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ASIA-PACIFIC FISHERY COMMISSION

Executive Committee

Seventy-sixth Session

Manila, Philippines, 21-23 February 2017

SIXTH APFIC REGIONAL CONSULTATIVE FORUM MEETING

ASIA-PACIFIC FISHERY COMMISSION (APFIC)

SIXTH APFIC REGIONAL CONSULTATIVE FORUM MEETING

"Promoting blue growth in fisheries and aquaculture in the Asia-Pacific"

Colombo, Sri Lanka, 8-10 February, 2016

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
REGIONAL OFFICE FOR ASIA AND THE PACIFIC
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For copies write to: The Senior Fishery Officer

FAO Regional Office for Asia and the Pacific

Maliwan Mansion, 39 Phra Athit Road

Bangkok 10200

THAILAND

Tel: (+66) 2 697 4000

Fax: (+66) 2 697 4445

E-mail: FAO-RAP@fao.org

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PREPARATION OF THIS DOCUMENT

This is the final report of the Fourth 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.

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Members of APFIC

FAO Fisheries and Aquaculture Department

FAO Regional Fishery Officers

FOREWORD

The sixth Asia-Pacific Fishery Commission (APFIC) Regional Consultative Forum Meeting (SIXTH RCFM) *"Promoting blue growth in fisheries and aquaculture in the Asia-Pacific"* was convened in Colombo, Sri Lanka, 8-10 February 2016.

As part of the APFIC strategy for communicating issues and building regional understanding, the sixth Regional Consultative Forum Meeting was held to precede the Thirty-Fourth Session of APFIC and acted as a regional briefing on the activities of the Commission and her member countries. The RCFM also provided an opportunity for regional partner organizations that are relevant to the programme of work of the Commission to provide an update on their activities. This meeting was attended by 54 participants from 15 countries and representatives from 9 regional partner organizations and projects.

The Sixth RCFM identified a series of issues and made specific recommendations on the theme of "***Promoting blue growth in fisheries and aquaculture in the Asia-Pacific",*** these were based on reviews of regional fisheries and aquaculture, presentations by member countries and regional organizations, reports of action plans of APFIC regional consultative workshops

The Member countries of APFIC and regional organizations of the region are engaged in a wide range activities that involve many of the key elements of **Blue Growth**. The RCFM recognized that promotion blue growth in the fishery and aquaculture sectors will provide sustainable benefits in terms of food security, human well-being and environmental integrity. The RCFM identified a range of opportunities for the promotion of Blue Growth in Inland and Marine Fisheries and Aquaculture in the region. For the marine and inland fisheries sector, the application of the EAFM approaches is seen as important to support recovery of overexploited stocks, reduce overfishing and combat address IUU fishing. The RCFM agreed that Blue Growth in aquaculture can contribute significantly to meeting the increasing demand for fish in the Asian 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.

The commitment of APFIC member countries, regional organizations and partners shown during this RCFM reinforces the important role the APFIC RCFM has in the Asia Pacific region for the sharing of information and knowledge and raising awareness of fisheries and aquaculture issues in the region. These roles reflect the core functions of FAO to provide a neutral forum for the consideration of regional challenges in the fisheries and aquaculture sectors.

Kundhavi Kadiresan

Assistant Director General and Regional Representative

FAO Regional Office for Asia and the Pacific

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ABBREVIATIONS AND ACRONYMS

APFIC	Asia-Pacific Fishery Commission
ASEAN	Association of Southeast Asian Nations
ARFMM	ASEAN regional fisheries development and management mechanism
BGI	The FAO Blue Growth Initiative
BOBP-IGO	Bay of Bengal Program 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
CTI	Coral Triangle Initiative
CTNI	Coral Triangle Network Initiative
EAF	ecosystem approach to fisheries
EEZ	exclusive economic zone
FAO	Food and Agriculture Organization
FMA	Fisheries Management Area
GEF	Global Environment Facility
GHG	greenhouse gases
HACCP	Hazard Analysis and Critical Control Point
ICSF	International Collective in Support of Fishworkers
IPOA	international plan(s) of action
IUU fishing	illegal, unregulated and unreported fishing
LME	large marine ecosystem
MRC	Mekong River Commission
MCS	monitoring, control and surveillance
MMPA	The Marine Mammal Protection Act (USA)
MPA	Marine protected area
MSC	Marine Stewardship Council
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
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	
SEAFDEC	Southeast Asian Fisheries Development Center
TAC	total allowable catches
TCP	Technical Cooperation Programme
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 (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.

BACKGROUND TO THE SIXTH APFIC REGIONAL CONSULTATIVE FORUM MEETING

The Sixth Asia-Pacific Fishery Commission (APFIC) Regional Consultative Forum Meeting, ***"Promoting blue growth in fisheries and aquaculture in the Asia-Pacific"*** was convened at the Taj Samudra Hotel in Colombo, Sri Lanka, 8-10 February 2016.

The Meeting was attended by 54 participants from 15 countries and representatives from 9 regional partner organizations and projects. The Meeting was hosted by the Ministry of Fisheries and Aquatic Resources Development, Government of Sri Lanka together with the Food and Agriculture Organization of the United Nations (FAO) and Asia-Pacific Fishery Commission (APFIC).

This Sixth APFIC RCFM was held to precede the Thirty-fourth Session of APFIC and acted as a regional briefing on the activities of the Commission and her 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 for presentation to the APFIC Thirty-fourth Session with respect to Blue Growth. The thematic sessions were:

- Regional overview of Blue Growth in Fisheries and Aquaculture including the FAO Blue Growth Initiative (BGI).
- Country and regional initiatives on Blue Growth approaches inland & marine fisheries
- Blue Growth in Asian aquaculture
- Country & 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 provide 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 Sixth APFIC Regional Consultative Forum Meeting (6th RCFM), *"Promoting blue growth in fisheries and aquaculture in the Asia-Pacific" was convened at the Taj Samudra Hotel in Colombo, Sri Lanka, 8-10 February 2016.* The meeting was attended by 54 participants from 15 countries and representatives from 9 regional partner organizations and projects. The meeting was hosted by the Ministry of Fisheries and Aquaculture Resource Development, Government of Sri Lanka together with the Food and Agriculture Organization of the United Nations (FAO) and Asia-Pacific Fishery Commission (APFIC).

The APFIC Chair, Ms. W.M.M.R. Adikari, Secretary, Ministry of Fisheries and Aquatic Resources development, Secretary Ministry 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 propriety 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 international objectives including implementation of the 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 all heads of department and organizations that participated.

Mr Simon FungeSmith, Secretary of APFIC welcomed participants to the 6th RCFM. He outlined how the RCFM was organized to precede the Session of the Commission and is intended to provide a more open discussion and to explore 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 have time for participants to work together to reach 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 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. He also like to thank 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 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. 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 the opportunities to increase the pace of development of sustainable fisheries and responsible aquaculture in the region. She outlined that for those who may be new to the concept of Blue Growth there will be a broad overview 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 is core is the promotion and implementation of the FAO Code of Conduct for Responsible Fisheries. The Forum is also tasked with developing recommendations which will be presented to the 34th Session of the Commission for its consideration. She outlined the importance of APFIC as a neutral forum which strove 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 have so enthusiastically contributed to organization and convening of this

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 around 48 million (87 percent of 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 worlds fishing fleet is from Asia (73% 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 the benefits are sustained. The key contributions can be through that to 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, amongst 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 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 mostly negative some opportunities with emerging new fisheries as a result of shifting stocks.

"Blue Growth" approaches have emerged from the Rio+20 calls 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 "Blue Growth" initiative (BGI) assists countries in developing and implementing blue economy and growth agendas. It builds on the FAO Code of Conduct for Responsible Fisheries, adopts the use of ecosystem approaches to planning and management of fisheries and aquaculture, is climate smart, ensures responsible investment and contributes to the achievements of the SDG's. The FAO Blue growth initiative goal 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 though adopting 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 through addressing specific issues (such as bycatch), improve coastal habitats and protect critical areas. FAO's BGI supports countries in addressing IUU fishing (which is undermining management) through capacity development, strengthening of regional cooperation, implementation of PSMA, national MCS, vessel registration and inspections for safety and seaworthiness. BGI also supports small-scale fisheries and aims to create a space where they can operate (with a focus on rights) through strengthening fishers 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 to secure the interests and rights to management and utilization of fisheries resources, strengthening community based fisheries management approaches and improving understanding and agreement of how to fish water bodies can be utilized sustainably. 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. BGI adds value to water through engaging with the water management sector to help them understand possible win-win outcomes (such as better watershed management, water quality and maintaining minimum critical flows to sustain fish productivity).

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/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.

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

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% when both primary and secondary sector are considered. BGI supports the role of women by encouraging efficient seafood value chains and improving livelihoods and decent work conditions, especially for women and youth.

A key objective of the BGI is to develop capacity to drive "blue growth" through developing pilot approaches to promote innovations, encouraging investment, removing barriers, increasing awareness of BGI potential, reducing risks and investing in knowledge and learning. Training and capacity building is required for BGI implementation.

THE NEED AND OPPORTUNITIES FOR BLUE GROWTH IN AQUACULTURE IN THE ASIA-PACIFIC

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 % of global production). The region produced 62.1 million tonnes of aquaculture products (excluding aquatic plants) in 2013. These had an estimated value of 115.76 billion USD (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% 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 come from aquaculture by. 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 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 feeds and these presents resource challenges particularly

linkage source of fishmeal. This intensification has also resulted in environmental & disease challenges driven by overcrowding and the limitations of environmental carrying capacity.

A major threat to aquaculture in the region are the impacts of Climate Change. Tropical floodplains, mountainous areas, low-lying small island developing countries and in the tropical deltas are all vulnerable. Impacts will be excessive rainfall, cyclones , flooding, rising sea levels and 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 loss of revenue, stock and damage to farm infrastructure Although most impacts are generally considered to be negative, there may be some opportunities enabling culture of new species

The FAO Blue growth Initiative (BGI)in aquaculture aims to support countries achieve a balance between healthy aquatic ecosystems and sustainable growth in production. Blue Growth Initiative (BGI) in aquaculture is a combination of strategies aimed at policy and institutional reform , on the ground action and implementation of the FAO Code of Conduct for Responsible Fisheries through use of ecosystem approaches to planning and management. BGI also delivers the SDG's 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 through 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 through seeking out "blue investments" and building a better understanding of supply and demand. It improves access to markets by harnessing Information technology (via e-documentation, traceability and cold chain assurance), certification/labelling and improves 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 require specific infrastructure. High relative economic returns can for example be generated from systems with lower footprints (omnivorous finfish, mussels & seaweeds). 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 improvements, health (high health, SPF) and exploration of new species for culture. Innovations in feeds and feeding also include automation, IT to improve feeding efficiency, improving performance of feeds (especially for omnivorous and herbivorous species) and reducing the dependence upon fish meal. 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 FAO Regional Blue Growth Initiative has a goal "***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 socioeconomic development in the Asia Pacific Region. The major areas of work of the FAO Regional BGI include:

- Identification of options to address key governance constraints to sustainable aquaculture growth
- Increasing farmers' 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
- Improvement of access to quality production inputs by poor rural aquaculture farmers

- Improvement of management of forestry (mangrove), water, land and tenure to contribute to sustainable intensification

The FAO Blue Growth Initiative in Aquaculture Regional Initiative is supporting 6 focus countries (Bangladesh, Indonesia, Philippines, Sri Lanka, Timor Leste, Viet Nam) through 4 full TCP projects, 5 TCPF projects, 2 GCP projects and 1 MDF supported project. At a regional level it is supported by a Regional TCP (aquaculture management) for selected ASEAN members approved and an innovative rice-fish farming in Asia-Pacific meeting has been convened along with training on small-scale aquaponics conducted

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 Asian 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 Asian 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 that form the basis of 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 (RFMO) 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 which 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
- Are areas that are relatively long distances 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 USD3 055 million to USD5 235 million (USD3.06 billion to USD5.24

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) totaling USD2 393 million to USD4 146 million. 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 USD482 million to USD836 million (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 (USD181 million to USD253 million).

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 figure from 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. More probable however is that the majority of IUU fishing in this area is conducted by domestic vessels. 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 are focused 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 transshipment; 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 THE 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 as 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. IUU fishing may be undertaken by large-scale vessels or small-scale vessels, but it is notable that the majority of volume and value of IUU catch is by the former. 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

Outdated legal frameworks: The fishery legal frameworks in many countries have not kept up-to-date with the rapid evolution of fisheries, in particular, 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 along 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 VMS in the subregion is almost exclusively applied to very large vessels. In addition, VMS systems 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 an effective 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 a 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 between countries to maintain cordial relations with their neighbouring. 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 transshipment 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.

Transshipment: Transshipment 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 transship catches of domestic fishing vessels according to the existing laws and fisheries management agencies should consider including transshipment 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 transshipments 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 transshipment.

Endangered, threatened or protected (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. Transshipment 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 /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/transshipment). 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 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 favor 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 terms.

IMPROVING FISHERIES MANAGEMENT AND REDUCTION OF ECOSYSTEM IMPACTS IN MALAYSIA

Ms Hemalatha Raja Sekaran, Malaysia

Malaysia has been implementing various programs and activities, aiming at improving fisheries management as well as reducing ecosystem impacts to ensure sustainability. One (1) of the important initiative includes implementation of Ecosystem Approach to Fisheries Management (EAFM) at five (5) states in **M**alaysia, namely Sabah, Sarawak, Perak, Selangor, and Kedah. Besides establishing pilot sites, Malaysia also continues providing 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 Illegal, Unreported, and Unregulated Fishing which are implemented in ensuring proper management of fisheries resources. In combating IUU fishing, Malaysia actively cooperates at regional and international level through information sharing in particular under the RPOA-IUU arrangement . Moreover, Malaysia also provides capacity building pertaining to Port State Measures (PSM) and joins trainings provided by other International Organizations to make sure its preparedness towards the implementation of PSM. As Malaysia exports fish and fishery products to EU, the implementation of catch certiticate prescribed under EC Regulations 1005/2008 has been instrumental to ensure smooth flow of trade.

INCREASING THE PRODUCTIVITY OF MAN-MADE WATER BODIES

Mr. Thay Somony, Cambodia This abstract is taken from Strategic Planning Framework for Fisheries in Cambodia (2015-2024) of Fisheries Administration.

Fisheries is one of the most important sectors to the lives and livelihoods of people in Cambodia. In order to maximise, and to ensure the sustainability of, the contribution of the fisheries sector to national development, the Strategic Planning Framework (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 and which released a further 80 fishing lots to small-scale fisheries and conservation areas. These changes, along with those associated with wider climatic changes, expansion of hydro-power, changing international obligations and increasing emphasis on the rights of women, the young and the poor in the development process, need to be accommodated in 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. It outlines the key elements of the strategic approach according to four development pillars for the sector: 1) Capture fisheries[1] 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 includes 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 (PICES-MARWEB PROJECT IN INDONESIA) - A GOOD RELATIONSHIP BETWEEN LOCAL COMMUNITIES AND SEAFOOD DIVERSITY

Masahito Hirota1, Mark L. Wells2 and Mitsutaku Makino1

1.National Research Institute of Fisheries Science, Fisheries Research Agency, 2-12-4 Fukuura, Kanazawa, Yokohama, 236-8646, Japan mmhirota@affrc.go.jp

2.School of Marine Sciences University of Maine, 5741 Libby Hall Orono , ME U.S.A. 04469

Shrimp pond cultures have been widely developed since the 1980s in South East Asian countries. But after 2000s, the abandonment due to mass diseases have resulted in a threat to 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 pond experiment of IMTA (A method of aquaculture in which fish, scallop and seaweed are managed tropically by bio-recycling so that the by-products from one species are used as food or fertilizer for another).

Another one is social science approach, using a commodity chain analysis of the products, to assess what kind of businesses can support local community people, who and how consume the multi-species produced (shrimps, milkfish, crab, etc.) to ensure a rich variety of seafood as ingredients of everyday life, and to lead new diverse job creations in the community.

To understand this sustainability 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 programs in order to rectify their own well-being.

This research is a part of a 5-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). And we think that it will lead the next step along with the Blue growth concept.

OVERVIEW OF THREE MAJOR US "BLUE GROWTH" INITIATIVES IN 2015

Mr. Michael Abbey, USA

United States' Efforts in 2015 to Promote Blue Growth through Promoting Domestic Aquaculture and Mitigating IUU and Seafood Fraud

The United States 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 U.S. 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 if its recommendations. In the domestic aquaculture news, NOAA published a final rule implementing our nation's first regional regulatory program for offshore aquaculture in federal waters. In doing so, NOAA is expanding opportunities for U.S. seafood farming in the open ocean.

Presidential initiative on IUU fishing and seafood fraud

As a global leader in sustainable seafood as well as an importer of up to 90% 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 programs 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 Committee on IUU Fishing and Seafood Fraud (NOC Committee) 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 Monitoring, Control, and Surveillance (MCS) tools and create and expand partnerships with non-U.S. government federal entities to identify and eliminate seafood fraud and the sale of IUU seafood products in U.S. 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 program which will track domestic and imported seafood products from harvest or production to the point of entry into U.S. commerce. This program will be phased in by species with significant risk of IUU fishing in their global supply chain and aims to help prevent entry of illegal seafood product in U.S. commerce.

A proposed rule of the U.S. traceability program 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 program 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 U.S. aquaculture currently accounts for 20 percent of the value of domestic fishery landings, U.S. 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 U.S. seafood farming in the open ocean. NOAA and our partners are working to advance and expand U.S. aquaculture, as a complement to wild harvests, to keep our 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.

The new rule authorizes NOAA Fisheries to issue permits to grow species such as red drum, cobia, and almaco jack in federal waters in the Gulf for an initial period of 10 years.

Marine Mammals

The Marine Mammal Protection Act (MMPA) of the United States prohibits, with certain exceptions, the "take" of marine mammals in U.S. waters and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the U.S.

NOAA today issued a rule that will require U.S. trading partners 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 U.S. standards. These proposed regulations would establish conditions for evaluating a harvesting nation's regulatory program 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 5-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 U.S. standards. Nations not in compliance following this period face possible U.S. 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

Mr 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 perenial and seasonal reservoirs has become a biggest 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 programs and 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 was increased to 75,750 Mt. Establishment of 05 water based mini hatcheries in 05 reservoirs on pilot scale; Development of culture based fisheries in lagoons; Development of culture based fisheries in Villues; Establishment of barricade to prevent fish loss and to ensure fish seed containment during flood time; Rehabilitation of reservoirs and fish restocking will be carried out to expand the culture based fisheries in Sri Lanka. 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 was focused on community based seed production schemes that will produce advance fingerlings. Lack of proper genetic improvement programme for quality broodstock is a major issue and to overcome this capacity building on fish genetics and broodstock management, formulation of BMPs and guidelines, implementation of separate genetic improvement programme were 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 NWP had been affected by the outbreak of diseases severely in year 2004. After implementing several activities, Shrimp production of NWP is sustained at the level of 5000Mt per annum at present. Expansion of shrimp farming into district of batticaloa also commenced and however, shrimp production in 2015 is around 6500 Mt in both puttalam and Batticaloa Districts. To promote and expand the shrimp and coastal aquaculture, Marine fin fish hatchery, Batticaloa and Aquaculture industrial parks in Batticaloa and Mannar will be established. And also Draft National Action plan was prepared to prevent EMS disease to Sri Lanka. Strategic plan has been prepared for aquaculture value chain development and Master plan for development of aquaculture will be prepared.

PRECAUTIONARY APPROACH TO SUSTAINABLE GROWTH OF MARINE FISHERIES RESOURCES IN THE BAY OF BENGAL: BANGLADESH PERSPECTIVE

Mr Nasiruddin Md Humayun, Bangladesh

Bangladesh established her legitimate right into 118,813 sq.km area of the Bay of Bengal resolving dispute over maritime boundary with Myanmar and India during 2012 and 2014 respectively settled by International Tribunal on the Law of the Sea (ITLOS) and International Court of Arbitrations. This verdict ensures the sovereign right to explore, exploit and manage living and non-living resources in the EEZ and ABNJ. Bangladesh being a pilot nation included in the blue growth initiative of FAO and also a priority area by the Government of Bangladesh to strengthen its Blue Economy various pragmatic initiatives especially conservation measures are being implemented to harness maximum sustainable yield (MSY). Currently, the industrial fishing fleet comprised of 246 trawlers of varied capacity and types mostly involved fishing operation within 100m depth contour in the continental slope. Besides, about 32 thousand mechanized boats engaged fishing into the coastal and offshore water within the EEZ. Both industrial and small scale fisheries ventures should comply with relevant National Fisheries Acts and Regulations. For Sustainability of Marine Fisheries Resources, several precautionary approaches being grounded, notably included are: Prepared the draft of the National Marine Fisheries Policy consulted to 28 pertinent maritime agencies; conversion of existing bottom water trawler to eco-friendly mid-water ones; moratorium imposed on sanctioning new trawlers for fishing below 200m depth; banned replacement of trawlers in lieu of older one to restrict overcapacity; promote fishing in distant and deep waters beyond 200 m and ABNJ introducing long liner; exploring new fishing method and areas; establishing marine reserves, sanctuaries and marine protected areas; strengthened comprehensive effort to bring all mechanized fishing boats under licensing scheme; declared season closer banning all types of fishing by industrial trawler for 80 days; initiated program to eliminate all types of destructive fishing gear like-estuarine set bag net (ESBN), 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. In order to explore and exploit large pelagic from deeper water beyond 200m depth introduction of long liner to existing fleet is progressed. To build capacity and entering global market, Bangladesh already got the status of Co-operation Non-Contracting Party (CNCP) of 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 could be shared.

1. Incentive Based Hilsa Fishery Management in Bangladesh: An Initiative to Blue Growth

2. Precautionary Approach to Sustainable growth of Marine Fisheries Resources in the Bay of Bangal: Bangladesh Perspective

DEVELOPING AN IMPLEMENTATION STRATEGY FOR FISHERIES AND AQUACULTURE MANAGEMENT AND DEVELOPMENT IN 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 over 40% of the animal protein consumed in the Lao diet comes from fish and others aquatic animals such as frogs, craps and snails. In 2013, the Government of Laos (GOL) started a project with support from the Food and Agriculture Organization of the United Nations (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 Laos, 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 fisheries sector; it is critical there is adequate capacity exist 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 the capacity of national level and provincial DLF staff to interpret and implement government policies and strategies for the sector.

DLF/FAO partnership to develop an Implementation Strategy for Capture Fisheries & Aquaculture Management & Development in Lao PDR by 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 in the aquatic resources sector throughout the country and participants discussed ways in which current government policies, strategies and targets could be particularly implemented. Identified way in which collaboration between different government agencies and other stakeholders could be improved, particularly in relation to the management and development of reservoirs (irrigation & hydropower) was an important topic in these discussions. The agreements and conclusions reached during these consultations have been summarized by DLF and the team of National experts as a Strategy Implementation Plan (SIP) for aquatic resources sector. The document has been developed as a 'Handbook' that contains guidelines, advice and other relevant information, which target mainly DLF provincial staff and aim to help them turn government strategy to practical local action. Key guidance included in the SIP aim to improve provincial planning, improve 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, Nepal , Program Director, Directorate of Fisheries Development, Nepal

Aquaculture in Nepal is rapidly growing. The growth rate of aquaculture sector was 6.95% before launching of "Fish Mission" program. This approach has helped to achieve an average growth rate of 8.5% since last seven years. However there is an increasing trend of import with a volume of nearly 12000 metric tons and value of nearly 15 million USD. The capture fisheries is under constant threat and maintaining current production level is a great challenge. Therefore, the increased demand for fish has to be obtained through increasing aquaculture production. The contribution of aquaculture to total fish production in the country is increasing day by day and has reached 69%. Still per capita availability is only 2.5 kg. Country is aiming to increase per capita to 10 kg in next fifteen years from now 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 unutilized water bodies and Vertical expansion is aimed at species diversification and intensification through mechanization.

The annual growth rate necesary to achieve the set target is over 16%. There is a potential to accelerate the growth which has been proved by the initiation of Fish mission program. The learning from that program is increased government investment has attracted the private sector investment resulting in increased growth. Better conducive policy, investment environment,

increased Government involvement through technical and financial assistance and support are believed to help in achieving the set target.

Nepal has just declared the "Agriculture development strategy" for next 20 years. The strategy aims to increase land and labor productivity along with competitive and commercial production. The recent strategy to attract private sector and make agriculture production competitive. The soft loan for farmers with 4% interest subsidy, attractive insurance policy and 75% subsidy on insurance premium are some of the conducive policy by Government.

From this year Government has developed a strategies to attract private sector investment. Some of them are;

- Soft loan: farmers need to pay only 5-6 % interest as 4% interest subsidy is provided by Government.
- Favorable and subsidized Insurance policy: Aquaculture insurance is considered to be best among agriculture commodities as Fish farmers need to pay only 2% premium compared to 5% for rest of agricultural commodities of which 75% subsidy is covered by Government. The other highlights of fish insurance policy is farmers can choose the package whether they want insurance coverage based on production cost or product value. In addition the aquaculture facilities can also be insured with additional 1% premium.
- Support for aquaculture facility development: 25-50% subsidy on construction of new aquaculture facilities (pond construction, raceway construction, hatchery establishment, Nursery establishment etc.). However, it should be within the stipulated budgetary allocation.
- Subsidy on machineries: 50% subsidy is provided on machineries specified for aquaculture development.
- Special packages for species diversification (hatchery establishment and demonstrations).
- Special program package for hills and mountains.
- Regional balance through project support.
- Customs and tax relaxations on aquaculture tools and equipment.
- Improved seed and feed supply system is in development process.

These strategies are working efficiently as it has attracted new entrepreneurs from various walks of life. The impact is also quite satisfactory as a total support of 5 million USD has not only insured annual additional national income by more than 60 million USD but also has attracted around 30 million USD last year(6 times) from the private sector. This year initial trend show still better performance. Therefore, the current strategies and support program needs to be continued to achieve address the issues of Nutritional security, Trade deficit, Regional dis-balance, Increased land and labor productivity and Increased Income and better livelihood and also to meet national target and sustainable aquaculture development in Nepal.

STATUS OF BLUE GROWTH IN FISHERIES & AQUACULTURE IN PAKISTAN WITH SPECIAL EMPHASIS ON REDUCED DEPENDENCE ON IMPORTED FISH PRODUCTS AND IMPROVE CONTRIBUTION ON DOMESTIC FISHERIES PRODUCT TO PROVIDING HEALTHY DIETS

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

Fishery plays an important role in the national economy as it is not only employ about 1.0 million people in coastal area and along the banks of large rivers, dams, reservoirs and other water bodies but also an important source of foreign exchange earnings for the country. One of the important contributions of fishery sector of the country is to provide high quality protein to this malnourished nation. Fish is also staple diet for coastal communities whose livelihood depends on the fishing. Present annual production of fish and fishery products is estimated to be 650,000 m. tons which include 250,000 m. tons of freshwater fish which is mainly produced through aquaculture. Of these about 130,000 m. tons is annually exported from Pakistan whereas the remaining fish is consumed directly or indirectly, as a substantially large quantity of fish is converted into fish meal for local poultry industry. Poultry fed on locally produced fish meal is also consumed; therefore, this fish is also indirectly consumed locally.

Import of fish for local consumption started about 20 years back when large size rohu carp (Labeo rohita MMK) was imported from Myanmar and marketed in 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 per kg. This created a demand for imported rohu in Punjab and at one time (between 2002 to 2006) about 3,000 m. tons of rohu was annually imported from Myanmar. Government agencies could not cope with the situation. Rather than taking steps for reducing the cost of production of locally produced rohu. Small qualities of rohu is still imported from Myanmar and Bangladesh.

During past one decade important of Pangasius fillets from Vietnam started to find its way into 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 m. tons of Pangasius fillets were imported from Vietnam which gradually increased. It is estimated that since 2012 about 15,000 m. tons of Pangasius fillets are imported in Pakistan. Initially these fillets used to have only 10 % glazing (with water) but to keep the prices on lower side Pakistan importers have ordered its Vietnamese suppliers to increase glazing to about 40 %. This ultimately fire backed, consumers started realizing that they are paying extra prices for the water instead of fish. Simultaneously Vietnamese authorities consider this to be against the business ethics, therefore, it is now mandatory to have a level of glazing lower than 10 %. As a result, the prices of Pangasius has increased substantially (Rs 450 to 500/kg as compared to previous rate of Rs 250 to 300/kg in retails).

Although the demand for Pangasius fillet is now decreasing, still it is generally like because of its bland taste, bone free, ready for cooking and round the year availability (at least in super stores). Demand for local fish including fish fillet is increasing in Pakistan. Media has played a key role in increasing the demand of local fish varieties. A number of TV and radio programmes keep on mentioning about local varieties of fishes in their cooking and other programmes, therefore, now demand of local variety of fish showing an increasing trend.

Government of Pakistan through Marine Fisheries Department has implemented a project on "Fish Marketing and Utilization" in late 1980's and early 1990's which was aimed to increase utilization of the 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 Fisheries Development Board (operating under Ministry of Food Security and Research) a modest processing facility for fish has been established at Islamabad which is showing promising results as a number of variety of fishes such as tilapia is now 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 hyper-stores in the country has also helped in 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 getting popular. A number of value added products are also available at these outlets which is increasing the demand of domestic fish in Pakistan MMK.

REGIONAL EXAMPLES OF BLUE GROWTH APPROACHES IN INALND AND MARINE FISHERIES

SCOPE AND PRACTICE OF FISHERIES CO-MANAGEMENT APPROACHES IN SACEP REGION

Mr Pulakesh Mondal, SACEP Senior Programme Officer (Regional), South Asia Cooperative Environment Programme, 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 recognized that fisheries is the important contributors to the national economies of some Asia Pacific member 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 producer which is presently stands fourth in producing inland water fish 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. Conventional fisheries management approach has been widely called part of the problem rather than of the solution of resource exploitation and management. Ineffective centralized fisheries management is the need to change the structure of governance. Fishers can no longer depend on government to solve their problem. The crisis in fisheries and coastal community is pressuring national governments to look for alternative management strategies. Earlier, public fisheries sectors were managed though leasing system or by the fisheries agencies to take full responsibility of managing the resources in some Asian countries. Co-management in fisheries comes as the approach that allows fishers to fully participate in a shared decision-making process with fisheries agencies, for the sustainable management of fisheries resources, though it is slight differences in different countries. More attention should be given to fishers and fisher communities to enhance their full participation in the management of the fisheries resources.

Bangladesh, India, Pakistan and Sri Lanka are the leading countries in South Asian Region in coastal and inland fisheries sector. These countries are also very rich in public inland and coastal water bodies which is the important fisheries sector of these countries. In Bangladesh, lakes, canals, rivers and estuaries covering an area of 4.56 million ha (DoF, 2005). Inland fisheries development activities in Sri Lanka began in early twentieth century and total inland water bodies in Sri Lanka is 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 where they inhabit. Tamil Nadu, Andhra Pradesh, Orissa, West Bengal, Gujrat, Maharashtra, Karnataka and Kerala are very rich in inland fishers comprises rivers, canals, lakes, wetlands, pond and estuary (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 covered by fish ponds across all provinces is about 60 470 ha and about 110 000 ha comprise the warm water natural lakes (FAO).

The implementation of co-management is costly, complex and long and it will not necessarily work in every community. South Asian Countries are practicing fisheries co-management and have many successful stories for sustainable fisheries management. These region also have huge scope and potentials to practice co-management strategy in the 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 BOBP-IGO, Director, Bay of Bengal Programme Inter-Governmental Organisation .

Information and Knowledge are integral part of ensuring in fisheries. The 1995 Code of Conduct for Responsible Fisheries reflects this need quite clearly and lays heavy importance on scientific evidences, traditional knowledge and access to information and knowledge. To start with, a knowledge management framework (KMF) can be thought of as a framework for managing information and explicit knowledge (e.g. research work, etc.) so as to ensure informed stakeholder; evidence-based management and 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 the Food and Agriculture Organization (FAO) of the United Nations, BOBP since 1979 captured both folk and expert knowledge in 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, took a major programme of mapping fish markets in its member-countries (http://bobpigo.org/html_site/fishmarket/index.htm). The fish markets are nerve centres in fisheries supply chain with both upward and downward linkages. By inventorying these markets, better interventions can 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 crafts. The application will further strengthen the ongoing programme in Bangladesh to strengthen its Monitoring, Control and Surveillance regime. The BOBP-IGO in association with the Bay of Bengal Large Marine Ecosystem (BOBLME) Project also digitally archived over 50 000 images dating from 1979-2015. This digital archive tells its own story of fisheries development in the Bay of Bengal region and also for areas outsides the Bay. The latest initiative in KM in the region is happening in Tamil Nadu and Puducherry, India. The BOBP-IGO has proposed an IT enabled hub and spoke model of 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 need sustained internal and external support to develop. However, it is expected that as countries are moving towards ecosystem approach to fisheries, the framework in place will provide the initial support and evolve itself with new developments.

FISHERIES IN THE LOWER MEKONG BASIN: AN UPDATE

Mr Ngor Peng Bun, MRC, MRC Fisheries Team, Phnom Penh, Cambodia

Inland fisheries of the Mekong River Basin are amongst the largest fisheries in the world. Over 1,000 fish species are estimated in the basin, of which about 877 freshwater fish species have been recorded. The 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 to US$17.0 billion; about US$11 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, Bargridae and Siluridae made up of around 90% of the catch, of which about 80% was from Cyprinidae alone. Catch rate trends in the lower Mekong mainstream, the 3-S Rivers (Sekong, Sesan, Sprepork) and Tonle Sap River of Cambodia as well as in Viet Nam Mekong Delta tend to decrease over time especially during the last five years. However, catch rates reported in 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, WWF

The Coral Triangle Initiative, a regional cooperative agreement of the six governments including Indonesia, Malaysia, The 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 provoded 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 WWW coral triangle program, share the experiences and lesson learned in the engaging primarily with the business sector in promoting the WWF principles of a 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 REBYC-II CTI and Southeast Asian Fisheries Development Center (SEAFDEC)

Project GCP/RAS/269/GFF Strategies for Trawl Fisheries Bycatch Management (REBYC-II CTI) has been developed base 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 by trawl fisheries. Specific technologies and practices will be identified to support the development of management plans in partnership with relevant organization, e.g. FAO/APFIC, BOBLME, SIDA and etc, including with private sectors at both national and regional levels. Project planning and implementation is structured around four (4) main interrelated components i.e. 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 (5) countries, namely, Indonesia, Papua New Guinea, Philippines, Thailand, and Viet Nam are participating in the project. The Southeast Asian Fisheries Development Center (SEAFDEC) as Regional Facilitation Unit (RFU), based in Samutprakarn, Thailand, is responsible for supporting the participating countries for planning and implementation.

Strengthened on concept of Ecosystem Approach to Fisheries Management, the foreseen result of the five (5) years project implementation shows the improvement of trawl fisheries management

in pilot size of west Samar Sea of Philippines, Gulf of Papua New Guinea, Kien Giang Province of Viet Nam. Project also technical supports to the formulation of fisheries management of Thailand and implementing of Arafura Sea Fisheries Management Plan of Indonesia.

ENHANCING CAPACITIES OF FISHING COMMUNITIES THROUGH IMPLEMENTATION OF FAO-VGSSF

Mr Vivekanandan Vriddagiri, ICSF

The "Blue Growth" concept of the FAO appears to provide a new meta-framework that integrates the various concepts and frameworks like the CCRF and EAF that the FAO has already promoted over the last 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 between the various frameworks that the FAO has been promoting. More importantly, it appears to provide a new packaging and branding that provide 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 Voluntary Guidelines for Sustainable Small Scale Fisheries (VGSSF), or the other way around. As an important partner to the 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 fishermen. Given that the largest numbers of fishers are in the Asia Pacific region, the implications of blue growth are even more important in 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, 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 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

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 (JTF), includes the Promotion of Fishing License, Boats Registration, 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 meters in length and over during its first phase, and to be expanded later with the recording of vessels measuring less than 24 meters. Through this project, SEAFDEC has been extending assistance to the countries in the region in their endeavors of improving 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 vessels record together with the refined fishing licensing systems could be effectively used as fisheries management tools in combating IUU fishing in the Southeast Asian region.

Despite the increasing demand for fish and fishery products in view of their importance to human wellbeing, 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 tons of greenhouse gas emissions for every 1.0 ton of live-weight seafood, and is responsible for over 1% 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 Thai commercial fishing industry. The project was aimed at evaluating fuel consumption in single-boat trawl fleet and identifying potential fuel savings through energy efficient fishing operations and practices. This Project also applied energy audits to trawlers in single-boat trawl fleet. It is envisioned that results of this pilot project could also be adapted in other countries of Southeast Asia to ensure that trawl fisheries is not only cost-effective but also environmentally efficient.

BLUE GROWTH IN ASIAN AQUACULTURE

AQUACULTURE OF PANGASIUS IN VIETNAM AS AN ALTERNATIVE SUSTAINABLE FOOD SOURCE

Ms Nguyen Thi Hong Nhung Vietnam Fisheries Administration, Viet Nam

Aquaculture in Vietnam contributed 57.42% of total fisheries production in 2014 with estimated at 3.620 million Metric Tonnes. The area of aquaculture farms covered 1.280 million ha, increased by 8.4% compare to the year 2013. Out of the total, Pangasius aquaculture production contributed 20%, while shrimps contributed 50%, in 2014. Pangasius has been culture widely in 11 provinces of Vietnam's Lower Mekong area, estimated at 5,550 hectares in 2014. The production recorded a total of 1.116 million metric tones. Total exports of Pangasius products estimated at USD1.76 billion in 2014, concentrating at EU market. Although, slightly decreased in four major markets, namely EU, USA, ASEAN and Other Category Countries, Pangasius export still maintained robust for the world consumption. Consumers and market concerns on environment and ecology protection, traceability, food safety assurance, fish health & welfare and Social Responsibility have been address through government interventions by strict standards, international standard compliance and law and enforcement placement. These interventions are assurance to consumers and markets on the quality and safety of Pangasius produced. It is Vietnam 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 source 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 the 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 as follows:

- 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 private sector
- Create employment and alternative livelihood opportunities in the country, particularly in the outer atolls
- Create 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/ small scale operators, greater gender involvement, less risks involved as each operation is independent of the other when compared with a vertically integrated system.

The commodities to be encouraged immediate 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 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 aquacultured 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, maricuture 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 in 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 National Centre for Aquaculture (The then National Warm Water Fish Culture Centre, NWWFCC) Gelephu during 1982. From the year of 1990, many obstacle hindered to its smooth path till 2003, making the sector complete paralyzed. However, after the situation brought into normal in 2003, for 2005 the sector revived back with its activities and moving to its present path, therefore, the Bhutanese aquaculture is still in its infancy stage. Import figure of both fresh and value added fish and fish product from outside has been skyrocketed making the huge out flow of financial resources continuously, therefore, since the recent decades, The Royal Government of Bhutan is focusing in the sector with the many strategies and initiatives, such as;

- Undertake research to develop aquacultural technologies, such as farming of food fish and breeding of ornamental fish, toward enhancing Bhutan's food security and as an option to secure livelihood, especially by Bhutan's rural populace;
- Disseminate aquacultural technologies;
- Support the adoption of aquacultural technologies by Bhutanese;
- Provide technical support to existing Bhutanese aquaculturists;
- Support the development and conduct of aquaculture ancillary activities;
- Directly conduct special aquacultural activities such as establishment of government mega fish farms for reduction of fish import;
- Engage as a collaborator in efforts to conserve and develop native fisheries such as the
- endangered Golden Mahaseer; and
- Support the formulation and development of national fisheries and aquacultural policies

MYANMAR'S BLUE GROWTH APPROACHES IN AQUACULTURE

Dr Aung Naing Oo, Myanmar, 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 semi-intensive culture system in some scale since last decade, it encountered with constraints such as outbreak of diseases, local availability of cost- effective quality shrimp feeds and poor development of infrastructures including electricity, freshwater availability, road access to market etc for sustainable development of shrimp aquaculture. In recent years, the development of shrimp culture in Myanmar is being improved by increase availability of shrimp seeds at local area due to increase development of infrastructures such as electricity, road access in coastal areas especially Rakhine State where is the most shrimp cultured places in Myanmar.

Penaeus monodon has been initiated since early 1980 practicing trap and hold method particularly in western coastal area. Natural post larvae of P.monodon were trapped into the pond during the high tide period through sluice gates. In the year 2002, a pilot demonstration on Environment Friendly Shrimp Aquaculture was conducted semi-intensive technique through collaboration with DOF and SEAFDEC-AQD. In the recent years, Myanmar has three types of shrimp farming: Semi-intensive 1774 ha, extensive 37155 ha and traditional trap and hold 53496 ha total 924428 ha. That means 50% of shrimp ponds are traditional method and low production were gained. Myanmar needs to improve traditional method to extensive plus or semi-intensive method in shrimp culture. Penaeus vannamei has many advantageous factors for culture but it may also cause the negative impact to other shrimp aquaculture industry. In marine fish farming, seabass, red snapper and grouper are the most common and commercial species in Myanmar. The seed production of seabass has been succeeding since 2006 in DOF. Myanmar needs the breeding technique for others commercial marine fishes. Some others marine species were success in experimental scale in farming, such as oysters, clam, seaweeds, molluscs. The groupers culture has been started since 2005 by private sector at Southern Region of Myanmar, however the poor development grouper hatchery technology is the bottleneck for development of grouper culture in Myanmar. Mud crab seed production technology also needed in Myanmar. Mud crab fattening (Soft-shelled crab farming) has become the booming industry in Myanmar and export demands are also growing rapidly. Soft shell mud crab farming has become very popular in Myanmar. Myanmar has been faced of the supply of crab juveniles from nature is decreasing due to over exploitation, habitat deterioration and climate change. Myanmar DOF encourages expanding of the development of marine and coastal aquaculture at suitable areas by the technical assistants of partner institution, neighboring countries and regional organizations such as NACA and SEAFDEC-AQD. To achieve blue growth aquaculture in Myanmar, there needs to be fewer restriction 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 feed sector, greater development of “hard” infrastructure such as roads, electricity and “soft” infrastructure such as human capital, extension services (disease control) and public investments in seed production technologies for promising species.

BLUE GROWTH APPROACH IN AQUACULTURE IN THAILAND

Ms Jutarat Kittiwanich, Thailand

Aquaculture plays an increasingly important role in food security and the economics of Thailand. Aquaculture contributed around 35 % of the country’s total fish production in 2013. The total production from inland and coastal aquaculture were approximately 436,000 and 562,000 tonnes, respectively. Inland aquaculture are mainly for domestic consumption and 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 oyster) are mainly for domestic consumption.

Thailand Department of Fisheries under the Ministry of Aquaculture and Cooperatives is highly concern on more efficient and sustainable aquaculture growth. These include improving the utilization efficiency to aquaculture resources, reducing impact on the environment, increasing resilience of farmer, and improving the quality of life. In order to support the sustainable aquaculture growth, Thailand adopted good governance, site selection/zoning, and good management practice in farm to strengthen aquaculture management.

Several projects to be considered as blue growth approach in Thailand such as; 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 output, improve waste management and development of economically viable used of waste by-products, and 3) Farm demonstration on biological water treatment by using seaweeds in re-circulation system of white shrimp culture. The knowledge and technology were transferred to the farmer aims for responsible and sustainable of aquaculture in Thailand.

INTEGRATED ECONOMIC ZONE DEVELOPMENT BASED ON BLUE ECONOMY IN LOMBOK: AN IMPLEMENTATION OF REGIONAL INITIATIVE ON BLUE GROWTH IN INDONESIA

By Maskur Maskur, Dian Sukmawan (Directorate General of Aquaculture, 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 economic which has a tendency to be exploitative and destructive to the environment. Apart of poor waste management, nature depletion is also caused by over exploitation on the natural carrying capacity itself. This concept gives 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), more efficient and cleaner production system, producing more product in quantity and economical value, promoting innovative and creative technology, increasing work labour absorption, and providing extensive opportunities for creating more earnings to each contributor fairly.

The Ministry for Marine Affairs and Fisheries has been conducted programs in supporting the blue economy implementation 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 DG of Marines, Coastal and Small Islands); Aquaculture technology development to support blue economy implementation by Research and Development Agency; and Directorate General of Aquaculture has conducted pilot project showcase on aquaculture business such as Integrated Multi-Tropic Aquaculture (IMTA), seaweed, grouper and white shrimp culture. Furthermore, blue economy development, being in line with the blue growth concept of FAO.

In order to implement blue economy in more focus and confident pathway, MMAF has been working together with Food And Agriculture Organization (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 of which aims to bolster cohesive economic zone in enhancing aquaculture development on Blue Economy basis in Lombok by focusing on seaweed, grouper, and white shrimp (L. vanamei). However, due to limitation on the project budgeting, the project had only concentrate on seaweed and grouper. Those two focus were based on its resource availability and potential in West Nusa Tenggara province. Sea weed culture development has been applied using less advance technology, providing more labor absorption, and generating more derivative products. In addition, the business may be done in home industry scale and has a vast opportunity for domestic and overseas market. On the other hand, grouper was selected for its relatively economic value with considerable price both in domestic and overseas market.

The final output of this project is the detailed zoning plan guideline on blue economy based on aquaculture. The guideline comprises of zoning plan, carrying capacity, value chain analysis, business connectivity and infrastructure plan in Central and East Lombok Regencies. This guideline, henceforth, will become a basis on blue economy implementation by local government with the involvement of stakeholder, investor and financing institution as well as the continuous support from 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 guideline and to adopt it as a recommendation for policy advice substance.

FACILITATION OF BLUE GROWTH: REGIONAL COLLABORATION AND PARTNERSHIP FOR AQUACULTURE DEVELOPMENT IN ASIA-PACIFIC REGION

Mr Yuan Derun PhD, The Network of Aquaculture Centres in Asia-Pacific, P.O. Box 1040, Kasetsart Post Office, Bangkok 10903, Thailand, Email: yuan@enaca.org

The Network of Aquaculture Centres in Asia-Pacific was established on the principle that cooperation, partnership and sharing among member governments is a practical and cost-effective mean 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 nationally of priority and regionally relevant to promote sustainable growth of aquaculture. These issues include imperious need for production intensification to meet increasing seafood demand for growing population, negative impacts of the sector to 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 across member governments, development and dissemination of BMPs, and inclusion and empowerment of small scale farmers. This presentation summarizes NACA's experience in facilitation of blue growth in aquaculture in Asia-Pacific.

PROMOTING THE NATIONAL FISHERIES PRODCT STANDARD IN CAMBODIA FOR THE DRIED FISH "TREY NGEAT" AND FISH PASTE "PRAHOC"

Dr Kao Sochivi, Deputy Director General of Fisheries Administration (FiA), P.O. Box 582, #186, Norodom Blvd., Chamkamorn, Phnom Penh, Cambodia, Email: kaosochivi@yahoo.com

One of the four priority areas of the Royal Government of Cambodia (RGC) on 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 broader livestock farming and aquaculture through introduction of a policy framework based on value chain principle, and removing all the barriers to the development of this sector, taking into

account issues such as food safety standards and market regulation functions especially sanitary and phyto-sanitary standards. While the fisheries sector strategic plan for 10 years from 2015-2024 is being developed, and the fisheries sector also included the Fisheries value added as one pillar among the 4 pillars.

Cambodia is a country that people has relived of their livelihood is almost more than 6 million which equally to 45% of the total population and had consuming of fish in average more than 52.4kg/per/year and the remain of consuming, the raw fish, our people try to process in may form of the fish and fisheries products based on the traditional technology such as fermented fish, fish sauce, dried fish, fish cake, shrimp paste, dried shrimp, Frozen Shrimp, Dried squid, Dried fish, Fish paste...etc. Among many kinds of our traditional products, we have our own uniqueness product such as: Fish Paste (Prahoc) and Dried Fish (Trey Ngiet). Prahoc is a very important product for the Cambodia food as the ingredient and also as a direct cooking food, especially for the rural people within the peak season of wild fish harvesting every year between the months of open fishing season from November- December, they try to process for their home consumption need at least 50-100kg/family and also for their livelihood benefit too.

Due to the population increase and climate change impact from year to year, our wild fisheries production decline from year to year with a limit of knowledge of our processors, consumer and the relevant stakeholder and also based on the assessment and observation we can find out that our Prahoc and Dried Fish which we consume is has a very limited in term of the product quality, safety, packaging and access to market and it can cause to value fish and fisheries product loss and also the value of economy loss because of our uniqueness brand name which so far, we known that Prahoc is make in Siem Reap and another reasons, due to the limitation of this quality, safety and proper packaging, which lead our product cannot access to the other international market, so most of our uniqueness product was force to sell to our neighbors countries, mostly in form of semi-final product with a very low price is compare to the final product to neighboring countries such as Viet Nam and Thailand then they just re-processing and proper packaging with the brand name " Prahoc Siem Reap Made in Thailand" and export to other 3rd development countries with a very high price difference. The FiA need to take some intervention and strategy to response on these above concerned through improving the quality, safety certification system, product standard development and production technology development, GMP and GHP code of conduct and other procedure and guideline needed, especially for the fisheries products which we prioritize based on a very needed and required much by our people and the market such as the Prahoc, Trey Ngiet, and Frozen shrimp start to develop for the National Product Standard to support the sustainable of our fisheries management and food security and nutrition for contributing to poverty alleviation.

These 3 national product standard, was supported by the FAO-TCP, EU to develop through many process of consultation meeting from the processor level to national to regional expert and lastly by the national technical and national board committee to approved and many times and sample of laboratory testing to prove the evident before the approval as the national standard almost for 5 years and then request for processors and stakeholder to us as the voluntary standard first before apply to the mandatory standard. But in order to make sure our only our national standard is effective we need to conduct experiment throughout the demonstration site of their effectiveness. So the main objective of this promoting the national fisheries product standard to contribute in to the blue growth development throughout the implication of the application of the Prahoc and Trey Ngiet which are very uniqueness product and also this product standard is not available at any other country, regional or international standard yet and it main aim to improve our Prahoc and Trey Ngiet Product quality, safety, with proper labeling and certify that can access to the market for better livelihood and cut down of the economic loss and value loss of the product and also to bring back of our uniqueness product brand name " Prahoc Siem Reap made in Cambodia" and also would like to extend of this standard to the regional and international standard too.

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

INFOFISH an Intergovernmental Organization For Marketing Information and Technical Advisory Services in the Asia Pacific Region which is based in Malaysia has thirteen member countries and is the Asia Pacific component of the Fish Info Network (FIN) of the Food and Agriculture Organization.

Marketing Information and Technical Advisory services are the core activities of the INFOFISH, catering the information needs of the fishery stake holders in the Asia Pacific Region by collecting, analyzing, compiling, and dissemination of data through publications produce by INFOFISH.

Training workshops, Technical and Trade Conferences organized for commodities which have major contribution to the blue growth of the region, always address the latest issues developments, requirements and make recommendation for the way forward to the sustainable development.

Training awareness and knowledge is crucial in achieving the blue growth in productive and sustainable manner in order to ensure responsible deal with the environment and the resources.

Executing projects, provide consultancies, producing technical manuals for the fishery industry are the other activities carried out by INFOFISH which have significant impacts towards the quality improvement of fisheries products exported and also complying with the market access requirements.

The ongoing CFC/FAO/INFOFISH project on promotion of processing and marketing of freshwater fish products from selected five countries is to encourage the sustainable utilization of freshwater fish resources of the selected countries with an objective of processing, value addition and marketing.

INFOFISH TUNA the World Tuna Conference dedicated fully for the Tuna industry which is happening once in two years, is the world's largest tuna gathering to discuss issues challenges, innovations, farming experiences and the way forward towards the sustainable growth of tuna industry. Tuna is one of the major contributing species to the blue growth in the Asia Pacific and the world. Tilapia and Ornamental Fish conferences are the similar kind of product specific conferences organize by the INFOFISH, which are well known to the particular industry stakeholders of the Asia Pacific region.

CAN MANGROVES AND AQUACULTURE CO-EXIST? CASE STUDIES FROM MFF COUNTRIES

Mr Raquibul Amin, Senior Operations Manager, Mangrove for the Future

In most of the MFF[2] countries South and Southeast Asian countries, mangrove conservation and aquaculture development, especially the shrimp are national priorities. It is a precarious situation

[2] 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.

for the growth of the shrimp had a tremendous impact on the mangroves. For example, in Indonesia, the value of mangroves- based fisheries, especially farmed shrimp, is worth around US$ 1.8 billion each year, the highest value amongst Indonesia's fishery products (Ministry of Marine Affairs and Fisheries, 2013). On the other hand, 750,000, ha of mangroves had been lost due to their conversion to 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 the provincial governments to consider mangrove-polyculture as an integrated part of the coastal protection strategy. In another successful pilot in Ca Mao province, IUCN, and SNV, the Netherlands Development Organization are supporting shrimp farmers to become certified using an organic label for using an integrated mangrove-shrimp model in which each household is allocated 3-5 hectares, of which 60% should be mangrove-covered according to a national regulation. Wetland International Indonesia, the MFF partner in Indonesia, has demonstrated the use of mangrove-based aquaculture in rehabilitating the abandoned shrimp farms.

These successful examples from these 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. Three country cases though differ in their context, show evidence that mangrove-based aquaculture can be an option for rehabilitating mangroves areas degraded due to shrimp farming.

CONCLUSIONS AND RECOMMENDATIONS OF THE SIXTH RCFM FOR REPORTING TO THE THIRTY-FOURTH SESSION OF APFIC

The participants at the APFIC 6th 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 (8th to 14th 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 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, IPOA's (IUU), PSM, VGSSF, and SDG's regional frameworks. Other non-fishery related frameworks may be linked such as: CDB, UNFCC, Regional Seas, ILO and IMO.

OPPORTUNITIES FOR BLUE GROWTH IN MARINE FISHERIES

Blue growth through application of ecosystem approach to fisheries has been achieved in some small-scale fisheries by reduction of bycatch, improved value chain, use of selective gears, better prices for catch, and use of IT (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 involve reduction of overall effort and improvement of overall catch value through use of large mesh sizes. More effective zoning of trawling to avoid impacts of sensitive habitats in nearshore 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 through reduction of wastage and improved value of catches and reduction of loss from IUU fishing;
- Blue growth in a fishery cannot be achieved where there are 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 reduction in effort and 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 fisheries can still be achieved 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 current state;
- Blue growth through stock recovery, improving efficiency in marine fisheries may involve reduction in effort and the number of fishers with appropriate compensation or mitigation; and
- Need to have mechanisms to address loss of fishing opportunity through introduction of seasonal bans or other management.

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 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 towards more holistic blue growth planning, in particular the linkages between land and water;
- Rehabilitation of degraded habitats, protection or LMMA 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.

Recommendation: 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 of species.

Recommendation: Promote monitoring and knowledge for management

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

Recommendation: Support and empower inland fishers

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

OPPORTUNITIES FOR BLUE GROWTH IN AQUACULTURE

The RCFM agreed that Blue Growth in aquaculture can contribute significantly to meeting the increasing demand for fish in the Asian 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.

Recommendation: 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 legal framework to ensure blue growth principles that are backed up by laws/regulations;
- Identification of sites for expansion of mari-culture/aquaculture;
- Zoning and carrying capacity plans be developed;
- Seabed and open water (e.g. reservoirs/lakes) allocation be undertaken ensuring that marginalization or displacement of fishers are avoided;
- Biosecurity be strengthened to limit the transmission of disease(s); and
- Apply precautionary approaches related to movements and introductions.

Recommendation: 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);

- Reduction of feed use and dependence on fish meal and more efficient feed use; Production of fish meal alternatives;
- Reduction of chemical use in culture operations, assisted by GAP;
- Exploration of species which have tolerance to potential climate change effects (salinity, temperature etc.);
- Reduced carbon footprint of aquaculture operations;
- Explore the scope for increased participation of women in aquaculture;
- Development of private aquaculture insurance programmes;
- Mariculture development as a means to offset declining fishery revenues and livelihoods; and
- Maximising the potential of IT for aquaculture management e.g. increasing availability of IT applications (e.g. smart phone applications) that can be used by small –scale farmers for improving feeding efficiency, aeration efficiency and energy saving.

Recommendation: Promote integrated culture systems as a means to reduce environmental footprint and improve the efficiency of nutrients 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 risks 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 initiative including application of EAFM will help producing countries to be better prepared and even avoid potential non -tariff and market measures imposed by importing countries.

Recommendation: 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 premium for organic or mangrove-friendly certification. These systems can be a driver for rehabilitation of degraded coastal environments. The ratio of farm/pond to mangrove habitat is variable but more economic data on the profitability of different systems is needed.

Recommendation: 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 into 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 are a range of ways to capture opportunities in existing or innovative production systems in both capture fisheries and aquaculture.

Recommendation: Seek ways to adjust or improve system to reduce their carbon footprint, adapt to changing climate and increase their 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 as carbon sequestration as well and improved ecosystem services(including erosion control, water retention, flood mitigation, sediment trapping etc.) in both marine an 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 initiative may not meet the 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 area 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.

Recommendation - Clarify the linkages between the VGSSF and blue growth and build into safeguards.

- The recently agreed VGSSF support the visibility recognition and rights of small-sale fisheries;
- As a complement to the CCRF they also underpin "blue growth". In this regard the VGSSF give context and guidance on how to ensure that blue growth initiatives can contribute positively to small-scale fisheries;
- This can be directly in application of blue growth to small-scale fisheries and also where blue growth initiatives are initiated in larger-scale fisheries and aquaculture, 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.

Recommendation – 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.

Recommendation - Blue growth should not push inappropriate technology or drive producers in to 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 assessments. 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 showing some declining trends in catches for large and medium sized species. CPUE is also declining in those fisheries 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 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 precautionary approach to ensure it is a blue growth type activity.

Recommendation: Strengthen the assessment and monitoring of fisheries.

Recommendation: 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 Ecosystem Approach to fisheries.

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

- Monitor the impacts (environmental, social, economic) of aquaculture and mariculture development need to be monitored 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 the business and private sectors and the consumers as major drivers of the 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 for promoting 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 EEAFM training course;
- Regional cooperation on PSM; and
- Training in vessel inspection, VMS and MCS.

Inland fisheries

- Cooperation in 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, fisherman 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 of and communication of best practices;
- Development and piloting a regional program for promoting each Blue Growth approaches;
- Exchange of knowledge and training on lessons learnt, innovative systems and approaches;
- Science policy platform - that would also facilitate the translocation of science advice and policy to producers (e.g. Coral triangle fisherman forum and Coral Triangle business forum); and
- Promotion of greater research cooperation related to Blue Growth both regional and international.

CLOSING OF THE RCFM

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

APPENDIX A - LIST OF PARTICIPANTS

Bangladesh	
Nasiruddin Md Humayun Director (Marine) Marine Fisheries Office, Department of Fisheries Chittagong Bangladesh	Tel: +880 173 157 4792 Email: nasir_dof@yahoo.com
Bhutan	
Pratiman Rai Livestock Production Supervisor National Centre for Aquaculture Gelephu Bhutan	Tel: +975 6-251200 Mobile: +975 17714265 Email: pratimanrai2011@yahoo.com
Cambodia	
Kao Sochivi (Ms) Deputy Director General of Fisheries Administration Fisheries Administration Ministry of Agriculture, Forestry and Fisheries #55, ST 08, Sangkat Niroth, Khan Chba Ampove Phnom Penh, Cambodia	Tel: +855 12 202 805 Email: kaosochivi@yahoo.com
Somony Thay Director of Department of Aquaculture Development, Fisheries Administration Ministry of Agriculture, Forestry and Fisheries #186 Preah Norodom Blvd. Phnom Penh, Cambodia	Mobile: +855 12 829 971 Email: monyangkor@gmail.com
Indonesia	
Maskur Aquaculture Senior Officer Directorate General of Aquaculture, Ministry of Marine Affairs and Fisheries Mina Bahari 4 building, floor 8, Medan Merdeka Street Jakarta, Indonesia	Tel: +62 81 299 73474 Email: maskurfish@gmail.com
Japan	
Masahito Hirota Chief Scientist of Fisheries Management	Tel: +81-45-788-7674 Fax: +81-45-788-7674

Fisheries Research Agency of Japan National Research Institute of Fisheries Science 2-12-4, Fikuura, Kanazawa, Yokohama, 236-8684 Japan	Email: mmhirota@affrc.go.jp
Lao PDR	
Bounthanom Chamsing Deputy Chief of Fisheries Management Section Department of Livestock and Fisheries Vientiane, Lao PDR	Email: chamsinhbounthanom@gmail.com
Malaysia	
Abu Talib Bin Ahmad Senior Director of Research Department of Fisheries Malaysia Fisheries Research Institute 11960 Batu Maung, Penang, Malaysia	Tel: +604 626 3925 Fax: + 604 626 2210 Email: abutalib01@dof.gov.my abutalib01@yahoo.com
Hemalatha Raja Sekaran (Ms) Fisheries Officer Planning and Development Division Department of Fisheries Malaysia Level 2, Tower Block 4G2, Precint 4 Wisma Tani 62628, Putra Jaya Malaysia	Tel: +601 660 32768 Fax: +603 888 91195 Email: hemalatha@dof.gov.my
Maldives	
Hassan Shakeel Senior Biologist Marine Research Center, H. White Waves Moonlight Hingun, Male' 2002 Republic of Maldives	Tel: +960 332 2242 Fax: +960 332 2509 Email: hshakeel@mrc.gov.mv
Myanmar	
Aung Naing Oo Deputy Director Department of Fisheries Ministry of Livestock, Fisheries and Rural Development Office No (36), Pannita Street, Ottara Thiri Township,Nay Pyi Taw Myanmar	Tel: +95 925 016 697, +95 67 408 476 Fax: +95 67 418538 Email: ano93dofmm@gmail.com
Nepal	

Rama Nanda Mishra Program Director Directorate of Fisheries Development Central Fisheries Building, Machha Pokhari Balaju, Kathmandu, Nepal	Tel: +977 16 200 733 Fax: +977 14 350 833 Email: aryanmishra017@gmail.com
Pakistan	
Maratab Ali Assistant Fisheries Development Commissioner – II Ministry of Ports & Shipping, Room No. 439, 4th Floor Block "D" Pak, Secretariat, Islamabad Pakistan	Tel: +92 519213557; +92512245174 Fax: +92 519204067 Email: maratabaliawan@gmail.co
Sri Lanka	
M C L Fernando Director General Department of Fisheries and Aquatic Resources Ministry of Fisheries and Aquatic Resources Development New Secretariat, Maligawatta, Colombo 10 Sri Lanka	Tel: +94 (0) 11 247 2167 Fax: +94 (0) 11 244 9170 Email: mclfenando@gmail.com
Monty Ranatunga Director General (Technical) Ministry of Fisheries and Aquatic Resources Development New Secretariat, Maligawatta, Colombo 10 Sri Lanka	Tel: +94 (0) 11 232 9666 Fax: +94 (0) 11 239 3096 Email: montyslps94@gmail.com
P Nimal Chandraratne Director General National Aquaculture Development Authority of Sri Lanka (NAQDA) 41/1, New Parliament Road Pelawatta, Battaramulla Sri Lanka	Tel: +94 (0) 11 2786497, +94 71 446 8208 Fax: +94 (0) 11 278 6497 Email: nimalchandraratne@yahoo.com dg.naqda@gmail.com
Buddhika Iddamalgoda Director General National Aquatic Resources Research and Development Agency, Sri Lanka	Tel: +94 (0) 11 252 1932 Mobile: +94 77 305 3593 Fax: +94 (0) 11 252 1932 Email: dg@nara.ac.lk

H M Palitha Kithsiri Deputy Director General Research and Development National Project Coordinator (FAO/TCP/SRL/3502) National Aquatic Resources Research and Development Agency (NARA) Crow Island, Colombo15 Sri Lanka	Tel: +94 (0) 11 252 0638 Mobile: +94 718 442 728 Fax: +94 (0) 11 252 0638 Email: palihikkaduwa@gmail.com palikithsiri@nara.ac.lk
Rekha Maldeniya Principal Scientist Head Marine Biological Resources Division National Aquatic Resources Research and Development Agency (NARA), Sri Lanka	Tel: +94 (0) 11 252 1006 Mobile: +94 71 820 7071 Fax: +94 (0) 11 252 1934 Email: rekhamaldeniya@gmail.com
H P K Hewapathirana (Ms) Deputy Director (Biologist) Department of Fisheries and Aquatic Resources Colombo, Sri Lanka	Tel: +94 (0) 11 247 0439 Fax: +94 (0) 11 247 0439 Email: hewakal2012@gmail.com
Percy A Samarasinghe Deputy General Manager (Operations) Ceylon Fishery Harbours Corporation Sri Lanka	Tel: +94 (0) 71 492 7805 Mobile: +94 71 492 7805 Fax: +94 (0) 11 293 6788 Email: percy.lk@gmail.com
K B C Pushpalatha Director (Extension) National Aquaculture Development Authority of Sri Lanka 41/1, New Parliament Road Pelawatta, Battaramulla Sri Lanka	Tel: +94 71 866 1416 Fax: +94 11 278 6579 Email: pushpakbc@yahoo.com directorext@naqda.gov.lk
Upali S Amarasinghe Senior Professor in Zoology Department of Zoology & Environmental Management University of Kelaniya, Kelaniya GQ 11600, Sri Lanka	Tel: +94 (0)11 290 3397 Fax: +94 (0)11 291 4479, +94 (0)11 290 3203 E-mail: zoousa@kln.ac.lk

S H N P Gunawickrama Senior Lecturer General Sir John Kotelawala Defence University Sri Lanka	Tel: +94 (0) 71 820 9986 Email: nandana.gunawickrama@gmail.com
J M P K Jayasinghe Senior Professor Department of Aquaculture and Fisheries Wayamba University of Sri Lanka Sri Lanka	Tel: +94 (0) 77 747 7426 Fax: +94 (0) 31 229 9870 E-mail: jmpkjaya@gmail.com
C Y L Jayasinghe Head, Department of Food Science & Technology Wayamba University of Sri Lanka Sri Lanka	Tel: +94 (0) 31 229 9871 Fax: +94 (0) 31 229 9871 Email: cvljayasinghe@gmail.com
Sepalika Jayamanne Dean, Faculty of Animal Science and Export Agriculture Uva – Wellassa University of Sri Lanka Sri Lanka	Tel: +94 (0) 55 355 9114 Fax: +94 (0) 55 222 6470 E-mail: sepalika@uwu.ac.lk; sepalikauwu@yahoo.com
J A Athula Senior Lecturer, Department of Animal Science Uva – Wellassa University of Sri Lanka Sri Lanka	Tel: +94 (0) 71 448 1555 Email: athulajasin@gmail.com
Nemindra Menamperi Assistant Director Export Development Board Sri Lanka Sri Lanka	Tel: +94 (0) 11 2300 0732 Mobile: +94 71 841 2835 Fax: +94 (0) 11 230 4879 Email: nemindra@edb.gov.lk
Cyril Wickramasinghe Development Officer Export Development Board Sri Lanka Sri Lanka	Tel: +94 (0) 11 2300 0732 Mobile: +94 71 642 7744 Fax: +94 (0) 11 230 4879 Email: cyril@edb.gov.lk
Thailand	

Jutarat Kittiwanich (Ms) Fishery Biologist, Senior Professional Level Marine Shrimp Culture Research and Development Institute, Coastal Fisheries Research and Development Division, Department of Fisheries Paholyothin Road, Kasetsart University Campus Chatuchak, Bangkok 10900 Thailand	Tel: +66 858850311 Fax: +662 561 0786 Email: jutark@yahoo.com
United States of America	
Michael E Abbey NOAA Fisheries (NMFS), Office of International Activities and Seafood Inspection Lead for Asia-Pacific Capacity Building 1315 East West Highway Cubicle 10644 Silver Spring, Maryland, 20910	Tel: +301 427 8355 (direct) +301 938 9544 (Govt cell phone, international access) Email: Michael.Abbey@noaa.gov
Viet Nam	
Nguyen Thi Hong Nhung (Ms) Fisheries Administration Vietnam Ministry of Agriculture and Rural Development 10 Nguyen Cong Hoan, Hanoi, Vietnam	Tel: 0915 977 227 Email: nhung.doa@gmail.com

INTER-GOVERNMENTAL ORGANIZATIONS AND REGIONAL ORGANIZATIONS	
Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO)	
Rajdeep Mukherjee Project Coordinator (OPP Project) Bay of Bengal Programme Inter-Governmental Organisation 91, St. Mary's Road, Abhirampuram Chennai - 600 018, Tamil Nadu, India	Tel: (0091) 44 2493 6188 Fax: 44 2493 6102 Email: rmukherjee@bobpigo.org; pc@bobpabnj.org
International Collective in Support of Fishworkers (ICSF)	
Vivekanandan Vriddagiri 43 Asan Nagar Vallakadavu Post Trivandrum 695008 India	Mobile : 91 96 7703 4670 Email: vivek.siffs@gmail.com vivek@siffs.org

INFOFISH	
O M C Kumudine (Mrs) Senior Trade Promotion Officer INFOFISH 1st Floor, Wisma LKIM Jalan Desaria, Pulau Meranthi 47120, Puchong, Selangor DE Malaysia	Tel : +60 3 8064 9298 Mobile : + 60 3 1623 95502 Email : kumudinie@infofish.org
Mohd Hazmadi Bin Zakaria Technical Advisory Officer Technical Advisory Service Division INFOFISH 1st Floor, Wisma LKIM Jalan Desaria, Pulau Meranthi 47120, Puchong, Selangor DE Malaysia	Tel: +603-8064 9292 / 9291 Fax: +603-8060 3697 Email: hazmadi@infofish.org
International Union for Conservation of Nature (IUCN)	
Raquibul Amin Senior Operations Manager International Union for Conservation of Nature/ Mangroves for the Future (IUCN/MFF) 63 Sukhumvit 39, Wattana Bangkok 10110 Thailand	Tel: +66 2 662 4029 Fax: +66 2 662 4387 Email : raquibul.amin@iucn.org
Damith Chandrasekara National Coordinator – MFF Programme IUCN (International Union for Conservation of Nature), Sri Lanka Country Office 53, Horton Place, Colombo 07 Sri Lanka	Tel: +94 773 521 421 Fax : +94 11 268 2470 Email : damith.chandrasekara@iucn.org
Mekong River Commission (MRC)	
Ngor Peng Bun Capture Fisheries Specialist Mekong River Commission Secretariat 576 National Road, #2, Chak Angre Krom Phnom Penh, Cambodia	Tel : +855 77 366 689 Fax : +855 23 425 363 Email : pengbun@mrcmekong.org; Pengbun.ngor@gmail.com
Network of Aquaculture Centres in Asia-Pacific (NACA)	

Yuan Derun Programme Manager Network of Aquaculture Centres in Asia-Pacific (NACA), Suraswadi Building, Department of Fisheries, Kasetsart University Campus Ladyao, Jatujak, Bangkok 10900 Thailand	Tel : +662 561 1728 Fax : +662 561 1727 Email : yuan@enaca.org
South Asia Co-operative Environment Programme (SACEP)	
Muhammad Khurshid Director General South Asia Co-operative Environment Programme (SACEP), # 69/4, Maya Avenue, Colombo 06 Sri Lanka	Tel: +94 11 258 9376, 250 4708, 259 6442 Fax: +94 11 258 9369 Email: secretary@sacep.org khurshid@sacep.org
Pulakesh Mondal Senior Programme Officer (Regional) South Asia Co-operative Environment Programme (SACEP), # 69/4, Maya Avenue, Colombo 06 Sri Lanka	Tel: +94 11 5621320, 250 4708, 259 6442 Fax: +94 11 258 9369 Email: secretary@sacep.org pulakesh.mondal@sacep.org
SEAFDEC REBYC II	
Bundit Chokesanguan Southeast Asia Fisheries Development Center P.O.Box 97, Phrasamutchedi Samut Prakarn 10290 Thailand	Tel: +662 425 6120 Fax: +66 (0) 2 425 6110 Email: bundit@seafdec.org
Sayan Promjinda Southeast Asia Fisheries Development Center P.O.Box 97, Phrasamutchedi Samut Prakarn 10290 Thailand	Tel: +66 (0) 2 425 6146 Fax: +66 (0) 2 425 6110 Email: sayan@seafdec.org
WWF Coral Triangle Program	
Jose Ingles Program Coordinator Fisheries Improvement Projects and Policy WWF Coral Triangle Program c/o WWF Philippines JBD Plaza, 4th Floor 65 Mindanao Ave., Pagasa, Quezon City Philippines	Tel: +632 9251 891 Email: ingles.jose@gmail.com
FAO	

Simon Funge-Smith Senior Fishery Officer (FIAF) Room F603 FAO Rome Viale delle Terme di Caracalla, 00153 Rome Italy	Tel: + 39 06 5905 52046 Email: simon.fungesmith@fao.org
FAO Consultant	
David Brown Regional Fisheries Programme Consultant FAO Regional Office for Asia and the Pacific 39 Phra Athit Road Bangkok Thailand	Tel: +66 2 697 4173 Fax: + 66 2 697 4445 Email: david.brown@fao.org

APPENDIX B - 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?"** *Representative of the FAO Fisheries and Aquaculture Department*
10.45–11.15	**Coffee break**
11.15–11.45	**"The need and opportunities for Blue growth in Aquaculture in the Asia-Pacific"** *APFIC Secretariat , FAO Regional Office for Asia and the Pacific*
11.45–12.00	**Forum arrangements** *Presentation by the APFIC Secretary* *Group photo*
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)** *APFIC Secretariat, FAO Regional Office for Asia and the Pacific*
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) Examples of blue growth approaches in culture based fisheries and aquaculture (Mr Nimal Chandraratne, Sri Lanka) Precautionary approach to sustainable growth of marine fisheries resources in the Bay of Bangle: Bangladesh Perspective (Mr Nasiruddin Md Humayun, Bangladesh)
15.30–16.00	**Coffee break**
16.00-17.30	4 Country presentations on examples of blue growth approaches in inland & marine fisheries Developing an Implementation Strategy for Fisheries and Aquaculture management and development in Lao PDR (Bounthanom Chamsinh, Lao PDR) Strategies to attract private sector investment in aquaculture for self-sufficiency in Nepal (Mr Rama Nanda Mishra, Nepal) 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) General discussion
DAY 2	
09.00–10.30	**SESSION 3: Regional examples of blue growth approaches in inland & marine fisheries** Regional examples of Blue Growth initiatives Scope and practice of fisheries Co-Management approaches in SACEP Region (Mr Pulakesh Mondal, SACEP) Knowledge Management for Responsible Fisheries Development – Initiatives in Bay of Bengal Region (Mr Rajdeep Mukherjee, BOBP-IGO) Fisheries in the Lower Mekong Basin: an update (Mr Ngor Peng Bun, MRC) Blue economy initiatives in Fisheries in the Coral Triangle (Dr Jose Ingles, WWF) REBYC-II CTI: The Way Forward for Trawl Fisheries Management in Southeast Asia and Coral Triangle Region **(Mr. Sayan,** SEAFDEC REBYC II Project) Enhancing Capacities of fishing communities through implementation of FAO-VGSSF (Mr Vivekanandan Vriddagiri, ICSF) 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)

10.30–11.00	**Coffee break**
11.00-12.30	**SESSION 4: Working group session** 3 working groups working on three Opportunities for blue growth in inland fisheries the APFIC region Precautions to ensure this growth is "blue" Blue growth indicators Regional opportunities and needs for capacity building
12.30–14.00	**Lunch**
14.00-15.30	**SESSION 5: Blue growth in Asian aquaculture** 6 Country examples of blue growth aquaculture systems Aquaculture of Pangasius in Vietnam 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 Kittiwanich, 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	5 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 prodct 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** 3 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 & 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 6th RCFM**

APPENDIX C – 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 SouthAsia 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 6th 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 6th RCFM is attended by more than 50 participants. These are representatives from 15 FAO Member countries in South and SouthEast Asia and representatives of 9 regional organizations, relevant to fisheries and aquaculture and the aquatic/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 34th 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 34th Session which 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.

Thankyou all

OPENING REMARKS 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

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 the 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 6th 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 34th 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 organization and convening of this Regional Consultative Forum Meeting.

Finally, I thank you, the participants for your participation and look forward to your contribution over the next three days to help Asia-Pacific Fishery Commission continue to perform its function 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.

OPENING SPEECH 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

Ms. W.M.M.R. Adikari

Secretary, Ministry of Fisheries and Aquatic Resources Development, Sri Lanka