, freshwater availability and road access to

markets. In recent years, the development of shrimp culture in Myanmar is being improved by increased availability of shrimp seed in local areas due to increased development of infrastructure such as electricity, road access in coastal areas, especially Rakhine State, one of the most shrimp-cultured places in Myanmar.

Penaeus monodon has been initiated since early 1980 practicing trap and hold methods particularly in western coastal areas. Natural post larvae of *Penaeus monodon* were trapped into the pond during high tide periods through sluice gates. In 2002, a pilot demonstration project on environmentally friendly shrimp aquaculture was conducted using semi-intensive techniques in collaboration with the Department of Fisheries (DoF) and SEAFDEC-AQD. In recent years, Myanmar has had three types of shrimp farming: Semi-intensive, on 1 774 ha, extensive on 37 155 ha and traditional trap and hold on 53 496 ha totalling 924 428 ha. That means 50 percent of shrimp ponds using traditional methods and resulting in low production. Myanmar needs to improve the traditional method to extensive plus, or to semi-intensive method in shrimp culture. *Penaeus vannamei* has many advantageous factors for culture, but it may also cause a negative impact on other shrimp aquaculture farms. In marine fish farming, Sea Bass, Red Snapper and Grouper are the most common and commercially viable species in Myanmar. Seed production of Sea Bass has been successful since 2006. Myanmar needs to develop breeding techniques for other commercial marine fishes. Some other marine species were successful on an experimental scale in farming, such as oysters, clams, seaweed and molluscs. Grouper culture was started in 2005 by the private sector in the southern region of Myanmar. However, the poor development of Grouper hatchery technology created a bottleneck for development of Grouper culture in Myanmar.

Mud crab seed production technology is also needed in Myanmar. Mud crab fattening (Soft-shelled crab farming) has become a booming industry in Myanmar and export demand is also growing rapidly. Soft shell mud crab farming has become very popular in Myanmar. Myanmar has faced a decline in the supply of crab juveniles from nature due to over-exploitation, habitat deterioration and climate change. Myanmar's DoF encourages expansion of the development of marine and coastal aquaculture in suitable areas by technical assistants of partner institutions, neighbouring countries and regional organizations, such as the Network of Aquaculture Centres in Asia-Pacific (NACA) and SEAFDEC-AQD (Aquaculture Department).

To achieve Blue Growth aquaculture in Myanmar, there needs to be fewer restrictions on land use, better access to formal credit for fish farmers and other small and medium enterprises in the value chain, increased private investment and competition in the feed sector. Greater development of "hard" infrastructure is needed, such as roads, electricity and also "soft" infrastructure, including human capital, extension services, disease control and public investment in seed production technologies for promising species.

Blue Growth approach in aquaculture in Thailand

Ms Jutarat Kittiwonich, Thailand

Aquaculture plays an increasingly important role in food security and the economy of Thailand. Aquaculture contributed around 35 percent of the country's total fish production in 2013. The total production from inland and coastal aquaculture was approximately 436 000 and 562 000 tonnes, respectively. Inland aquaculture is mainly for domestic consumption and is marketed as fresh product, particularly Tilapia, Catfish, Silver Barb, Gourami and Giant River Prawn. Coastal aquaculture usually produces high-value products; White Shrimp and Black Tiger Prawn are mainly for export while marine fish (Sea Bass and Grouper) and shellfish (Green Mussel, Blood Cockle and Oysters) are mainly for domestic consumption.

The Thailand Department of Fisheries under the Ministry of Aquaculture and Cooperatives is highly concerned with more efficient and sustainable aquaculture growth. Efforts to improve efficiencies and sustainable growth include, better utilization efficiency of aquaculture resources, reducing aquaculture's impact on the environment, increasing the resilience of farmers, and improving the quality of life. In order to support sustainable aquaculture growth, Thailand has adopted good governance, site selection and zoning, as well as good farm practices that strengthen aquaculture management.

The following projects in Thailand have adopted the Blue Growth approach:

- 1) *The Royal Sea Farming and Aquaculture Demonstration Project* under the initiative of Her Majesty Queen Sirikit: this project promotes seafood products produced from the integrated environmental friendly and balanced farming system;
- 2) *Green Aquaculture City Project for Shrimp Farmers*: this project promotes low input, reduced waste, improved waste management and development of economically viable use of waste by-products, and
- 3) The farm demonstration project for biological water treatment using seaweed in the re-circulation system of white shrimp culture. The knowledge and technology transferred to the farmer aims to develop responsible and sustainable aquaculture in Thailand.

Integrated economic zone development based on blue economy in Lombok: an implementation of a regional initiative on Blue Growth in Indonesia

By Maskur Maskur, Dian Sukmawan (Directorate General of Aquaculture, Ministry for Marine Affairs and Fisheries (MMAF), Ahmad Zamroni and Nyoman Radiarta (Fisheries Research and Development Agency, MMAF)

Blue Economy is a business concept developed to answer the present challenge of the world economy, which has a tendency to be exploitative and destructive to the environment. Apart from poor waste management, natural depletion is also caused by over-exploitation of the natural carrying capacity. This concept offers a wide opportunity for investment and business development to be more economically and environmentally profitable as the business will utilize efficient resources and environmentally sound zero waste methods, more efficient and cleaner production systems, producing more product in quantity and economical value, promoting innovative and creative technology, increasing work labour absorption and providing extensive opportunities for increased fair profit for each contributor.

The Ministry for Marine Affairs and Fisheries has conducted programmes supporting the implementation of the Blue Economy. For instance, the design of spatial planning for Central Lombok and East Lombok Regencies, West Nusa Tenggara Province by Directorate General of Marine Spatial Management (previously Directorate General of Marines, Coastal and Small Islands); Aquaculture technology development to support Blue Economy implementation by the Research and Development Agency; and the Directorate General of Aquaculture has conducted pilot projects showcasing aquaculture businesses such as IMTA, seaweed, Grouper and White Shrimp culture.

In order to implement the Blue Economy in a more focused and confident way, MMAF has been working together with FAO to carry out a collaborating project entitled "Integrated Economic Zone Development Based on Blue Economy in Lombok Island," or TCPF INS/3501 Baby-03, which aims to bolster cohesive economic zone in enhancing aquaculture development on the Blue Economy basis in Lombok by focusing on seaweed, grouper, and white shrimp (*L. vanammei*). However, due to limitation of the project budget, the project only concentrated on seaweed and grouper. The choice of seaweed and grouper was made because of its availability and potential in West Nusa Tenggara

province. Seaweed development has been applied using less advanced technology, providing more labour absorption and generating more derivative products. In addition, the business may be done at home-industry scale and has a vast opportunity for the domestic and overseas market. On the other hand, grouper was selected for its economic value both in the domestic and overseas market.

The final output of this project is the detailed zoning plan guidelines on the Blue Economy based on aquaculture. The guidelines are comprised of a zoning plan, carrying capacity, value chain analysis, business connectivity and infrastructure plan in Central and East Lombok Regencies. The guidelines will become the basis for Blue Economy implementation by local government with the involvement of stakeholders, investors and financing institutions, as well as the continuous support from the central government. Consequently, in this great occasion we would genuinely urge the local government counterparts of Central and East Lombok Regencies to plan the implementation of Blue Economy gradually, based on the composed guidelines and to adopt it as a recommendation for policy advice.

Facilitation of Blue Growth: Regional collaboration and partnership for aquaculture development in the Asia-Pacific region

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NACA was established on the principle that cooperation, partnership and sharing among member governments is a practical and cost-effective means to facilitate development through south-south transfer of appropriate technology and expertise. Over the years NACA has been striving to respond to and address some challenging issues in development that are national of priorities and regionally relevant to promote sustainable growth of aquaculture. These issues include imperious need for production intensification to meet increasing seafood demand for a growing population, negative impacts of the sector on the natural environment, food safety and some social economic concerns. Major efforts have been devoted to nurturing an enabling institutional environment, information sharing and capacity building, technological extension among member governments, development and dissemination of BMPs and inclusion and empowerment of small-scale farmers. This presentation summarizes NACA's experience in facilitating Blue Growth in aquaculture in Asia-Pacific.

Promoting the national fisheries product standard in Cambodia for dried fish “treyngeat” and fish paste “prahoc”

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One of the four priority areas of the Royal Government of Cambodia (RGC) in its “Fifth Legislature of the Rectangular Strategy – Phase III and National Strategic Development Plan (NSDP) 2014–2018” is to promote livestock farming and aquaculture. The objective is to promote more livestock farming and aquaculture through a policy framework based on value chain development and the removal of barriers to the development of this sector. The strategy takes into account issues such as food safety standards and market regulation functions (especially sanitary and phyto-sanitary standards). A fisheries sector strategic plan for 10 years from 2015–2024 is being developed and includes the fisheries value added as one of four pillars.

Cambodia is a country in which many people rely on the sector for their livelihood. More than 6 million or 45 percent of the total population consume more than 52.4 kg/capita/year of fish. Most people consume fresh fish but some is processed in many traditional ways such as fermented fish, fish sauce, dried fish, fish cake, shrimp paste, dried shrimp, frozen shrimp, dried squid, fish paste. Among these traditional products, two are unique to Cambodia: Fish Paste (Prahoc) and dried fish

(Trey Ngiet). Prahoc is a very important product in Cambodian cooking. It is both an ingredient in cooking and also as a stand-alone dish, especially for rural people during the annual peak season of wild fish harvesting (between the months of November to December). Households process some 50-100 kg of Prahoc for home consumption, but also produce some for sale. Population increases and the impact of climate change have caused declines in wild fisheries production.

A survey was carried out on Prahoc and dried fish production and marketing, revealing that Prahoc and dried fish production is limited by quality, safety, packaging and access to markets. A lot of value and quality is lost due to limited knowledge of processors and traders. Prahoc is produced in Siem Reap. These products cannot enter international markets due to quality, safety and poor packaging. However, much is sold regionally to Viet Nam and Thailand and may be re-branded and sold on. The Government of Cambodia should undertake interventions and develop a strategy to respond to the problems of this sector. The objectives could include improving quality, safety certification systems, product standard development and production technology development, code of conduct development and other procedures and guidelines.

Development of national product standards would also help marketing. Three national product standards were supported by the FAO-TCP, funded by the European Union, but further work is required. Cambodia also would like to extend this standard to regional and international standards too.

The role of INFOFISH towards sustainable Blue Growth in fisheries in the Asia-Pacific region

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INFOFISH is an intergovernmental organization for marketing information and technical advisory services in the Asia-Pacific region based in Malaysia and has thirteen member countries. INFOFISH is the Asia-Pacific component of the Fish Info Network (FIN) of FAO.

INFOFISH caters to the information needs of fishery stakeholders in the Asia-Pacific region, collecting, analysing, compiling, and disseminating data through publications produced by INFOFISH.

Training workshops, technical and trade conferences organized for commodities which contribute to the Blue Growth of the region, always address the latest issues and developments and make recommendations on how to achieve sustainable development going forward.

Training, awareness and knowledge is crucial in achieving Blue Growth in a productive and sustainable manner in order to ensure a responsible approach to the environment and fishery resources.

Executing projects, providing consultancies, producing technical manuals for the fishery industry are additional activities carried out by INFOFISH that have a significant impact on improving exported fisheries products in compliance with market access requirements.

The ongoing CFC/FAO/INFOFISH project on promotion of processing and marketing of freshwater fish products from five select countries is designed to encourage the sustainable use of freshwater fish resources in the selected countries with a view to value-added processing and marketing.

INFOFISH TUNA, the World Tuna Conference meets biennially and is fully dedicated to the Tuna industry. INFOFISH TUNA is the world's largest Tuna gathering, offering participants a chance to explore issues, challenges, innovations, farming experiences and find ways to achieve sustainable growth of Tuna industry. Tuna is one of the major contributing species to Blue Growth in Asia-Pacific

and the world. Tilapia and Ornamental Fish conferences are similar kinds of product specific conferences organized by INFOFISH and are well known to industry stakeholders of the Asia-Pacific region.

Can mangroves and aquaculture co-exist? Case studies from Mangroves for the Future (MFF) countries

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In most of the MFF⁴ countries South and Southeast Asian countries, mangrove conservation and aquaculture development, especially shrimp are national priorities. It is a precarious situation, because shrimp farming has had a tremendous impact on mangroves. For example, in Indonesia, the value of mangrove-based fisheries, especially farmed shrimp is worth around US\$ 1.8 billion a year, the highest value among Indonesia's fishery products (Ministry of Marine Affairs and Fisheries, 2013). On the other hand, 750 000 ha of mangroves were lost because they were converted into shrimp ponds (Ministry of Forestry, 2005). How should these two competing different land use options be reconciled?

In Ben Tre and Tra Vinh provinces in Viet Nam, MFF demonstrated mangrove-polyculture as an effective ecosystem-based approach and successfully facilitated provincial governments to consider mangrove-polyculture as an integrated part of the coastal protection strategy. In another successful pilot project in Ca Mao province, the International Union for Conservation of Nature (IUCN) and SNV Netherlands Development Organisation, a non-profit international development organization, are supporting shrimp farmers to become certified, using an organic label for an integrated mangrove-shrimp model in which each household is allocated 3 to 5 ha, of which 60 percent should be mangrove-covered according to a national regulation. Wetland International Indonesia, MFF's partner in Indonesia, has demonstrated the use of mangrove-based aquaculture in rehabilitating abandoned shrimp farms.

These successful examples from two countries have attracted policy-makers in Bangladesh to replicate the model to restore Chokoria Sundarban, where pristine mangroves were converted into shrimp ponds in the 1980s. An economic feasibility study supported by MFF showed while mangrove-based aquaculture will be economically viable in Chokaria, it is not feasible for private producers. The situation requires developing a strong incentive-based public policy to encourage the current shrimp farmers to revert part of the land area back to mangroves. However, three country cases differ in their context, showing evidence that mangrove-based aquaculture can be an option for rehabilitating mangrove areas degraded by to shrimp farming.

⁴ Mangroves for the Future (MFF) is a unique partner-led initiative to promote investment in coastal ecosystem conservation for sustainable development. The goal is to promote an integrated ocean-wide approach to coastal management and to building the resilience of ecosystem-dependent coastal communities. It operates in Bangladesh, Cambodia, India, Indonesia, Maldives, Myanmar, Pakistan, Seychelles, Sri Lanka, Thailand and Viet Nam. Mangroves are the flagship of the initiative, but MFF is inclusive of all types of coastal ecosystem, such as coral reefs, estuaries, lagoons, sandy beaches, sea grasses and wetlands. Sida, Danida and Royal Norwegian Embassy in Thailand are the donors of MFF.

Conclusions and recommendations of the Sixth RCFM for reporting to the Thirty-fourth Session of APFIC

The participants at the APFIC Sixth RCFM were presented with the consolidated conclusions and recommendations for action, which were derived from the forum meeting. These were commented on and amended and subsequently endorsed by the forum. The consolidated conclusions and recommendations of the RCFM were forwarded to the Thirty-fourth Session of APFIC (8 to 14 February 2016, in Colombo, Sri Lanka) for consideration and subsequent endorsement by the Commission.

Blue Growth-type approaches are already being promoted throughout the region

The member countries and regional organizations of the APFIC region are engaged in a wide range of programmes that involve many of the key elements of Blue Growth. The RCFM recognized that promotion of Blue Growth in the fishery and aquaculture sectors will provide sustainable benefits in terms of food security, human well-being and environmental integrity.

There is a need for clarity on the concepts and terms used for Blue Growth

Blue Growth is often used as an alternative term for Blue Economy. Whilst the two concepts have much in common, Blue Economy tends to focus on marine and ocean initiatives whereas Blue Growth encompasses both marine, brackish and freshwaters.

Recommendations – clarify the concepts, definitions and terms used for Blue Growth

- FAO should prepare a review document outlining Blue Growth concepts;
- This should explain clearly how it is a way of implementing the key normative frameworks that support it; and
- Such frameworks include for example: global frameworks such as CCRF, EAFM, International Plans of Action (IPOA) (IUU), PSM, VGSSF, and SDG's regional frameworks. Other non-fishery related frameworks may be linked such as: CDB, UNFCCC, Regional Seas, ILO and IMO.

Opportunities for Blue Growth in marine fisheries

Using an ecosystem approach to fisheries, Blue Growth has been achieved in some small-scale fisheries resulting in reduced bycatch, improved value chain, the use of selective gears, better prices for catch and use of IT in relation to prices, marketing, combatting IUU and non-compliance.

In mixed catch tropical trawl fisheries where the majority of the catch is utilized, Blue Growth through the ecosystem approach involves reduction of overall effort and improvement of overall catch value by using large mesh sizes. More effective zoning of trawling to avoid impacts on sensitive habitats in near-shore zones can contribute to containing the impact of these fisheries within sustainable limits.

The RCFM cautioned that growth in many capture fisheries may not be achieved in terms of increased production.

- Improved management in these fisheries will typically require a reduction in fishing effort;
- Economic growth can be achieved by reducing waste and improving the value of catches and reducing losses from IUU fishing;

- Blue Growth in a fishery cannot be achieved where there is significant IUU fishing activity;
- Maintaining current levels of employment in many coastal fisheries is unlikely to be possible in their current state; and,
- Blue Growth through stock recovery, improving efficiency in marine fisheries may involve a reduction in effort and in the number of fishers.

Recommendations: Support recovery of overfished or overexploited capture fisheries to ensure that they can make an optimal contribution to Blue Growth.

- This would involve developing fishery management plans which implement the Ecosystem Approach to Fisheries;
- Economic growth is such that fisheries can still be recovered through reduction of wastage and improved value of catches and reduction of loss from IUU fishing;
- Maintaining current levels of employment in many coastal fisheries is unlikely to be possible in their present state;
- Blue Growth through stock recovery and improving efficiency in marine fisheries may involve a reduction in effort and the number of fishers with appropriate compensation or mitigation; and,
- Need to have mechanisms to address loss of fishing opportunities through the introduction of seasonal bans or other management mechanisms.

Recommendations – Develop Blue Growth plans using an EAF approach. In many cases where increased production is not possible, could still benefit by improved value chain, reduced losses and reduced IUU fishing.

- There is a need to undertake fishery surveys and assessments of fisheries to ensure that plans for the recovery of stocks and in order to set realistic targets for fishing capacity and fishing effort;
- These should be supported with better identification of critical habitats and seasons and the integration of relevant measures into EAF management plans;
- There is a need to work harder to integrate related sectors into more holistic Blue Growth planning, in particular the linkages between land and water;
- Rehabilitation of degraded habitats, protection of local marine management area and other environmental strategies;
- Capture the opportunities for employment that arise from environmental restoration;
- Improve Vessel Registries and Vessel licensing;
- Reduction of subsidies;
- Combat IUU fishing;
- Fuel efficiency and reduced cost of operations;
- Research and development in new technologies, particularly those that reduce environment or climate footprint and increase economic benefits; and
- Promote decent work, safety at sea and address labour issues including transboundary migration.

Blue Growth in inland fisheries

Much of the focus for Blue Growth in inland fisheries lies in the potential to increase the productivity of inland waters. This can be achieved through enhancement, habitat manipulation and stocking. However, the major threats to inland fisheries come from external competitors for environmental

services, especially water developments and also land use changes. Urbanization and industrialization are also increasingly impacting inland waters. Blue Growth, therefore may not seek to increase productivity, but rather secure its sustainability and the economic benefits it generates.

Recommendations: Sustain ecosystem services critical for inland fisheries

- Maintaining environmental flows and freshwater connectivity between habitats;
- Critical habitat management for spawning, nursery, refuges;
- Promote fish friendly irrigation/hydropower structures;
- Promote sustainable floodplain fisheries and stock enhancements;
- Develop, restoration and management of key habitats; and
- Use of indigenous species.

Recommendations: Promote monitoring and knowledge for management

- Base fishery management planning on a strong information base, using local ecological knowledge, scientific knowledge, fishery assessments and monitoring; and,
- Work with other sectors to reduce or minimize nutrient loadings and runoffs to water bodies.

Recommendations: Support and empower inland fishers

- Promote inland fishery stocking programmes in small water bodies, based on public-private financing;
- Improve genetic quality of seed from freshwater hatcheries and impose stricter quality controls on fish stocked into freshwaters;
- Allocate fishing rights; and,
- Improve value chain and marketing.

Opportunities for Blue Growth in aquaculture

The RCFM agreed that Blue Growth in aquaculture could contribute significantly to meeting the increasing demand for fish in the Asia region. Blue Growth in aquaculture will require both improved efficiency of production, sustainable intensification as well as expansion of production area in the region. In countries with very limited aquaculture development to date, rapid growth in aquaculture may be expected with technology transfer and uptake as the demand for fish and prices rise.

Recommendations: Strengthen planning and regulatory framework

- Promote sustainable intensification of aquaculture within a Blue Growth framework;
- Increase emphasis on the management of aquaculture, including the need to zone, license farms and develop within the carrying capacity of local environment;
- Strengthened the legal framework to ensure Blue Growth principles are backed up by laws and regulations;
- Identification of sites for expansion of mari-culture and aquaculture;
- Develop zoning and carrying capacity plans;
- Allocate seabed and open water (e.g. reservoirs and lakes) to ensure that marginalization, or displacement of fishers, is avoided;
- Strengthen biosecurity to limit the transmission of disease(s); and,
- Apply precautionary approaches related to movements and introductions.

Recommendations: Promote innovations in culture systems and technology that allow higher productivity, greater intensity of production and more efficient use of inputs.

- Promote shift to lower trophic level species;
- Explore potential of smaller indigenous species and lower trophic level species;
- Improved seed production technologies to explore benefits of new species;
- Avoid or ban wild seed use for stocking in aquaculture (linked to hatchery development);
- Reduce feed use and dependence on fish meal and more efficient feed use;
- Produce fish meal alternatives;
- Reduce chemical use in culture operations, assisted by Good Aquaculture Practice (GAP);
- Exploration of species that have a tolerance to potential climate change effects (salinity, temperature etc.);
- Reduce carbon footprint of aquaculture operations;
- Explore the scope for increased participation of women in aquaculture;
- Develop private aquaculture insurance programmes;
- Develop mariculture as a means to offset declining fishery revenues and livelihoods; and,
- Maximise the potential of information technology for aquaculture management, e.g. increasing availability of IT applications (e.g. smart phone applications) that can be used by small-scale farmers to improve feeding efficiency, aeration efficiency and energy saving.

Recommendations: Promote integrated culture systems as a means to reduce environmental footprint and improve the efficiency of nutrient utilization.

- Systems that reduce overall input use or increase input use efficiency to capture benefits and allow economic growth without necessarily requiring increasing production;
- Integrated zero-discharge systems and integrated multi-trophic systems are being developed for coastal and freshwater aquaculture; and,
- Aqua-silviculture, integrated systems can be certified, and although low yielding, can produce profitability with limited risk of crop failures.

Capturing the potential of the value chain

There is a need to increase the prospect of local communities to benefit from their production (i.e. find ways to move benefits back down the value chain). Well-informed blue initiatives, including the application of EAFM will help producing countries to be better prepared and even avoid potential non-tariff and market measures imposed by importing countries.

Recommendations: Try to capture opportunities of certification/Fishery improvement/GAP and better marketing.

- Good aquaculture practice (e.g. *Pangasius* production – after the rapid growth of this sector, the focus moves to quality assurance and traceability at farm and processing levels to respond to the requirements of the value chain);
- Develop national certification schemes in line with international schemes and which also provide the relevant assurances;
- Develop fishery improvement plans using EAF and links to markets; and,
- Look for incentives, such as price premiums for organic or mangrove-friendly certification. These systems can be a driver for rehabilitation of degraded coastal environments. The ratio of farm, or pond, to mangrove habitat is variable but more economic data on the profitability of different systems is needed.

Recommendations: Promote increased preparedness to address non-tariff barriers with trade from importing countries.

- Certification and value chain improvement, improved traceability, improved food safety;
- Efforts made to harmonize standards required for trade and import of aquaculture products to facilitate trade and reduce inefficiencies and losses caused by different standards and requirements;
- Develop food safety systems and quality control capacity;
- Promote aquaculture product standards;
- Promote and develop of new products from seafood, value adding and product transformation;
- Promote GAP for key systems and commodities;
- Include carbon footprint in production system information;
- Explore the potential for carbon credits for some production systems; and,
- Seek alternative ways for post-harvest processing that are less reliant on use of fuel wood, etc.

Climate change responses

Blue Growth is climate smart and there is a range of ways to capture opportunities in existing, or innovative production systems in both capture fisheries and aquaculture.

Recommendations: Seek ways to adjust or improve systems to reduce the carbon footprint of capture fisheries and aquaculture, adapt to changing climate and increase resilience.

- Reduced energy footprint production systems (e.g. integration and use of renewable energy);
- Improve fuel efficiency in fishing and aquaculture operations;
- Adaptation of existing systems to make them more climate resilient;
- Habitat restoration and rehabilitation, such as carbon sequestration as well and improved ecosystem services (including erosion control, water retention, flood mitigation, sediment trapping etc.) in both marine and freshwater systems;
- Carbon credits and carbon sequestration (e.g. blue carbon);
- Culture of low trophic level species using lower footprint feeds; and
- Explore potential of biofuels (e.g. seaweed biomass).

Adequate safeguards and precautions

As countries become interested in Blue Growth, the RCFM cautioned that to be truly “blue” there must be safeguards built in that ensure human and environmental well-being. This requires the use of clean technology; sustaining environmental services; equitable access and safeguarding of rights; minimization of environmental impact and economic viability. It is important that in the enthusiasm for the potential for Blue Growth, that there is not an unplanned rush into Blue Growth initiatives. There is usually not enough information to adequately plan all the safeguards to ensure that Blue Growth initiatives may not meet expectations.

Poorly conceived Blue Growth initiatives may conflict with small-scale fisheries. There is a concern that large-scale developments may impact the tenurial rights of fishers, particularly where these rights are already poorly defined. New production systems, conversion of fishing areas to aquaculture, large-scale investments may result in displacement of fishers or loss of access to fishery resources by

the small-scale sector. Introduction of stocking and culture-based fisheries may also result in loss of access to the fishery by some of the existing users. Investment in value chains or larger more efficient landing sites can disadvantage existing traders and port harvest operators including women.

Recommendations – Clarify the linkages between the VGSSF and Blue Growth and build in safeguards

- The recently agreed VGSSF supports the visibility recognition and rights of small-scale fisheries;
- As a complement to the CCRF they also underpin Blue Growth. In this regard the VGSSF gives context and guidance on how to ensure that Blue Growth initiatives can contribute positively to small-scale fisheries;
- This can be achieved directly during application of Blue Growth to small-scale fisheries and also where Blue Growth initiatives are initiated in larger-scale fisheries and aquaculture interventions, to ensure that these initiatives do not undermine or compromise small-scale fisheries;
- A true Blue Growth initiative would not conflict with the spirit and recommendations of the VGSSF;
- Effective implementation of VGSSF should also be considered Blue Growth; and,
- Adequate consultation needs to be undertaken before initiating new Blue Growth programmes and these programmes should be reviewed for their coherence with the guidance in the VGSSF, CCRF etc.

Recommendations – Develop adequate safeguards and precautions

- Countries should ensure that key safeguards are built into national policies, laws and plans for planning and implementation of Blue Growth initiatives;
- Good practice in development should be followed;
- Ensure that gender mainstreaming is built into Blue Growth initiatives;
- Organisations and countries supporting implementation of Blue Growth initiatives should develop clear frameworks for integration of good practice; and,
- Pilot initiatives provide the opportunity to learn from mistakes and adjust the approach.

Recommendations – Blue Growth should not push inappropriate technology or drive producers into production systems that are beyond their financial or technical capacity to manage sustainably or economically.

- Intermediate technology approaches may be more robust and more appropriate in the short to medium term and
- Transitioning to more complex systems could take place over time.

Knowledge to support Blue Growth

The development of fishery sector management plans designed to help stock recovery, based on improved fishery stock assessments are required. Assessment of marine capture fishery resources is essential for sustainable management. In many fisheries there remain serious gaps in knowledge regarding the determination of sustainable levels of fishing effort and catch. In inland fisheries, long-term monitoring of fisheries in Mekong River Basins shows some declining trends in catches for large and medium sized species. Catch per unit effort is also declining in those fisheries that are being monitored. Exotic species in lower Mekong Basin area now comprise 3 percent of wild fishery catch (Tilapia, Pacu, Sucker Catfish), but may reach up to 30 percent in some localities. These are mainly escapees from cage aquaculture, although some species have become established in some localities.

This highlights the need for effective monitoring to inform management. Mariculture development is a relatively new initiative in many areas and thus requires a mixture of knowledge development and a precautionary approach to ensure it is a Blue Growth type activity.

Recommendation: Strengthen the assessment and monitoring of fisheries

Recommendations: Improve understanding of the potential for Blue Growth

- Development of cross-sectoral information systems that facilitate closer coordination and information exchange between stakeholders; and,
- Promotion of greater sharing of positive outcomes of Blue Growth initiatives.

Recommendation: Improve communication of science and local knowledge to support management decision-making.

- There remain considerable challenges to effectively communicate management measures to fishers and to incorporate science-based information into the development of these measures, especially when using EAF.

Recommendations: Improve monitoring of intensive aquaculture development and develop carrying capacity models for different systems.

- Monitor the impacts (environmental, social and economic) of aquaculture and mariculture development (monitoring is needed to ensure that they are contributing positively to Blue Growth); and,
- There remains a significant need to generate technical knowledge on carrying capacities for different tropical/warm water marine and aquatic environments to support effective planning and zoning of Blue Growth aquaculture development and to support effective integration of different components of integrated systems.

Recommendation: Conduct valuations of different production systems

- The true values of marine and inland capture fishery, aquaculture and integrated systems and the costs and benefits of recovery of degraded systems, are needed to provide persuasive economic arguments for Blue Growth;

Coordination with the private sector and consumers

There is a need to coordinate private sector and consumers as major drivers of investment and market demand in Blue Growth. It is important to ensure that their investments and actions are Blue Growth.

Opportunities for regional cooperation

There is potential for developing a regional cooperation programme to promote Blue Growth, in particular how to ensure that Blue Growth initiatives are truly blue. Identified areas for cooperation, which would support the promotion and implementation of Blue Growth include:

Marine fisheries

- Capacity building in fishery surveys and stock assessment and management planning;
- Joint action plans for identified, shared, or transboundary stocks;
- Training in EAF using the regional EAFM training course;

- Regional cooperation on Port State Measures; and,
- Training in vessel inspection, VMS and MCS.

Inland fisheries

- Cooperation on inland fisheries management; and,
- Transboundary cooperation on habitats, environmental flows and stocks.

Post-harvest and value chain

- Knowledge sharing on fishery product development and diversification, particularly post-harvest processing and utilization;
- Business to business, business to government, fishers platforms for knowledge sharing and lessons learned;
- Communication with consumers regarding the competitiveness of Blue Growth products and linkage of demand to supply; and,
- Explore opportunities for Blue Growth systems and products in bilateral and multi-lateral trade agreements.

Knowledge and awareness

- Development and communication of best practices;
- Development and piloting of a regional programme to promote each Blue Growth approach;
- Exchange of knowledge and training on lessons learned, innovative systems and approaches;
- Science policy platform that would also facilitate the translocation of science advice and policy to producers (e.g. Coral Triangle fishers forum and Coral Triangle business forum); and,
- Promotion of greater regional and international research cooperation related to Blue Growth.

Closing of the RCFM

In closing, the APFIC Secretary thanked the hosts, the Ministry of Fisheries and Aquatic Resource Development, Sri Lanka, for their generous support and excellent facilitation of the Sixth APFIC RCFM. The Secretary also thanked all the participants from APFIC member countries and other organizations for their active participation.

Appendix 1

List of participants

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Appendix 2

Agenda Sixth of the APFIC Regional Consultative Forum meeting

“Promoting Blue Growth in fisheries and aquaculture in the Asia-Pacific”

Colombo, Sri Lanka, 8–10 February 2016

DAY 1	
08.00–09.00	Registration
09.00–10.15	SESSION 1: OPENING AND PLENARY Opening ceremony Welcome remarks by the APFIC Secretary Address by the FAO Representative to Sri Lanka Opening speech by the APFIC Chair, the Secretary, Ministry of Fisheries and Aquatic Resources Development, Sri Lanka
10.15–10.45	“What can Blue Growth do in marine and inland fisheries in the Asia-Pacific?” <i>Representative of the FAO Fisheries and Aquaculture Department</i>
10.45–11.15	Coffee break
11.15–11.45	“The need and opportunities for Blue Growth in Aquaculture in the Asia-Pacific” <i>APFIC Secretariat, FAO Regional Office for Asia and the Pacific</i>
11.45–12.00	Forum arrangements <i>Presentation by the APFIC Secretary</i> <i>Group photo</i>
12.00–12.30	SESSION 2: Achieving Blue Growth in fisheries APFIC Regional overview of IUU fishing in marine fisheries in the sub-regions of Asia (2016) <i>APFIC Secretariat, FAO Regional Office for Asia and the Pacific</i>
12.30–14.00	Lunch
14.00–15.30	6 Country presentations on examples of Blue Growth approaches in inland & marine fisheries: Improving fisheries management and reduction of ecosystem impacts in Malaysia (Ms Hemalatha Raja Sekaran, Malaysia) Increasing the productivity of man-made water bodies (Mr Thay Somony, Cambodia) Marine Ecosystem Health and Human Well-Being (PICES-MarWeb project in Indonesia) – A good relationship between local communities and seafood diversity (Dr Masahito Hirota, Japan) United States’ Efforts in 2015 to Promote Blue Growth through Promoting Domestic Aquaculture and Mitigating IUU and Seafood Fraud (Mr Michael Abbey, USA)

	<p>Examples of Blue Growth approaches in culture based fisheries and aquaculture (Mr Nimal Chandraratne, Sri Lanka)</p> <p>Precautionary approach to sustainable growth of marine fisheries resources in the Bay of Bangle: Bangladesh Perspective (Mr Nasiruddin Md Humayun, Bangladesh)</p>
15.30–16.00	Coffee break
16.00–17.30	<p>4 Country presentations on examples of Blue Growth approaches in inland & marine fisheries</p> <p>Developing an Implementation Strategy for Fisheries and Aquaculture management and development in Lao PDR (Bounthanom Chamsinh, Lao PDR)</p> <p>Strategies to attract private sector investment in aquaculture for self-sufficiency in Nepal (Mr Rama Nanda Mishra, Nepal)</p> <p>Status of Blue Growth in Fisheries & Aquaculture in Pakistan with special emphasis on the “Reduce dependence on imported fish products and improve contribution on domestic fisheries product to providing healthy diets”. (Mr Maratab Ali, Pakistan)</p> <p>General discussion</p>
DAY 2	
09.00–10.30	<p>SESSION 3: Regional examples of Blue Growth approaches in inland & marine fisheries</p> <p>Regional examples of Blue Growth initiatives</p> <p>Scope and practice of fisheries Co-Management approaches in SACEP Region (Mr Pulakesh Mondal, SACEP)</p> <p>Knowledge Management for Responsible Fisheries Development – Initiatives in Bay of Bengal Region (Mr Rajdeep Mukherjee, BOBP-IGO)</p> <p>Fisheries in the Lower Mekong Basin: an update (Mr Ngor Peng Bun, MRC)</p> <p>Blue economy initiatives in Fisheries in the Coral Triangle (Dr Jose Ingles, WWF)</p> <p>REBYC-II CTI: The Way Forward for Trawl Fisheries Management in Southeast Asia and Coral Triangle Region (Mr Sayan, SEAFDEC REBYC-II Project)</p> <p>Enhancing Capacities of fishing communities through implementation of FAO-VGSSF (Mr Vivekanandan Vriddagiri, ICSF)</p> <p>Regional Initiatives on Combating Illegal, Unreported and Unregulated (IUU) Fishing in Southeast Asia & Optimizing Energy Use in Fisheries in Southeast Asian Region: Fishing Vessels Energy Audits (Mr Bundit Chokesanguan, SEAFDEC)</p>
10.30–11.00	Coffee break
11.00–12.30	<p>SESSION 4: Working group session</p> <p>3 working groups working on three</p> <p>Opportunities for Blue Growth in inland fisheries the APFIC region</p> <p>Precautions to ensure this growth is “blue”</p> <p>Blue Growth indicators</p> <p>Regional opportunities and needs for capacity building</p>
12.30–14.00	Lunch

14.00–15.30	SESSION 5: Blue Growth in Asian aquaculture Six country examples of Blue Growth aquaculture systems Aquaculture of Pangasius in Viet Nam as an alternative sustainable food source (Ms Nguyen Thi Hong Nhung, Viet Nam) Planning for Mariculture Development in the Maldives (Mr Hassan Shakeel, Maldives) Aquaculture status of Bhutan and its further development (Mr Partiman Rai, Bhutan) Myanmar's Blue Growth Approaches in Aquaculture (Dr Aung Naing Oo, Myanmar) Blue growth approach in aquaculture in Thailand (Ms Jutarat Kittiwanch, Thailand) Integrated Economic Zone Development Based on Blue Economy in Lombok: an Implementation of Regional Initiative on Blue Growth in Indonesia (Mr Maskur, Indonesia)
15.30–16.00	Coffee break
16.00–17.30	Five country & regional examples of Blue Growth aquaculture systems Facilitation of Blue Growth: Regional Collaboration and Partnership for Aquaculture Development in Asia-Pacific Region (Mr Yuan Derun, NACA) Promoting the national fisheries product standard in Cambodia for the Dried Fish "Trey Ngeat" and fish paste "prahoc" (Dr Kao Sochivi, Cambodia) The role of INFOFISH towards the sustainable Blue Growth in fisheries in the Asia-Pacific Region (Mrs Kumudinie Mudalige, Mr Mohd Hazmadi Bin Zakaria, INFOFISH) Can mangroves and aquaculture co-exist? Case studies from MFF countries (Mr Raquibul Amin, IUCN/MFF)
DAY 3	
09.00–10.30	SESSION 6: Working group session Three working groups working on three Opportunities for Blue Growth in aquaculture the APFIC region Precautions to ensure this growth is "blue" Blue Growth indicators for aquaculture Regional opportunities and needs for capacity building
10.30–11.00	Coffee break
11.00–12.00	Plenary presentations of the working groups
12.00–12.30	General discussion and summary of main recommendations for plenary
12.30–14.30	Lunch
14.30–16.00	SESSION 7: PLENARY ADOPTION SESSION AND CLOSING Presentation and adoption of the summary recommendations of the Regional Consultative Forum for reporting to the Thirty-fourth Session of APFIC General discussion
16.00	Closing of the Sixth RCFM

Appendix 3

Opening statements

Welcome to the 6th APFIC Regional Consultative Forum meeting

“Promoting Blue Growth in fisheries and aquaculture in the Asia-Pacific”

Colombo, Sri Lanka 8–10 February 2016

By

Simon Funge-Smith

Secretary of the Asia-Pacific Fishery Commission

Ms W.M.M.R. Adikari, Secretary, Ministry of Fisheries and Aquatic Resources development,

Ms Nina Brandstrup, FAO Representative to Sri Lanka and the Maldives,

Representatives of the member countries of the Asia-Pacific Fishery Commission,

Mr Muhammad Kurshid, Director-General of the South Asia Cooperative Environment Programme

Representatives of observer countries and organizations

Ladies and Gentlemen

As Secretary of the Asia-Pacific Fishery Commission I welcome you all to Colombo, to this Sixth Regional Consultative Forum Meeting of the Asia-Pacific Fishery Commission (APFIC).

The APFIC RCFM is organized to precede the Session of the Commission and is intended to provide a more open discussion forum to explore issues and priorities in the fishery and aquaculture sectors that are relevant to APFIC member countries and regional organizations in Asia.

The RCFM is also a mechanism by which these summary conclusions and recommendations can also be brought to the attention of the Asia-Pacific Fishery Commission during its biennial Session, which is convened immediately afterwards.

This Sixth RCFM is attended by more than 50 participants. These are representatives from 15 FAO member countries in South and Southeast Asia and representatives of nine regional organizations relevant to fisheries and aquaculture and the aquatic and marine environment.

I would like to thank you all for taking the time to participate in this regular APFIC event and also to thank you for your hard work in preparing your presentations for the Consultative Forum meeting.

The RCFM has some time devoted to a workshop type mode to try to take advantage of such a diverse group and maximize the potential for reaching consensus on the conclusions and recommendations that are the final output of the RCFM.

I have every expectation that such a diverse and competent group as this will have much to offer in terms of vision and advice and that by the third day of the RCFM we will we will have an excellent document to put before the Thirty-fourth Session.

In concluding these short remarks, I would like to express my gratitude to the Secretary, Ministry of Fisheries and Aquatic Resources and Development and the FAO Representative to Sri Lanka and the Maldives for taking the time to open this Regional Consultative Forum Meeting and for their

assistance in making the arrangements and organization of the RCFM. I would also like to thank the Government of Sri Lanka for its generous hosting arrangements that have also made possible this RCFM and the Thirty-fourth Session that follows.

Without this enthusiastic and dedicated support, the Asia-Pacific Fishery Commission could not continue to function and support the member countries and the fishery and aquaculture sectors of the Asian region.

Thank you all

Opening remarks to the Sixth APFIC Regional Consultative Forum meeting
“Promoting Blue Growth in fisheries and aquaculture in the Asia-Pacific”

Colombo, Sri Lanka 8–10 February 2016

By

Ms Nina Brandstrup

FAO Representative to Sri Lanka and Maldives

Ms W.M.M.R. Adikari, Secretary, Ministry of Fisheries and Aquatic Resources Development, Sri Lanka and Chairman of the Asia-Pacific Fishery Commission

Mr Muhammad Kurshid, Director-General of the South Asia Co-operative Environment Programme

Distinguished participants from APFIC member countries

Colleagues from regional and international partner Organizations, projects and programmes,

On behalf of Ms Kundhavi Kadiresan, Assistant Director-General of the Food and Agriculture Organization of the United Nations' Regional Office for Asia and the Pacific, I warmly welcome you all to this sixth Asia-Pacific Fishery Commission Regional Consultative Forum Meeting being held here in Colombo over the next three days.

This Regional Consultative Forum meeting allows for a biennial stock take of the work of the Asia-Pacific Fishery Commission, its member countries and regional partners. It is therefore relevant to the programme of work of the Commission and also provides an open platform to discuss and explore new and emerging ideas and issues related to fisheries and aquaculture.

This Regional Consultative Forum Meeting is entitled **“Promoting Blue Growth in fisheries and aquaculture in Asia-Pacific”**. This theme reflects the importance that Asia-Pacific Fishery Commission members have given to the opportunities to increase the pace of development of sustainable fisheries and responsible aquaculture in the Asian region. We will be hearing from member countries and regional organizations on how they are promoting fishery and aquaculture development that supports Blue Growth.

For those of you who may be new to the concept of Blue Growth you will be getting an overview of what the concept involves and also hear of some of the ways in which it can be put in practice.

It is important to understand that Blue Growth itself is a relatively new term, but it is really just an umbrella for a number of existing approaches to sustainable and responsible development of the fishery and aquaculture sectors. You will not be surprised to hear that at the core of the concept is the promotion of the FAO Code of Conduct for Responsible Fisheries and that the outcomes are targeted at ensuring sustainable development.

Honourable Secretary, Distinguished participants,

The Sixth Asia-Pacific Fishery Commission Regional Consultative Forum meeting will have a full agenda, with presentation from all the participating member countries and regional organization partners. It is a diverse agenda spanning fisheries and aquaculture, marine and freshwater and I am hopeful we will get a taste of how active the Asia-Pacific Fishery Commission member countries are in capturing the opportunities in fisheries and aquaculture that these two dynamic subsectors present.

The Forum is also tasked with developing recommendations. These will be put before the Thirty-fourth Session of the Asia-Pacific Fishery Commission for its consideration.

The next few days are therefore an occasion to highlight key priorities and areas for action in order to use the Asia-Pacific Fishery Commission as a voice for the region, and I am sure that you will take full advantage of this opportunity. Indeed, many of you will stay on for the Session as part of national delegations and the Forum thus gives you a chance to understand in greater depth some of the issues, which will be deliberated by the Commission.

The Asia-Pacific Fishery Commission, in its role as a neutral forum, is striving to forge links between member countries, regional partner governmental organizations and relevant non-governmental organizations in order to give voice to the fishery and aquaculture subsectors and those who depend upon it. In this regard, it is very encouraging to see so many partners participating here today and I would like to thank them for their support.

On behalf of FAO, I would also like to take this opportunity to thank our hosts, the Government of Sri Lanka and the staff of the Ministry of Fisheries and Aquatic Resources Development who have so enthusiastically contributed to the organization and convening of this Regional Consultative Forum meeting.

Finally, I thank you, the participants, for your participation and look forward to your contributions over the next three days to help the Asia-Pacific Fishery Commission continue to perform its functions as a regional advisory body in fisheries and aquaculture that is owned by its member countries and supports the sector in the region.

Thank you.



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