

**Report of the First Meeting of the Andaman Sea sub-region
Phuket province, Thailand**

20-22 October 2009



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4. Specifically, the Meeting aimed to provide a venue to explore options to lay the foundation for the introduction of larger fisheries resources conservation areas (*refugias*) by initiating a dialogue with the countries around the Andaman Sea as well as promoting collaboration among agencies and organizations working on fisheries, environment and marine and coastal resources management in the Andaman Sea, and review and provide action-oriented recommendations in the Andaman Sea context on key issues of regional concern such as habitat management, fishing capacity, IUU fisheries, vessel registration, among others. Main parts of the discussions during the meeting will be reflected in sections on recommendations after each thematic issue. The Prospectus of the Meeting is shown as **Annex 3**.

5. The Meeting adopted the Agenda, which appears as **Annex 4**.

III. DISCUSSIONS ON THEMATIC ISSUES

3.1 *Integration of fisheries and habitat management, fisheries resources conservation areas (refugia) – ecosystems approach*

6. The Meeting noted the increased attention being given to the need to apply ecosystems based approaches to management and that various consultations have been conducted in the ASEAN region on the perspective of fisheries resources conservation and management. Through SEAFDEC consultations have more specifically been focused on the integration of fisheries management and habitat management. Presently, there are in the region a whole range of management schemes, such as MPAs, Ramsar sites, heritage sites, etc. The Meeting was informed that in an effort to review such management schemes, an inventory of the existing management schemes has been initiated for the ASEAN-Andaman Sea countries. In addition, the Meeting was also informed on the possibility of establishing a larger management areas (*refugia*) in the Andaman Sea based on the existing smaller management schemes.

7. The Meeting took note of the presentation made by RFPN Member for Myanmar, Mr. Nyunt Win on the integration of fisheries and habitat management and fishery resources conservation areas. He also introduced the initial inventory of different types of areas established for various environmental, fisheries, shipping or other management purposes by the ASEAN countries Indonesia, Malaysia, Myanmar, and Thailand in the Andaman Sea area. In the presentation, Mr. Win outlined the building up of fisheries resources conservation areas (*refugias*) in the context of ecosystems management and proposed some criteria for fisheries resources conservation as well as the elements of a larger ecosystem management area. The discussion indicated strong support to these larger areas including trans-boundary arrangements as needed. During the discussion, the Meeting provided some further inputs to the initial inventory which is to be followed up by SEAFDEC and participating countries. The initial inventory and the presentation by Mr. Win appear as **Annex 5**.

8. Moreover, the representative from India, Dr. Venkataramiah Krishnamurthy introduced the management and conservation schemes adopted in the Andaman-Nicobar Islands (**Annex 6**). Specifically, the Meeting was informed that the fishery resources of the Andaman-Nicobar Islands are not yet over-exploited. However, adoption of management approaches is considered relevant for the conservation of the fishery

resources and important habitats. The presentation nicely complemented information provided on the other countries.

9. In an area like the Andaman Sea, there is a need to explore ways to manage the resources of trans-boundary and (highly) migratory species. To provide a background the representative from Thailand, Ms. Praulai Nootmorn reported on the results of studies on *Rastrelliger* spp. and related species. The report appears as **Annex 7**. The report included information on Thailand's production of *Rastrelliger* spp. (i.e., *R. brachysoma* and *R. kanagurta*) in 2007 of about 70,800 mt or about 8% of the country's total production from marine capture fisheries in the Andaman Sea, together with information on its life cycle, maturation stages and distribution in the Andaman Sea. The information gathered on the status of the fisheries led to the extension of the country's regulation on closed season for *Rastrelliger* spp. fishing in the Andaman Sea. The closed season lasts from 1st April to 30th June of each year. Furthermore, the conservation area was expanded from 2,000 km² to 4,000 km² in the Andaman Sea area of Thailand. Ms. Praulai added that such regulation also covers other species such as cuttlefish, anchovy and *Nemipterus* spp. as these economically important species also spawn in the same areas as the *Rastrelliger* spp.

10. The information provided on the migration of *Rastrelliger* spp. clearly indicated loops of migration across boundaries of Myanmar and Thailand, and Thailand, Malaysia and Indonesia, respectively. In the discussion, it was stated that this was a good example on trans-boundary movements of fish. While at the same time it is important to highlight the multi-species nature of the fisheries, as indicated by the Thai regulations also covering cuttlefish, anchovy and *Nemipterus* spp. (*Rastrelliger* spp. and "related" species).

11. The representative from Myanmar, Mr. Aung Htay Oo informed the Meeting on the Status of Hilsa (*Tenualosa ilisha*) Fisheries in Myanmar (**Annex 8**). Hilsa is also an important shared fisheries resource in the Andaman Sea area. For Myanmar, the Hilsa is of high economic importance providing large export earnings. Information provided by the presentation and confirmed during the discussion is that migration of Hilsa covers areas of Myanmar, Bangladesh and India. Furthermore, a specific feature of Hilsa type species is that it also migrates up into river systems (anadromous). During the discussion, it was made known that Hilsa species also are common in Malaysia and Indonesia although in Thailand, *Hilsa toli* has been observed to be locally extinct. Furthermore, there was some input on the Hilsa research (ACIAR) in Bangladesh which has led to some promising, effective management measures to be studied and promoted.

Recommendations:

- (1) To further develop and complete an inventory of existing management areas and zones established for purposes ranging from environmental protection, fisheries resources conservation, heritage to traffic separation schemes for shipping and safety zones around off-shore installations (oil rigs, etc).
- (2) To establish focal points among participating countries to provide information and feedback to the SEAFDEC-Sida Project on the inventory of "management areas" or "conservation zones" set up for different purposes, including accurate maps of the management areas indicating the coordinates, for easy reference. There should be a focus on the Andaman Sea region in developing the inventory.

- (3) Define suitable larger fisheries resources conservation areas (*refugia*) an aggregation or network of already established small management areas. The area should be large enough to manage and to protect trans-boundary habitats and (highly) migratory species “embracing” a number of existing defined management areas. The more specifically defined size of the area should gradually be developed through consultative processes involving coastal villagers, the traditional users of the resources, researchers, local and central authorities and other stakeholders, taking into consideration the following factors:

- a) *To build upon an aggregation of smaller management areas (established for local fisheries, fisheries resources protection, habitat management and/or other purposes);*
- b) *To recognise the existing zoning schemes (like trawling free zones);*
- c) *To take note of the seasonality in fishing, fish migration/spawning, etc.*

Focus could, tentatively, be on four, very broad areas: 1) From Phuket down to the One Fathoms Bank (Selangor and North Sumatra); 2) From Phuket up along the coastline of eastern Myanmar and the Myeik/Mergui Archipelago; 3) The Western part of Myanmar, Bangladesh and India (including northern Andaman and Nicobar Islands); 4) India (Southern Andaman and Nicobar Islands) and Indonesia (Banda Aceh).

- (4) The number and locations of sea mounts was considered not to be well documented in the Andaman Sea and it was recommended that review(s) should be made to survey the existence of sea mounts in the Andaman Sea as these could be potential biodiversity hotspots.
- (5) Information should be gathered on sources of information on important habitats throughout the Andaman Sea region by dialogue with the countries around the Andaman Sea and through contacts with organizations such as IUCN, WWF, Wetlands International, etc.
- (6) Initiate development of management measures for *Rastrelliger* spp. and related species highlighting the need for and design of regulatory measures, considering that these fishery resources are shared by Thailand, Indonesia and Malaysia (on the southeast Andaman/Malacca Strait) and Myanmar and Thailand (in the Northeast Andaman).
- (7) Due consideration should be given to the importance of estuaries, deltas and river systems to the productivity of the Andaman Sea as well as of its importance as a main source of aquatic production. Special attention to anadromous species like *Hilsa* spp.
- (8) Facilitate the sharing of biological, social, economical and other (scientific) data on economically important species as well as on endangered species and important habitats. Furthermore, emphasise the importance of oceanographic data (e.g., seasonal changes in water currents) in focal areas and the Andaman Sea as a whole. Consider, also, undertaking DNA studies on the Indo-Pacific mackerel juveniles.
- (9) Pay more attention on the conservation of *Hilsa* resources by controlling the catch of its juveniles through mesh size regulation, creating stakeholders’ awareness on *Hilsa* fisheries management. Involve relevant stakeholders (e.g.,

institutions such as irrigation and national pollution agencies for inland fisheries management, also oceanographers (for marine management areas) in the management of Hilsa fisheries considering that Hilsa is anadromous and found in rivers as well as marine areas.

- (10) Examine factors such as climate change that lead to distribution shift and production fluctuations of important fishery resources, or where primary productivity is decreasing but production is increasing (paradox of the time).
- (11) Consider fisheries *refugia* as a tool for the management of the whole life cycle of important fishery resources instead of just Marine Protected Area (MPA) which gives more focus on habitat conservation (*e.g.*, coral reefs, sea-grass beds, mangroves, etc.). In the process incorporate and build upon MPAs and other management schemes in developing the *refugia* zoning and management.
- (12) Efforts should be done to harmonize and/or (initially) assess areas of compatibility of national regulations as a tool for cooperation and specifically point at the need for flexibility to allow for the integration of fisheries management with habitat management.
- (13) A basic recommendation to improve management was to promote and generate compliance to reduce the need for strict enforcement.
- (14) Develop a glossary of the terms used by Andaman countries with reference to the national definitions as stated in laws and regulations (if available) to see if this could be synthesised into a common set of definitions or at least come up with common reference points that could be used in the process of the establishment of fisheries resources conservation areas. In the process also take into consideration definitions provided by IUCN and other international organisations.

3.2 MCS Network, Vessel Record and Inventory

12. The Meeting was informed on the process, initiated by the Gulf of Thailand Sub-region members, to establish a MCS network. This network would initially have its focus on information sharing, such as on the number and types of boats, people involved in fishing, landings among others. The Meeting was also informed on the process to develop a fishing vessel record and inventory in Southeast Asia as well as in the Gulf of Thailand Sub-region.

13. The Meeting took note of the presentation made by the RFPN Member for Thailand, Ms. Piyawan Hussadee on the MCS Network, Vessel Record and Inventory, focusing on the management measures and tools that could be used (**Annex 9**), such as those discussed during the Sub-regional Meeting on the Gulf of Thailand (*i.e.* Monitoring, Control and Surveillance (MCS), MCS Network, vessel record and inventory, port monitoring).

14. The representative from Thailand expressed the view that effective implementation of MCS would depend on the fisheries management policy of each country. Although an extensive MCS system is very costly to manage alternative systems could be tested. As tried by the CHARM project elements can be operated at the local or fishing community

level. This can be effective through capacity building of fishermen enabling them to understand the context and to collect data in support of the “Monitoring” aspect as well as to establish local structures for purposes of creating reference points as a basis for “Control”.

15. The Meeting was also informed on the negotiations on the draft legally-binding Port State Measures, which has been finished but need the endorsement of FAO later during 2009 before it can be adopted by the FAO Committee on Fisheries (COFI) in early 2010. Reference was made to the definition of IUU indicated in the legally-binding Port State Measures. In the perspective of a definition of IUU fishing applicable to the Andaman Sea, the Meeting reviewed the definition agreed by the Gulf of Thailand countries in February 2009. The Andaman Sea countries shared the opinion and it was agreed that the definition of IUU fishing applicable to the Andaman Sea should be:

- Conducted by national or foreign vessels in waters under the jurisdiction of a state, without the permission of that state, or in contravention of its laws and regulations
- In violation of national laws or relevant international obligations
- Which have not been reported, or have been misreported, to the relevant national authority, in contravention of national laws or regulations
- In areas or for fish stocks in relation to which there are no applicable conservation or management measures and where such fishing activities are conducted in manner inconsistent with State responsibilities for the conservation of living marine resources under international law

16. The meeting reviewed and discussed the institutional matrix on Monitoring, Control and Surveillance and its relevance to support the building up of and MCS network for the Andaman Sea Sub-region. The relevance was confirmed and it was suggested that a number of central activities should be indicated under each category and at this stage it was no need for a “complete” list activities. Having done that, the information on “responsible institutions”, “supporting legislation” and relevant “convention/international agreement” should be added to the matrix. Furthermore, the Meeting suggested that the matrix should be left as open ended, to give free hand for the countries concerned to provide additional relevant key activities and information on responsible institutions and supporting legislation. At the onset, the Meeting also agreed that additional key activities such as “stock assessment” and “ecosystems health monitoring” should be included in the matrix on Monitoring (M).

17. The draft survey forms to initiate a “Vessel record and inventory” was introduced to the meeting and there were some general references by participating countries on their practices with regards vessel registration and fishing licenses for vessels, gears and/or fishermen. Without providing any clear directions on steps forward, there was a common understanding that it would be important to develop a vessel record and inventory for the sub-region. A concrete suggestion was to use the forms and insert available information in connection with on-site training to be held at provincial level among Andaman Sea countries.

18. There is common understanding that “Port monitoring” is something that would be of increasing priority and special reference was made during the meeting to the “final” version to the requirements for Port State Measures, EU requirements for catch

documentation (to be applied from 1 January 2010) and of a more local nature to the landings of fish that is being done in “neighbouring countries”. The survey form to assess the types of information that would be available in connection with port monitoring was not directly discussed by the meeting but the forms could be a useful tool to explore (and insert) available information in connection with on-site training to be held at provincial level among Andaman Sea countries.

Recommendations:

- (1) To further explore options to establish a MCS-network for the Andaman Sea region by initially focus on the sharing of information.
- (2) Further develop the matrix on key activities related M, C and S, respectively, to indicate responsible institutions and supporting legal documents.
- (3) Explore the extent of implementation of MCS by the countries in the Andaman Sea Sub-region, and initiate cooperation among the relevant countries for the implementation of MCS.
- (4) Explore possibilities to build local MCS systems at community level including incorporation of traditional knowledge and local organization.
- (5) Provide the relevant inputs into the Vessel Record and Inventory Survey Form (Larger Registered Fishing Vessels) and also into the Vessel Record and Inventory Survey Form (Coastal Fishing Vessels/Boats), as well as information for the Port Monitoring and Landing Site Monitoring.
- (6) Provide inputs to the survey forms the process to enter required information, as available, in should be included as elements for on-site training events at provincial level in countries around the Andaman Sea.
- (7) Provide capacity building on MCS at national, provincial and local level and build upon the forms for “vessel record and inventory” and “port monitoring” in the process.
- (8) Include “ecosystems health” and “stock assessment” among monitoring activities.

3.3 *Capacity Building, Climate Change and Local Knowledge*

19. The Meeting took note of the introductory presentation by the representative from ICSF, Mr. Sebastian Mathew (**Annex 10**) on how local knowledge and traditional institutions are referred to in international conventions and instruments, including the code of conduct for responsible fisheries. Following that there was a presentation by the RFPN Member for Malaysia, Mr. Yusri bin Yusof on the lessons learned from the workshop on customary institutions held in Lombok, Indonesia (2 – 5 August 2009) including references to some of the major local customary institutions in Indonesia. Furthermore, the presentation included a short introduction to the local organisation developed in La-Ngu District in Satun Province, Thailand. (**Annex 11**).

20. A general recognition is that local knowledge, traditional practices and local organisations could provide important in the development of M, C and S at local level specifically on the monitoring and control as indicated by experiences in Indonesia and

La-Ngu District in Satun as well as from earlier references to the CHARM project in Thailand.

21. The Meeting also noted the perceived impacts of climate change to the fisherfolk and fishery resources which was presented by SEAFDEC Advisor, Dr. Magnus Torell (**Annex 12**), where he suggested certain areas that would need attention to mitigate climate change linking these with the overall efforts in improving fisheries and coastal management for food security.

22. Local knowledge, traditional practices and local organisations are important factors to build upon when building up capacity to adapt to climate change and in efforts to mitigate effects caused by climate change, such as impact from storms, typhoons, floods, etc

23. Climate change cuts across all aspects related to fisheries and habitat management as including social development. It was noted that actions needed to improve fisheries and habitat management, maintain ecosystems health and increased resilience among coastal and inland fishing communities would also be relevant to address impacts of climate change and building up adaptive capacity. It is important to find or develop suitable indicators to report results of actions implemented and to train people and project staff to include perspectives of climate change in the regular reports.

24. Capacity building is considered another cross-cutting matter that needs to be addressed continuously at all levels. Recommendations on capacity building needs has been made in each of the sections throughout the Meeting, including aspects integration of fisheries and habitat management, MCS and MCS networks, vessel records, port monitoring, local/traditional knowledge, climate change and how to report in perspective that shows efforts made in response to perceived impacts of climate change. These aspects would be important to include in on-site training and dialogue events.

Recommendations:

- (1) Develop area management systems based on success stories of community involvement in fisheries management using traditional practices (*e.g.* those in Indonesia and Thailand), to be integrated into fisheries management planning and regulations where the roles of all stakeholders are clearly defined.
- (2) Put more emphasis on the needs of the local communities, *e.g.* communication and accessibility and transparency on the part of the government.
- (3) Address the need for capacity building through on-site training for local communities in the Andaman Sea Sub-region and in the process recognise the need to ensure improved understanding among government agencies on aspects of local knowledge and local organizations as applied in community-based fisheries management.
- (4) Facilitate the implementation of action to enhance resilience and to improve capacity to adapt to the effects of climate change and increased unpredictability of weather patterns. Furthermore, build up the ability, at various levels, to understand the impacts of climate change and links to fisheries and habitat management

- (5) Underline the impact of climate change on the acidification of the oceans which could affect the food chain and the importance to refer to oceanographic factors and changes over time.

3.4 Introduction of key partners and formulation of future plans for cooperation

25. As one of the key partners of SEAFDEC and the SEAFDEC-Sida Project, the BOBLME project was presented by the Chief Technical Adviser of the BOBLME, Dr. Rudolf Hermes (**Annex 13**). The BOBLME project is aimed at establishing strategic action program to address the critical fisheries management and environmental health-related issues in the Bay of Bengal which include over-exploitation of the fishery stocks, habitat degradation, land-based pollution which have lead to uncertainties on whether the ecosystem would be able to support livelihoods in the future. Considering that the Andaman Sea is a relatively well-defined marine eco-region within the BOBLME, the Andaman Sea Sub-region could benefit from coordinated efforts in project implementation between the SEAFDEC-Sida and BOBLME projects based on an ecosystem approach to fisheries (e.g. in fisheries and critical habitat management and promotion of harmonised policies). With regards to the area covered by the BOBLME in the Andaman Sea area, it has been agreed with participating countries that the limit in the Malacca Straits would be the “One Fathom Bank”.

26. Another key partner project, Mangroves for the Future (MFF): Investing in Coastal Ecosystems (**Annex 14**) was introduced by Dr. Don Macintosh, Coordinator of the MFF Project of the IUCN Asia Regional Office. With India, Indonesia, Malaysia, Seychelles, Sri Lanka, and Thailand as focal countries, MFF identified areas where it could contribute to the promotion of the objectives and activities proposed by the SEAFDEC-Sida Project. Considering that MFF works on coastal ecosystem rehabilitation, MFF could help the SEAFDEC-Sida project in developing indicators for assessing the coastal ecosystem health. Moreover, cooperation could be forged in the promotion of community-based habitat and fisheries management, development of climate change adaptation strategies, application of traditional knowledge and scientific-based information in support of habitat and fisheries management, among others.

3.5 Discussion and recommendations on the geographical coverage of the Andaman Sea

27. The Meeting discussed the delimitation of the Andaman Sea for the purpose of fisheries and habitat related cooperation in the Andaman Sea Sub-region and a map of the region (**Annex 15**) indicating the political boundaries (extent of the EEZs) and other references such as sub-areas of Area 57 as defined by FAO (and SEAFDEC) for purposes of reporting fisheries statistics. One important factor in deciding the geographical coverage was that the SEAFDEC-Sida Project would benefit if the area was aligned with that of the BOBLME. In practical terms indications had to be made on how far down the Malacca Straits to reach. The Meeting agreed that, in line with the BOBLME, to extend the project area down south to the “One Fathom Bank” which in project implementation terms would mean also to include the Indonesian Province of North-Sumatra and the Malaysian Province of Selangor (as recommended by the Meeting).

28. On the western side of the Andaman Sea on the question on where, possibly with the Andaman and Nicobar Islands as the western “divider”, the Meeting suggested that there would not be any immediate need to make a clearly defined western boundary for purposes of the SEAFDEC-Sida Project. The logic of this lies in the cooperation with the BOBLME in that in areas of the western part of the Andaman Sea trans-boundary cooperation on important stocks (*Hilsa* spp.) and other aspects cooperation would need to include Myanmar, India and Bangladesh (and extend into the Bay of Bengal) which is well with the remit of the BOBLME. Similarly, aspects of cooperation in the Andaman Sea between Indonesia and India would need to also to extend into the Bay of Bengal, again within the remit of the BOBLME.

29. In practical terms for the implementation of the SEAFDEC-Sida Project the focus will be to invite (in cooperation with the BOBLME) all five Andaman Sea countries for sub-regional meetings such as the one Phuket and other sub-regional meetings as defined from time to time. As for on-site training, trans-boundary dialogue, etc there will be a focus of the SEAFDEC-Sida Project on the eastern part (again in cooperation with the BOBLME) in principle, initially targeting two larger areas namely 1) the area South of Phuket down the Malacca Straits to Selangor and North Sumatra (One Fathoms Bank) and 2) the area North of Phuket up along the Coast of Myanmar and Myeik/Mergui Archipelago. The anticipation (from the SEAFDEC-Sida Project) is that for more area specific activities, on-site training, etc the BOBLME would be instrumental (as practical with cooperation from SEAFDEC and the SEAFDEC-Sida Project) in areas of the North-western part of the Andaman Sea where cooperation would need to include Myanmar, India and Bangladesh and with respect to cooperation in the South-western Andaman Sea between Indonesia (Banda Aceh) and India.

30. To maintain a reference to the “fishing areas” established by FAO (and SEAFDEC) the area would be within the FAO Fishing Area 57: 57a (marine fishing area of Myanmar), 57b (marine fishing area of Thailand in the Indian Ocean), 57c (marine fishing area of Malaysia in the Andaman and Malacca Straits), 57d (marine fishing area of Indonesia in the Malacca Strait), and the area around the Andaman-Nicobar Islands (57.check the specifics). These references should be seen in the context of the implementation focal areas of SEAFDEC-Sida and BOBLME respectively as referred to in points 26 – 28 above.

31. A question was made by the BOBLME to India on the possibility of sub-dividing the EEZ around Andaman and Nicobar Islands into one Andaman Sea part and one Bay of Bengal part to highlight or more easily collect information relating to the Andaman Sea “eco-region”. For the time being this would not be possible as the data is aggregated for EEZ as one entity.

32. Furthermore, it was also suggested that due coverage should extend into deltas, rivers, etc as practical to address the connectivity between rivers and marine areas in terms of productivity and more specifically for the anadromous migration of species like *Hilsa* spp.

IV. FOLLOW UP ACTIONS AND LINKS TO SEAFDEC, SEAFDEC-SIDA PROJECT AND OTHER MAJOR INITIATIVES INCLUDING WRAP-UP AND RECOMMENDATIONS

33. The Meeting was informed that the SEAFDEC-Sida Project would provide a venue for the promotion of cooperation mechanisms for the integration of fisheries and habitat management as well as management of fishing capacity. In this regard, collaboration would be called for not only among fisheries agencies in the Andaman Sea Sub-region but also among and with other institutions responsible for the sustainable development of fisheries, the management and restoration of habitats, as well as the improvement of the livelihoods of the fishing communities in the Sub-region.

34. Moreover, the Meeting agreed that the MCS Network should be developed for the Andaman Sea Sub-region, where each relevant country should identify the institutions working on M, C and S, respectively and provide information on the relevant laws and regulations. From such information, the common concern, concept, practice or common legal framework would be synthesized to form a basis for the development of the MCS Network for the Andaman Sea Sub-region.

35. Furthermore, the Meeting also agreed that a network on *Refugia* should be initiated for the Andaman Sea Sub-region taking into consideration the *refugia* network of the ASEAN under the UNEP/GEF/South China Sea Project, and the efforts of India (in the Andaman-Nicobar Islands) as well as those of BOBLME and MFF in the development of *refugia* in the Andaman Sea area.

36. The Meeting was further informed that at the onset of this SEAFDEC-Sida Project, efforts could be built upon information exchange and capacity building under joint arrangements (cross-country) or individual countries as the case may be. Through the establishment of focal points (focal persons) from the participants (participating countries) in this First Meeting, efforts should be made to provide inputs into the matrix for the M, C, and S as well as on the forms provided during the Meeting. Such inputs would be used as working documents during the series of on-site training which could be conducted at the provincial, national and sub-regional levels.

37. Based on the discussions and recommendations made by the meeting (as reflected above) an indication on potential activities and follow-up actions for the SEAFDEC-Sida project in the Andaman Sea Sub-region could include the following items (note that dialogue with the BOBLME will be maintained in the process). The points indicated below will be further specified after the BOBLME Inception Meeting 3 – 5 November 2009:

- Work will be implemented to further develop and complete the inventory of existing management areas and zones established for purposes ranging from environmental protection, fisheries resources conservation, heritage to traffic separation schemes for shipping and safety zones around off-shore installations (oil rigs, etc). In the process contacts will be made with the focal points among participating countries to provide information and feedback to the SEAFDEC-Sida Project on the inventory of “management areas”, “conservation zones”, etc. A focus will be given to the Andaman Sea region in developing the inventory.

- Information will be gathered on sources of information on important habitats (including sea mounts) throughout the Andaman Sea region by dialogue with the countries around the Andaman Sea and through contacts with organizations such as IUCN, WWF, Wetlands International, etc. Due consideration will be given to the importance of estuaries, deltas and river systems to the productivity of the Andaman Sea as well as of its importance as a main source of aquatic production. Furthermore, factors such as climate change that lead to distribution shift and production fluctuations of important fishery resources should be assessed
- Initiate development of management measures, including the sharing of information on biological, social, economical, oceanographic, and other (scientific) data for *Rastrelliger* spp. and related species highlighting the need for and design of regulatory measures, considering that these fishery resources are shared by Thailand, Indonesia and Malaysia (on the southeast Andaman/Malacca Strait) and Myanmar and Thailand (in the Northeast Andaman). At the onset work will be done to trace available information on migration and life-cycle patterns.
- The SEAFDEC-Sida project will promote fisheries *refugia* as a tool for fisheries resources conservation and the management of the whole life cycle of important fishery resources. In the process incorporate and build upon MPAs and other management schemes in developing the *refugia* zoning in accordance with the criteria provided above and below.
- Develop a glossary of the terms used by Andaman countries with reference to the national definitions as stated in laws and regulations (if available) to see if this could be synthesised into a common set of definitions or at least come up with common reference points that could be used in the process of the establishment of fisheries resources conservation areas. In the process also take into consideration definitions provided by IUCN and other international organisations
- In all aspects relevant the SEAFDEC-Sida will make efforts to, initially, assess areas of compatibility of national regulations as a tool for cooperation and specifically point at the need for flexibility to allow for the integration of fisheries management with habitat management
- The SEAFDEC-Sida Project will further develop the matrix on key activities related M, C and S, respectively, to indicate responsible institutions and supporting legal documents in cooperation with national focal points. “Ecosystems health” and “stock assessment” will be included among “monitoring activities”
- Further explore the extent of implementation of MCS by the countries in the Andaman Sea Sub-region, and initiate cooperation among the relevant countries and institutions to initiate a MCS network, initially focusing on sharing of information. In the process possibilities to build local MCS systems at community level including incorporation of traditional knowledge and local organization should be assessed.
- The SEAFDEC-Sida will continue to gather relevant inputs into the Vessel Record and Inventory Survey Form (Larger Registered Fishing Vessels) and also into the Vessel Record and Inventory Survey Form (Coastal Fishing Vessels/Boats), as well as information for the Port Monitoring and Landing Site Monitoring.
- A sequence of on-site training events will be organized by the project (in cooperation with BOBLME) during 2010 and 2012 that will address capacity building on MCS at national, provincial and local level and work with the forms for “vessel record and inventory” and “port monitoring” in the process as well as

on the “integration of fisheries and habitat management” (for the BOBLME with an emphasis on the latter part).

- More emphasis will be given to the needs of the local communities, *e.g.* communication and accessibility and transparency on the part of the government and incorporate that in the capacity building through on-site training for local communities in the Andaman Sea Sub-region, as well as consider also capacity building for government agencies on local knowledge and local organizations as applied in community-based fisheries management
- The sequence of on-site training will also include capacity building to improve capacity to increase resilience and capacity to adapt the effects of climate change and increased unpredictability of weather patterns, and to increase understanding of the impacts of climate change and links to fisheries and habitat management

38. As indicated by the meeting SEAFDEC will apply the following criteria in defining suitable fisheries resources conservation areas (refugia): The area should be large enough to include and to protect trans-boundary habitats and migratory species “embracing” a number of existing defined management areas. The more specifically defined size of the area should gradually be developed through consultative processes involving coastal villagers, the traditional users of the resources, researchers, local and central authorities and other stakeholders, taking into consideration the following factors:

- a) To build upon an aggregation of smaller management areas (established for local fisheries, fisheries resources protection, habitat management and/or other purposes)*
- b) To recognise the existing zoning schemes (like trawling free zones)*
- c) To take note of the seasonality in fishing, fish migration/spawning, etc*

Focus could, tentatively, be on four, very broad areas: 1) From Phuket down to the One Fathom Bank (Selangor and North Sumatra); 2) From Phuket up along the coastline of eastern Myanmar and the Myeik/Mergui Archipelago; 3) Western part of Myanmar, Bangladesh and India (including northern Andaman and Nicobar Islands); 4) India (Southern Andaman and Nicobar Islands) and Indonesia (Banda Aceh). For the SEAFDEC-Sida project prime focus will on 1) and 2).

39. Geographical coverage: In line with the recommendations from the Meeting, and to be in line with the BOBLME the project area in the Malacca Straits will extend down south to the “One Fathom Bank” which in project implementation terms would mean also to include the Indonesian Province of North-Sumatra and the Malaysian Province of Selangor (as recommended by the Meeting). On the western side of the Andaman Sea there will not be any clearly defined western boundary for purposes of the SEAFDEC-Sida Project. Through the cooperation with the BOBLME activities in the western part of the Andaman Sea that would require including areas “beyond” the Andaman Sea would be covered by the larger geographical coverage by the BOBLME.

40. In practical terms for the implementation of the SEAFDEC-Sida Project the focus will be to invite (in cooperation with the BOBLME) all five Andaman Sea countries for sub-regional meetings such as the one Phuket and other sub-regional meetings as defined from time to time. As for on-site training, trans-boundary dialogue, etc there will be a focus of the SEAFDEC-Sida Project on the eastern part (again in cooperation with the BOBLME) initially targeting two larger areas namely 1) the area South of Phuket down the Malacca Straits to Selangor and North Sumatra (One Fathom Bank) and 2) the area

North of Phuket up along the Coast of Myanmar and Myeik/Mergui Archipelago. The anticipation (from the SEAFDEC-Sida Project) is that in more area specific activities, on-site training, etc in the western part of Andaman Sea the BOBLME would be instrumental (as practical with cooperation from SEAFDEC and the SEAFDEC-Sida Project), such as in areas of the western part of the Andaman Sea where cooperation would need to include Myanmar, India and Bangladesh and with respect to cooperation in the Andaman Sea between Indonesia (Banda Aceh) and India.

41. The Meeting was informed that the Report of the First Meeting of the Andaman Sea Sub-region incorporating the recommendations would be finalised taking into consideration further comments from the resource persons and participants of the Meeting. An early draft of the final Report will be used by SEAFDEC to provide input by the SEAFDEC-Sida Project to the BOBLME Inception Meeting during the first week of November 2009 and revised as needed after that meeting.

42. Considering also that the Andaman Sea Sub-region is one of the sub-regional arrangements being considered under the ASEAN Fisheries Consultative Forum or AFCF, the recommendations raised during the First Meeting of the Andaman Sea Sub-region would also be submitted to the appropriate ASEAN meetings for policy support as well as to the annual review meeting of Sida and SBF for continued support. In general the Meeting had also been supportive in promoting awareness on the benefits of sub-regional cooperation in an area like the Andaman Sea region.

43. The representative from MFF reiterated the areas of cooperation that could be forged between MFF and the Andaman Sea Sub-region, such as capacity building (individual countries and institutional capacity building) and climate change adaptation strategies. Specifically, since MFF is not directly working with the Andaman-Nicobar Islands, MFF can work towards achieving such goal through India under the Andaman Sea Sub-regional arrangements. In addition in order that MFF would be able to assist Myanmar through Thailand, the SEAFDEC-Sida Project could serve as the facilitating institution and operationally through the BOBLME in promoting such cooperation. Moreover, since FAO is also active in the fisheries sector of Myanmar specifically in mangrove conservation and aquaculture, cooperation could also be strengthened through the BOBLME project and specifically through the SEAFDEC-Sida Sub-regional project.

44. The representative from BOBLME informed the Meeting that since the five relevant countries of the Andaman Sea Sub-region are also members of BOBLME, the BOBLME would offer a platform for the implementation of the recommendations raised at this Meeting.

45. The Meeting also agreed that adaptations to climate change should not be considered as standalone project, and concurred with the suggestion of MFF that the highlights on climate change adaptations should be considered as cross-cutting issue and that climate proofing should be considered in the activities that will be planned and implemented under the Andaman Area Sub-region project.

V. CLOSING OF THE MEETING

46. SEAFDEC Senior Advisor, Dr. Magnus Torell expressed his appreciation to the resource persons and participants for their active participation in the Meeting, and declared the Meeting closed. On behalf of the participants, the representative from India thanked the organizers for the arrangements of the Meeting.

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OPENING REMARKS

By Dr. Chumnarn Pongsri
SEAFDEC Secretary-General

Representatives from our collaborating partners and relevant countries in the Andaman Sea area, Representatives from the SEAFDEC Secretariat and Training Department, Members of the Regional Fisheries Policy Framework, Ladies and Gentlemen, a very good morning!

On behalf of SEAFDEC and the SEAFDEC-Sida project, I am pleased to welcome you all to the First Meeting of the Andaman Sea Sub-region to discuss ways and means of promoting the sustainability of fisheries in this Sub-region. As you may be already aware of, SEAFDEC with support from the Swedish International Development Cooperation Agency or Sida has embarked on a project early this year, focusing on the development and management of fisheries in the Andaman Sea Sub-region. This project specifically aims to achieve the long-term sustainability of fisheries and mitigate the impacts of climate change on the livelihoods of the fisherfolk in the Andaman Sea area.

Moreover, you may be also aware that Southeast Asian organizations like the ASEAN and SEAFDEC have provided opportunities for discussions among the countries in the region on the aspects of fisheries development, economic cooperation, and social development. This led to the development of the ASEAN Fisheries Consultative Forum or AFCF where sub-regional management arrangements are being considered to accommodate management needs, habitat functions, and types of fisheries in a defined water area. Nevertheless, the need to supplement the regional management mechanism covering the inland and marine areas of the whole ASEAN with arrangements at sub-regional levels has also been considered, to better address area-specific issues such as habitats, fish species and trans-boundary potential conflicts. Six sub-regional areas in Southeast Asia have therefore been initially identified, namely: Gulf of Thailand, Andaman Sea, Timor-Arafura Sea, Southern and South Easter South China Sea and Sulu-Sulawesi, Northern South China Sea and the Gulf of Tonkin, and the Lower Mekong River Basin. The continued and strengthened dialogue and cooperation at the sub-regional levels would therefore contribute to the achievement of the objectives of the AFCF.

The SEAFDEC-Sida Project has already initiated the process of promoting sub-regional management arrangements starting with the Gulf of Thailand through the sub-regional meetings in 2008 and 2009. However, considering that the main features of the Andaman Sea vary from those of the Gulf of Thailand, this meeting would therefore explore options for laying the foundation of larger fishery resources conservation areas in coordination with the relevant countries around the Andaman Sea. We have coordinated with the Bay of Bengal Large Marine Ecosystem Project or BOBLME for this meeting to learn from their experience and avail of their expertise in the area of large *refugias* and other relevant aspects of fisheries and habitat management in the Andaman Sea area. In our discussions, we could also refer to the recommendations made during the series of meetings on the Gulf of Thailand in drawing up the suitable management actions for the Andaman Sea Sub-region.

At this juncture, on behalf of the organizers of this meeting, we wish to express our gratitude to all the participants, especially the representatives from our collaborating partners for travelling all the way to the beautiful island of Phuket to take part in this very significant meeting. Your active participation would surely enhance the cooperation that we have initiated for the promotion of sustainable fisheries in the Andaman Sea area thus, also achieving the objectives of this meeting. With that note ladies and gentlemen, I now declare the First Meeting of the Andaman Sea Sub-region open.

Thank you and good day!

PROSPECTUS

INTRODUCTION

Fishing communities, fisheries resources, important marine habitats and coastal environment are under increasing pressure throughout the world. The Andaman Sea region is no exception. The increased pressures stems from different sources such as over-fishing (including illegal fishing, over-capacity and conflicts between groups of fishermen), degraded coasts and marine environment, increased demand for land in coastal areas and effects of climate change (including storms, typhoons, etc).

Many coastal communities are facing, and will be facing, increased unpredictability of natural hazards such as cyclones and storm surges that in severe cases causes deaths of fisher-folk including loss of fishing and aquaculture assets and related onshore infrastructure. This in turn reduces the ability of households to earn income and sustain livelihoods as was experienced from the Tsunami and the cyclone Nargis. The effects of these natural events directly relate to the life of local fishermen and their families, to fisheries resources, to the environment and to important habitats. The impacts of the more frequent and intense natural hazards should be recognized together with changes in their pattern due to climate change. The experiences from the larger scale disasters should be brought forward in terms of showing the increased vulnerability to coastal communities and coastal resources due to depletion and destruction of important coastal habitats (mangroves, coral reefs, sandy beaches, etc). The importance to restore some of these biogeographical features should be highlighted both in terms of the protection it provides – and to ensure healthy habitats for spawning and nursery to maintain the fisheries resources.

An eco-systems approach through the integration of habitat and fisheries management to better manage coastal environments, including coastal restoration as needed is important as a protection against future hazards while at the same time provide an important element to the sustainability of the fisheries by securing important habitats. The need to integrate fisheries management into habitat management is one of the key messages that emerged during the initial phase of SEAFDEC-Sida cooperation. This is now well appreciated by ASEAN-SEAFDEC Member Countries. It is recognised as a cornerstone in the plans to promote sub-regional cooperation, while incorporating approaches to establish *refugia* (fisheries resources conservation areas) and thereby embracing the importance of eco-systems approaches also to fisheries management. Work in this direction is already initiated in the Gulf of Thailand and the South China Sea. To embark upon a similar process in the Andaman Sea there is a need a) to revisit the process of criteria setting and boundary definition for areas to be selected; b) to review management systems in the areas and map existing defined areas/zones; c) to cooperate and link up with projects and organisations building up information on spawning, nursery and other important coastal habitats; and d) to promote and build awareness at various *fora* on the need to integrate fisheries management into habitat management (and the institutional implications thereof) in line with the requirements of an ecosystems approach.

Review of management systems and mapping of existing defined areas/zones need to be an on-going activity. A general finding from other regions is that there are many different

“management” zones established – with little or no coordination, be it for fisheries, environment, natural heritage or wildlife sanctuary purposes. The boundaries are often not clear and it is confusing for fishermen and others on what rules to follow. Another major finding – or shortcoming – with many of the available schemes and zoning systems are that they are very site specific and the inter-connectivity (including migratory paths/corridors) are often overlooked when management efforts are implemented. It is important and timely to explore options to lay the foundation for the introduction of larger fisheries resources conservation areas (*refugias*) by initiating a dialogue with the countries around the Andaman Sea and it is recommended to look at the usefulness of agreements established in the region as a basis for sub-regional arrangements. Based on monitoring of spawning season, migration patterns etc the management need to include closing of fishing area during specific seasons and prohibiting some types of fishing gear and practices. A continued monitoring would also indicate observed needs to adjust the area to be closed due to slight changes in the movement fish – and reactions from the fishermen. These changes in movement could be indications of impacts of climate change and the adjustment to be seen as adaptation measures.

The problem of overcapacity and uncontrolled fisheries is another global concern. It is necessary to seriously consider, in cooperative manner, effective ways to improve the management of fisheries by controlling the active fishing capacity. The number of boats, small and large, needs to be recorded to be able to restrict fishing activities when and where needed – this also to be able to adjust and adapt to changes in resources availability due to climate change and to improve safety to mitigate problems to fishing boats caused by expected changes in the weather pattern. In efforts to improve sustainability attempts are being made by fisheries agencies and managers, to try to better control the active fishing effort, both large-scale and small-scale, in order to improve fisheries management and to reduce illegal, unreported and unregulated (IUU) and destructive fishing. The nature of fishing – and the migration of fish and the mobility of people and vessels involved in fishing – implies that there need to be a regional, sub-regional and/or bilateral dialogue on measures to take to improve fisheries management, control/manage fishing capacity, to build MCS Networks and to safeguard important habitats.

REGIONAL AND SUB REGIONAL COOPERATION

Global instruments like the UN Law of the Sea Convention (UNCLOS 1982), the Code of Conduct for Responsible Fisheries (CCRF) and other international agreements and instruments are all promoting regional and sub-regional discussions and agreements.

In Southeast Asia organizations like ASEAN and SEAFDEC have since many years provided a forum for dialogue among countries of the region in aspects related to fisheries, economic cooperation and social development. The process leading up to the ASEAN Fisheries Consultative Forum (AFCF) is a positive result of this dialogue. The last decade have seen the emergence of action oriented regional projects and initiatives, such as the UNEP/GEF Project “Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand” (UNEP/GEF SCS)¹ on habitat and fisheries

¹ UNEP/GEF SCS: addresses three priority areas of concern identified in during a long consultative process (based on a trans-boundary diagnostic analysis), namely: 1) The Loss and Degradation of Coastal Habitats; 2) Over-Exploitation of Fisheries in the Gulf of Thailand; and 3) Land-Based Pollution. Of these three substantive project components the first, relating to habitat degradation and loss is the largest, being divided into four sub-components (coral reefs, sea-grass, mangroves, and wetlands). A fourth component of the project is with regional co-ordination including facilitation of national level execution and securing inter-country agreement on project related matters (such as between Cambodia and Vietnam, and Cambodia and Thailand)

management; the Regional Plan of Action (RPOA)¹ to promote responsible fishing practices including combating IUU fishing in the region; and the SEAFDEC-Sida project promoting regional and sub-regional cooperation, promotion of the implementation of the Code of Conduct for Responsible Fisheries and recently including efforts to address climate change and adaptation. All three initiatives promote regional cooperation and prioritise sub-regional arrangements. Also the AFCF with its focus on both inland and marine fisheries implies that the ASEAN wide process needs to be supplemented by sub-regional initiatives. Neither UNEP/GEF/SCS nor the RPOA include the Andaman Sea. To give a more total coverage of sub-regional seas in Southeast Asia the SEAFDEC-Sida project is, beginning 2009, providing an initial focus on the Andaman Sea. Furthermore, with its initiation during 2009 the BOBLME will with its focus on the Bay of Bengal be able to provide important support to the sub-regional cooperation in and around the Andaman Sea².

Through SEAFDEC (and the SEAFDEC-Sida Project) there are positive experiences from the Gulf of Thailand on ways of initiating a process to promote sub-regional arrangements with SEAFDEC organising the first sub-regional meeting on the Gulf of Thailand, 28 – 29 March 2008 in Bangkok with Cambodia, Malaysia, Thailand and Vietnam. The meeting was successfully stressing the relevance of a sub-regional dialogue to integrate fisheries and habitat management relevant to an ecosystems approach. The meeting was also successful in bringing forward priority action points on MCS needs of relevance for the Gulf of Thailand. The results were reported to UNEP/GEF/SCS Fisheries Component and to the RPOA Coordinating Committee in April 2008. The report and work being done was lifted up by the RPOA as an example that could be followed by other sub-regions. Furthermore, the meeting highlighted other matters for cooperation, such as getting responsible legal experts together to “compare” fisheries and related laws, further develop the sequence of trans-boundary fisheries resources conservation areas (*refugias*) and to encourage efforts to be made to settle maritime boundaries within the Gulf of Thailand. The meeting was successfully followed up with a second Gulf of Thailand event, 24 – 26 February 2009 in Bangkok where countries agreed to move ahead with the MCS-Network, starting with a vessel record and inventory (this included references to a SEAFDEC hosted an “Expert Meeting on Fishing Vessel Registration” 30 June - 2 July in Phuket, Thailand). They also agreed on the importance to explore options of joint approaches to the conservation of smaller pelagics (like Indo-Pacific Mackerel (Pla Too) and related species).

Building upon the experiences from the Gulf of Thailand initiative will be important to achieve similar progress in and Around the Andaman Sea.

¹ The RPOA have stated that efforts to combat IUU fishing actions should cover “conservation of fisheries resources and their environment, managing fishing capacity, and combating illegal, unreported and unregulated fishing in the areas of the South China Sea, Sulu-Sulawesi Seas and the Arafura-Timor Sea”. This implies a clearly defined focus on sub-regions. In the RPOA meeting in Bali, 4-6 March 2008 (with focus on MCS issues), it was noted that the “South China Sea” as a unit to focus an action oriented approach was not really suitable as different parts would require some different approaches for management – and politically. Subsequently, the Gulf of Thailand was defined as a suitable “sub, sub-area”.

² The newly started BOBLME addresses the following key issues: 1) overexploitation of living resources, 2) critical habitat degradation, 3) land-based sources of pollution, and 4) the status of these critical habitats, and their ability to support livelihoods in the future.

ANDAMAN SEA AS “SUB REGIONAL” COOPERATION UNIT

The Andaman Sea can be considered as a “semi-enclosed sea” in correspondence to the UN Law of the Sea Convention in that it is “consisting entirely or primarily of the territorial seas and exclusive economic zones of two or more coastal states” (Article 122). The Andaman Sea is surrounded by four ASEAN Member Countries, namely Indonesia, Malaysia, Myanmar, and Thailand and India through the Andaman and Nicobar Islands that are forming the western boundary of the Andaman Sea.

The geographic and bottom features are quite distinct compared to the Gulf of Thailand. The area includes a large continental shelf in the northern part in the waters of Myanmar and a deep basin down to more than 3,000 m in the central part of the Andaman Sea. Many rip-currents occur where two water masses meet producing an abundance of small pelagic fishes in the offshore waters. This area has great biodiversity on its continental shelf and continental slopes as well as further offshore. Many commercial fish species thrive on the continental slopes where the depth varies between 150-300 m, and there is an abundance of fish species in the Ayeyarwaddy delta. Throughout the coastal areas of the Andaman Sea there are plenty of small fishing villages with people dependent on the abundant fisheries resources in the estuaries and the coastal waters featuring important ecosystems.

Seasonal changes such as the northwest and southeast monsoons are beneficial in terms of distribution of nutrients and should be considered when implementing efforts to reduce the rate of over-exploitation and to build up conservation measures to allow the fish stocks to recover. Changes in the seasonal pattern due to climate change would, subsequently, have impacts on the fisheries and the habitats as well as increased hazards and hardship to fishermen due to more unpredictable weather with instances of severe weather conditions as seen during the cyclone Nargis.

There is a general need to closely monitor new developments to ensure long term sustainable use of the area’s resources. To ensure the proper management it is important to develop coordination mechanisms for the integration and coordination of fisheries and habitat management and to manage fishing capacity. Andaman Sea challenges ahead include collaboration, not only among the fisheries agencies around the Andaman Sea, but also among and with other institutions responsible for the sustainability of fisheries resources, the management and restoration of habitats and for the improvement of livelihoods.

To initiate the process of cooperation around the Andaman Sea it could be advisable to try to pick up on the momentum of work and cooperative spirit developed around the Gulf of Thailand and in the ASEAN region as a whole and through the cooperation with the BOBLME ensure that also India (the Union Territory of Andaman and Nicobar Islands) can be involved from the beginning.

RATIONALE AND OBJECTIVES OF THE MEETING

As the background shows there is a momentum growing in the promotion of regional and sub-regional cooperation in Southeast Asia. SEAFDEC and the SEAFDEC-Sida project is well placed to build upon some of the issues – and opportunities – that has been identified as matters of common management challenges for Southeast Asia and the Andaman Sea

sub-region. Continued and strengthened dialogue and cooperation at the sub-regional level, in this case the Andaman Sea, will also be supportive of the process to establish an ASEAN Fisheries Consultative Forum (AFCF) by fostering common understanding and by addressing some fields of activities referred to in the work plan for the AFCF (May 2009).

The intention with this event is to provide a venue to explore options to lay the foundation for the introduction of larger fisheries resources conservation areas (*refugias*) by initiating a dialogue with the countries around the Andaman Sea. It is recommended that countries look at the usefulness of agreements established in the region as a basis for sub-regional arrangements. Furthermore, the event aims to review and to provide action oriented recommendations in the Andaman Sea context on key issues of regional concern, such as fishing capacity, IUU fisheries, vessel registration, etc. To initiate the Andaman Sea Process the meeting will follow up on items and recommendations identified during the March 2008 Gulf of Thailand Meeting to indicate suitable actions for continued work at the sub-regional level.

The ambition to invite participants from different agencies is an attempt to improve the dialogue, not only between countries, but also between key institutions involved in matters such as vessel registration and habitat management together with the more fisheries specific agencies. In summary, the SEAFDEC-Sida project will organise the meeting, with the purpose to provide a platform for countries around the Andaman Sea (Myanmar, Thailand, Malaysia, Indonesia and India) to review problems and suggest solutions on matters of importance to fisheries and habitat management, including fishing capacity, vessel record, MCS Networks, port monitoring, etc – and to explore the options to develop arrangements for cooperation and management around the Andaman Sea. Furthermore, the event will provide an opportunity to **introduce the new framework of the SEAFDEC-Sida Project** and the focus on the Andaman Sea, Climate Change etc. The meeting will also provide an opportunity to have an introduction to the BOBLME and through the support by the BOBLME opportunities have been provide to invite India to participate thereby having all Andaman Sea countries present.

EXPECTED OUTCOMES

1. Awareness raised among participating institutions from around the Andaman Sea on benefits of regional/sub-regional cooperation and inter-sectoral cooperation to promote appropriate fisheries management to achieve sustainable development (based on the outcome of the meeting as such);
2. Overall orientation provided on the SEAFDEC-Sida project framework including the objectives of the project and the BOBLME project;
3. A short background briefing provided on the experiences and recommendations from the Gulf of Thailand;
4. Issues reviewed and recommendations provided on fisheries and habitat management including aspects of trans-boundary and sub-regional cooperation around the Andaman Sea, specific feedback to be provided on (Agenda 3 and 5):
 - Definition/designation of (larger) fisheries resources conservation areas (*refugia*);
 - Ways recommended to survey existing “management areas” (zoning schemes, MPA’s, community fisheries, closed seasons, trawling free zones, etc) as an introduction to the review of existing management

- systems;
- Indications provided on known local/traditional management systems for fisheries and habitats (such as Paglima Laut, Banda Aceh, La-Ngu District, Satun, etc) (Agenda 3 and 5);
 - Recommendation provided on reviews of available information on important habitats;
 - Feedback provided on the relevance for the Andaman Sea to specifically look at the cooperation on *Rastrelliger Brachysoma*, Indo-Pacific Mackerel (“Pla Too”) and *Rastrelliger Kanagurta*, Indian Mackerel (“Pla Lang”) and related species as a suitable target for “sub-regional” arrangements
5. Options explored to initiate a process to establish a MCS network for the Andaman Sea, this would include recommendations on (Agenda 4):
 - Indications made on elements to be addressed in the process to establish a MCS Network for the Andaman Sea including the importance of information sharing;
 - The suitability of using the development of a “vessel record and inventory” as an initial field for cooperation (reference could be made to the recommendations from the March 2009 Gulf of Thailand meeting and the regional event, July 2009 on Vessel Record and Inventory);
 - As recommended by the July 2009 meeting on Vessel Record and Inventory (to be specified after the meeting) further comments provided to the forms for collection of information on small boats and larger vessels as to the applicability to the Andaman Sea Context;
 - Comments made and recommendations provided on the suggested “institutional matrix” on Monitoring, Control and Surveillance as relevant to the Andaman Sea;
 - Recommendations provided on landings by “neighbouring country” vessels and landing across boundaries (as a follow up to “port monitoring”) and the need to improve monitoring;
 - A feedback provided by the Andaman Sea countries on the relevance of the shortened definition on the “Illegal”, the “Unregulated” and the “Unreported” or IUU fisheries as developed during the Gulf of Thailand meeting in March 2009.
 6. Recommendation on steps to take to provide a broader understanding on the context of legal and regulatory framework among the Andaman Sea countries including recommendations on the clarifications/improvement of legal aspects of fisheries and habitat management (Agenda 5);
 7. General points provided on the need for capacity building at province and district level around the Andaman Sea to be referred to in planning for on-site training in identified areas (Agenda 5);
 8. Identified general needs of capacity building, capacity to increase resilience and capacity to adapt to effects of climate change and increased unpredictability in seasonal weather patterns, including, or perhaps initially, indications on the need to increase the understanding of climate change and fisheries/habitats and the various fields where adaptive measures could be applied (if capacity and resources would be available) (Agenda 5);
 9. Explore and recommend on mechanisms to cooperate with partners such as BOBLME, Mangroves for the future, Mangrove Action Project, FAO/APFIC (Agenda 6 and 8);

10. Indications provided by participants on steps to take to initiate a continuation of the process of establishment of sub-regional cooperation/arrangements based on the results of this meeting (Agenda 6 and 7);
11. Indications provided on continued cooperation with the BOBLME including practical steps to be considered to maintain coordination with India and specifically the Union Territory of Andaman and Nicobar Islands as well as BOBLME Partners in the four ASEAN countries. (Agenda 6 and 7).

AGENDA

- Agenda 1 Opening of the Meeting
- Agenda 2 Background of the Meeting, introduction of the SEAFDEC-Sida project, Adoption of the Agenda and Arrangement of the Meeting
- Agenda 3 Integration of fisheries and habitat management, fisheries resources conservation areas (*refugia*)
- Agenda 4 Monitor, Record and Control, MCS Network, Vessel Record and Inventory
- Agenda 5 Local knowledge, Climate Change, ecosystem health and cross-cutting issues (capacity building)
- Agenda 6 Introduction of the BOBLME and formulation the future plan for the coordination among countries and cooperation with other initiatives such as BOBLME, Mangroves for the Future, Mangrove Action Project and FAO/APFIC
- Agenda 7 Geographical coverage of the Andaman Sea
- Agenda 8 Follow up actions and links to SEAFDEC, SEAFDEC-Sida project and other major initiatives
- Agenda 9 Wrap-up and recommendations
- Agenda 10 Closing of the Meeting

INTEGRATION OF FISHERIES AND HABITAT MANAGEMENT, FISHERIES RESOURCES CONSERVATION AREAS (*refugia*) – AN ECOSYSTEMS APPROACH

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Organization of this document

1. Introduction to the building up of fisheries resources conservation areas (*refugia*) in the context of ecosystems management
2. Recommendations and criteria for Fisheries Resources Conservation Area
3. Aspects for the Meeting to discuss and recommend
4. A brief introduction based on the initial review of management areas in the Andaman Sea ASEAN Andaman Countries

1. Introduction to the building up of fisheries resources conservation areas (*refugia*) in the context of ecosystems management

Fishing industry has been keen to identify the problems behind the unprecedented low levels of fish in recent years. It is clear that overfishing has impacted on the ecosystem works and the availability of fish. Rebuilding of fish stocks can only be achieved by understanding all of the influences, human and natural, on fish dynamics. Fishing, however, is not the sole perpetrator of changes to marine life - such as degraded coasts and marine environment, increased demand for land in coastal areas and effects of climate change are also increasing pressure upon fisheries resources. No one factor operates in isolation and components of the ecosystem respond differently to each individual factor. The importance to restore the coastal habitats should be highlighted both in terms of the protection it provided-and to ensure healthy habitats for spawning to maintain the fisheries resources.

Aware of the increasing pressures and negative impacts on aquatic environment and fisheries resources by fisheries and non- fisheries activities, ASEAN-SEAFDEC Member Countries are trying to exercise several management programs to solve the negative impact through an ecosystems approach. In this regard, the integration of habitat and fisheries management including coastal restoration as needed is important as a protection against future hazards. The function will also provide an important element to the sustainability of the fisheries by securing important habitat. Furthermore it implies

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cooperation among institutions such as fisheries and environmental//coastal resources agencies.

All around the Andaman Sea countries have established schemes and zones to protect important habitats, fisheries resources, spawning grounds and other areas of special importance. Depending on the purpose and national legal framework a broad range of institutions are involved in the management of designated areas, such as fisheries departments, forestry departments, departments for environment, departments for marine and coastal resources, provincial and local authorities, etc. Established zones are often fairly site specific and of limited size. To effectively integrate fisheries and habitat management, and to address the ecosystems including aspects of interconnectivity (fish migration, etc) the already defined areas would in many cases be too small. The response would be to identify somewhat larger fisheries resources conservation areas – or *refugia* – that could build upon an aggregation of smaller management areas (established for fisheries, habitat management or other purposes) as has been recommended and referred to below (section 2).

As a basis to define suitable larger management areas and the opportunities to build upon already established zones there is a need to survey the various types of existing zones or management areas in and around the Andaman Sea. In coming stages SEAFDEC will try to provide a summary map of existing zones and schemes in countries around the Andaman Sea. At this stage, through a brief search on the internet, a list is provided on various types of management areas in the Andaman Countries as an introduction to the range of existing management schemes together with their purpose and institutions responsible for the management. The range of existing management schemes include areas or zones such as areas/zone reserved for traditional/artisanal fisheries (trawling free zones), Marine Protected Area, heritage sites, Man and Biosphere areas, seasonal closure during critical periods, wildlife sanctuaries, safety zones around shipping lanes and structures in the sea (oil rigs, etc), community fisheries/traditional management areas, etc.

Below in section 4 there is brief list of the initial review of management areas in the Andaman Sea. Through the survey and references to some of the web sites it is important to note that many important areas for fisheries, habitat and ecosystems are identified in border areas and stretches across boundaries, such as between Myanmar and Thailand, Thailand, Malaysia and Indonesia, Indonesia and India and India and Myanmar. These areas could well be identified for the establishment of larger ecosystem management areas.

2. Recommendations and criteria for Fisheries Resources Conservation Area

Through a sequence of meetings and consultations discussions has been held on the perspective of fisheries resources conservation and management and more specifically how to integrate fisheries management into habitat management and the designation of fisheries resources conservation areas (*refugia*). The sequence includes meetings with the UNEP/GEF South China Sea Project, FAO Bangkok, a special session at SEAFDEC 2 July 2007 and a further feedback provided during the meeting of the UNEP/GEF South China Sea Project Fisheries Working Group on Phu Quoc, Vietnam, 10 – 13 July 2007. The question has been continuously discussed in other events during 2008 and 2009.

In general it would be useful to apply a management area that cover a larger geographical space than what is common for habitat management, local fisheries management areas and most of the candidate *refugia* sites (under the UNEP/GEF/SCS) thereby allowing for these “smaller” areas to be incorporated into a larger “fisheries resources conservation area”. This would help to strengthen the existing management effort in these areas. This would also allow for a more comprehensive integration of fisheries into habitat management by making it possible to have different types of habitats, including various stages of the life cycle of fish and the interconnectivity (migration path) into the same management framework. Another benefit would be that it would be possible to start to assess – also in economic terms – the value of habitats to the fisheries outside of the habitat or string of habitats.

Recommendations were established to work on the development of larger fisheries management conservation areas. The main criteria are:

- To build upon an aggregation of smaller management areas (established for local fisheries and/or habitat management)
- To recognise the existing zoning schemes (like trawling free zones)
- To take note of the seasonality in fishing and fish migration/spawning, etc.
- Identify management purpose (prevention of destructive gears, protection of habitats/seabed for sedentary non migratory species; protection of critical habitats spawning nursing grounds for migratory species, limitation of effort, preservation of rights/limitation of access)
- Identify scale and the effect which is intended
- Identify the linkages between the small & medium size areas or medium and large size areas
- Take note and build upon, as applicable or available, rules and regulations established for management of fisheries, habitats and/or environment
- Build social and traditional aspects into planning and design

Elements of a larger management area

1. A large scale management area could be made up of an aggregation of small areas (e.g. a stretch of coastline with a near-shore management area which comprises of a series of community/district management zones – that could be linked to stretches in neighbouring provinces and/or countries).
2. Alternatively – a string of management areas/ habitats which are linked through their relationship to a stock’s different stages of its life-cycle. (an example - in rivers this would be called the “string of pearls” of protected habitats spaced along the length of a river.
3. A similar example would be “pockets” of habitat along a coastline – individually providing local benefits but also provide a string of habitats.
4. Combinations of 1, 2 and/or 3
5. most countries have a near-shore artisanal fishing “zone” or limit (excluding trawlers and push-netters), which are generally poorly enforced and a continued source of conflict – in fact the focus on rights and community level fisheries is in part a response to the fact that the artisanal fishing zone is so poorly enforced that these alternative approaches may become more effective at reducing conflict in localized areas.

3. Aspects for the Meeting to discuss and recommend on:

- Ways to more comprehensively survey existing “management areas” (areas/zone reserved for traditional/artisanal fisheries (trawling free zones), Marine Protected Area, heritage sites, Man and Biosphere areas, seasonal closure during critical periods, wildlife sanctuaries, safety zones around shipping lanes and structures in the sea (oil rigs, etc), community fisheries/traditional management areas, etc) as an introduction and basis for the review of existing management system.
- Availability of maps with the boundaries of the various management areas and restricted zones.
- Indications that could be provided on known local/traditional management systems for fisheries and habitats, such as Paglima Laut, Banda Aceh, La Ngu District, Satun, etc.
- The value of the recommendations and criteria for establishing larger Fisheries Resources Conservation Area (*refugia*) while building upon already established management areas (MPAs, heritage sites, closed seasons, etc) including priorities for trans-boundary areas of importance.

4. A brief introduction based on the initial review of management areas in the Andaman Sea ASEAN Andaman Countries

Data and information on existing fisheries management schemes and zones of the Andaman Sea Countries are provided and the document prepare for each country generally focused on how management schemes are implementing and how different agencies are taking part in habitat and fisheries management function. Most data and information are mainly taken form internet information and it is the ambition to have some information clarified and information on other management schemes would be needed to make the picture more complete. SEAFDEC will continue to work on this and try to get a more complete reference, with maps, on management areas and their purpose in the Andaman Sea.

INDONESIA

Responsible Agencies

1. Ministry of Forestry

Responsible in biodiversity conservation in land and aquatic area; wildlife sanctuary; to control the over harvesting of the natural resources.

2. Ministry of Marine Affairs and Fisheries

Responsible on the wildlife aquatic (inland and marine fish species) conservation and to control the over harvesting of the aquatic species; to establish sustainable fishing resources; to conserve and to enhance the aquatic species stock.

3. Ministry of the Environment

Zones reserved for traditional/artisanal fisheries (trawling free zones)

Reserved zones are at least 12 miles from the Indonesian shorelines.

Marine Protected Areas (MPA)

Marine protected area is a specific terrestrial where the main function are to protect life support systems, to preserve diversity of plant and animal species as well as to conserve living natural resources and their ecosystems for their sustainable utilization. There are two types of MPA in Indonesia. The first is managed by the government of the Republic Indonesia and the second is managed by local traditional fisheries management.

MPA managed by government of the Republic of Indonesia

No.	National Park	Location	Declaration Area (Ha.)
1	Seribu Island – Kepulauan Seribu	Jakarta	108,000.00
2	Karimun Jawa Islands – Kepulauan Karimun Jawa	Central Java	110,117.30
3	Jawa	North Sulawesi	86,065.00
4	Bunaken Marine Park – T.N. Laut Bunaken	South Sulawesi	530,765.00
5	Taka Bone Rate Marine Park – T.N. Laut Taka Bone Rate	South East Sulawesi	1,390,000.00
6	Wakatobi Islands – Kepulauan Wakatobi Cendrawasih Bay – Teluk Cendrawasih	Papua	1,453,500.00

MPA in Indonesia usually has their own zone, but generally the zones are made up of:

1. Core Zone: Fully restricted area; far from the settlement; minimum accessible; to protect natural living organisms; to protect ecological-physical process; human activities are not allowed.
2. Protection Zone: Protected area; to support the core zone; human activities very limited only for research and training on population-habitat-development.

3. Tourism Zone: Protected area; to support the core zone; human activities only for recreation and tourism is allowed.
4. Local Using Zone: Human activities are allowed only for local inhabitant; traditional fishing for daily food purpose (non commercial fishing).
5. Common Using Zone: Deep sea area development; Human Activities are allowed not only for local inhabitants, but also for commercial companies.

Any infringements in MPA will, according to the law, be punished because the MPA are protected by the law.

Heritage Sites and/or Man and Biosphere areas

I. Marine Strict Nature Resource

No.	Conservation Area	Declaration Area (Ha)	Stated by legal		Lokasi Location
			No	Date	
1	Sangiang Island	700,35	112/Kpts-II/1985	23-05-1985	Serang
2	Leuweung Sancang	1.150,00	92/Kpts-II/90	03-06-1990	Garut
3	Karimata Island	77.000,00	381/Kpts-II/1985	27-12-1985	Ketapang
4	Aru Tenggara	114.000,00	72/Kpts-II/1991	02-04-1991	Maluku Tenggara
5	Riung	2.000,00	589/Kpts-II/1996	16-09-1996	Ngada (NTT)
6	Anak Krakatau	13.735,10	85/Kpts-II/1990	07-11-1990	Lampung Selatan
7	Martelu Purba	195,00	471/Kpts-II/93	09-02-1993	Sumatera Utara

II. Marine Wild Life Sanctuary

No.	Conservation Area	Declaration Area (Ha)	Stated by legal		Lokasi Location
			No	Date	
1	Semama Island	220,00	604/Kpts/Um/8/1982	19-08-1982	Berau
2	Raja Ampat Islands	60.000,00	81/Kpts-II/1993	16-02-1993	Fakfak
3	Sabuda Tataruga	5.000,00	82/Kpts-II/1993	16-02-1993	Fakfak

III. Marine Recreational Park (Heritage sites, man and biosphere)

No.	Conservation Area	Declaration Area (Ha)	Stated by legal		Lokasi Location
			No	Date	
1	Weh island	3.900,00	928/Kpts/Um/12/1982	24-12-1982	Aceh Utara
2	Banyak Islands	227.500,00	596/Kpts-II/1996	16-09-1996	Singkil
3	Sangalaki Island	280,00	604/Kpts/Um/8/1982	19-08-1982	Berau

4	Pombo Island	998,00	392/Kpts-VI/1996	30-07-1996	Maluku Tengah
5	Banda Island	2.500,00	221/Kpts/Um/4/1977	25-04-1977	Maluku Tengah
6	Kassa Island	1.100,00	633/Kpts/Um/10/1978	15-10-1978	Maluku Tengah
7	Moyo Island	6.000,00	308/Kpts-II/1986	04-09-1986	Sumba
8	Gili Meno, G. Ayer, G. Trawangan	2.954,00	85/Kpts-II/1993	16-02-1993	Lombok Barat
9	Maumere Bay	59.450,00	126/Kpts-II/1987	21-04-1987	Sikka
10	Komodo Island	39.000,00	1980	1980	Lesser Sunda Islands
11	Tujuh Belas Island	9.900,00	589//Kpts-II/1996	16-09-1996	Ngada
12	Kupang Island	50.000,00	18/Kpts-II/1993	28-01-1993	Kupang
13	Kapoposang Island	50.000,00	588/Kpts-VI/1996	12-09-1996	Pangkep
14	Padaido Islands	183.000,00	91/Kpts-VI/1997	13-02-1997	Biak
15	Lasolo Island	81.800,00	451/Kpts-II/1999	17-06-1999	Kendari

Indonesia has many heritage sites and man and biosphere areas such as: The Komodo and Rinca Islands, Krakatau Island and etc. The Komodo and Rinca islands are the largest of about 80 islands that lie in between the islands of Sumbawa to the west and Flores in the east. Together with an extensive area of the surrounding ocean they form the Komodo National Park. Established in 1980, the park was declared a Man and Biosphere Reserve and a World Heritage Site in 1986. The park is most famous for its enormous lizards, the Komodo dragon (*Varanus komodensis*), the biggest reptile inhabiting the world today, but unfortunately endangered. Moreover, the Park includes one of the richest marine environments including coral reefs, mangroves, seagrass beds, seamounts, and semi-enclosed bays. These habitats harbor more than 1,000 species of fish, some 260 species of reef-building coral, and 70 species of sponges. Dugong, sharks, manta rays, at least 14 species of whales, dolphins, and sea turtles also make Komodo National Park their home.

Safety zones around shipping lanes and structures in the sea (oil rigs, etc)

Safety zones around shipping lane in Indonesian waters usually established around the straits, for example in Malaka Strait which is, since many years, one of the busiest international shipping lanes. Safety zones also occur in certain area such as Bali Strait, Madura Strait, Sunda Strait, Karimata Straits, Lombok Strait and so on. Safety zones are also established around the oil rigs such as oil rig around Cirebon, Cilacap, Seribu Islands, Batam and so on.

Community fisheries (other than that of traditional management areas)

Ancient local wisdoms in some areas in Indonesia are proven successfully to give protection for the environment, habitat, living organisms and bio-eco-physical process. Coastal and traditional fisheries management based on people's participation could at least solve the problem of enforcing regulations. The cultural factor in traditional regulations facilitates social control. Thus community participation could make management more effective. These ancient local wisdoms are protected by the traditional law (hukum adat) in society by giving moral sanctions and material sanctions. The ancient local wisdom also protected by local government law and national legal. The ancient local wisdoms in Indonesia, they are divided into Marine and Inland local wisdom.

MARINE LOCAL WISDOM

1. Panglima Laut (Banda Aceh)

Panglima Laut is a traditional leader of the coastal fishermen community to mediate between the government and the fishermen to make fisheries development and other programmes succeed. Fishing rules are in force in the seawater areas of every district; based on the custom law for fishermen in that district; controlling the boat, fishing gear, fish size and opening season for some areas; protecting the environment and supporting the government programmes.

Organization: Advisory Committee, Sea Commander (chosen from district sea commander), District Sea Comander, Vice-Sea Commander, Secretary and Treasury.

2. Sasi (Maluku/Molucca)

An ancient community management in Central Maluku whereby a marine area owned by a particular coastal village with traditional use rights is closed from harvest periodically. Sasi is lead by a senior in the society, and he is chosen in a meeting which is held by the representatives from some villages around the area.

3. Awig-awig in Lombok and Bali

Awig-awig, is basically an unwritten law which is the product of the unity of the law of indigenous peoples. Awig-awig is to protect the environment and the natural resource. It is also to regulate and to control how to cultivate, to maintain and to harvest the product. In coastal area, harvesting on fisheries resources such as fishes, scallops, seaweed are very limited and open only at certain season.

Etc.

INLAND FISHERIES LOCAL WISDOM

4. The Lubuk Larangan System in North Sumatra

Fishing is not allowed, if a Lubuk Larangan has not been approved by the leader of the village for the open season; Lubuk Larangan must remain closed for at least six months, so that the fish resource has a chance to rebuild; Any violations of the regulations cited above attracts a jail sentence of six months or a fine.

Organization: it has Chairman, Vice Chairman, Secretary, Treasurer and Controller.

5. **Ikan Diniatkan and Ikan Larangan:** Areas of Traditional Fish Cultivation in the Districts of Pasaman and Padang Pariaman, West Sumatra Province.

Fish cultivation in the Ikan Diniatkan and Ikan Larangan areas is carried out under certain rules such as harvesting time, prohibitions and sanctions; An area is established for Ikan Diniatkan and Ikan Larangan, usually 200 m to 1500 m away upstream and downstream of the rivers from the bench mark; public facility usually used as benchmark is a bridge; Fishing at the Ikan Diniatkan and Ikan Larangan area is conducted once or twice a year; Fishing is usually done using fishing gear that do not endanger fisheries resources sustainability and the environment.

Organization: Patron, Founder, Secretary and Treasury.

6. **An Auction of Lebak Lebung and River:** A Traditional Open Water Auction in the Districts of Ogan Komering Ilir and Musi Banyuasin, South Sumatra Province.

7. **Maawu Dabau Bakuok (MDB):** A Traditional System of Management for Fisheries in Bakouk Lake, Kampar Community, Riau Province.

MALAYSIA

Responsible Agencies

1. Ministry of Agricultural and Agro-based Industry

- Department of Fisheries (DoF) is responsible to fisheries resource management, aquaculture development and fisherman in large scale and traditional.
- Fish Development Authority Malaysia (FDAM) is responsible to fishing port management and fish marketing.

2. Ministry of Natural Resources and Environmental Malaysia

- Department of Marine Park Malaysia is responsible to manage, monitor for 40 MPA's in Malaysia.
- Department of Environment (DOE) is responsible to implement the national environmental policy and enforcement.

Zones reserved for traditional/artisanal fisheries (trawling free zones)

Zone A (0-5 nm) is reserved for traditional fisheries, for Traditional Fisherman & Traditional Anchovy Purse Seiner (Owner Operator).

Marine Protected Areas (MPA)

The responsible agency managing the MPA's in Malaysia is Department of Marine Park Malaysia. Marine Park is a sea zoned area for a distance of two nautical miles from the lowest sea level, except in Kapas Island in Terengganu, Kuraman Island, Rusukan Besar Island and Rusukan Kecil Island in Labuan. These areas are zoned for a distance of 1 nautical mile from the lowest sea level. Marine Park is established to protect and conserve various habitat and aquatic marine life.

Today, the waters around Malaysia's 40 islands are gazetted as Marine Parks. The Marine Park islands are as follows:

No.	Marine Park	Location	Declaration Area (km ²)
1.	Pulau Payar	Kedah	187.73
2.	Pulau Redang	Terengganu	530.29
3.	Pulau Perhentian	Terengganu	
4.	Pulau Kapas	Terengganu	
5.	Pulau Tenggol	Terengganu	
6.	Pulau Tioman	Pahang	676.61
7.	Pulau Tinggi	Johor	765.65

Main Establishments of Marine Park, Malaysia are explained in the Fisheries Act 1985. The Marine Park:

- Afford special protection to aquatic flora and fauna, and protect, preserve and manage the natural breeding grounds and habitat of aquatic life with particular regard to species that are rare or endangered.
- Allow for the natural regeneration of aquatic life where such life has been depleted.
- Promote scientific study and research.
- Preserve and enhance the pristine state and productivity of such areas.
- Regulate recreational and other activities to avoid irreversible damage to its environment.

No Seasonal closures during critical periods

Fishermen are not allowed to fish on every Friday in one week, Hari Raya Celebration, Death of anyone from the fishermen's village, etc.

Biosphere Reserve Information in Malaysia

Not Available

Wildlife Sanctuaries & Parks

1. [Islands off Mersing National Park](#)
2. [Pulau Kukup National Park](#)
3. [Pulau Tiga Park](#)
4. [Tun Sakaran Marine Park](#)
5. [Tunku Abdul Rahman Marine Park](#)
6. [Turtle Islands Park](#)

Safety zones around shipping lanes and structures in the sea (oil rigs, etc)

The littoral states of the Straits have undertaken various initiatives aimed at curbing the menace of piracy and securing the waterway from the threats of terror. They include:

- The formation of the Malaysian Maritime Enforcement Agency, a Coast Guard-type organization providing sea-going maritime constabulary services to assure the safety of vessels transiting Malaysian waters.
- The implementation of MALSINDO, a coordinated patrol scheme involving the navies of Singapore, Malaysia and Indonesia. The trilateral initiative, launched in July 2004, is a joint special task force by the littoral states to safeguard the Straits and provide effective policing along the waterway.
- The 'Eyes in the Sky' (EIS) initiative, a maritime air operation for surveillance over the Straits of Malacca and Singapore. This initiative, involving the three littoral states and Thailand, seeks to detect and deter acts of piracy and transnational criminal activities in the Straits.

- The proposal to set up an Information Sharing Center in Singapore by December 2006 is set out in the Cooperation Agreement on Combating Piracy and armed robbery against Ships in Asia.
- The proposed Long Range Identification and Tracking (LRITS) of ships initiative by Maritime Security Committee of IMO. LRITS will allow ships to identify each other's registration and the type of cargo being carried.
- The increase in the capacity and scope of several security systems already in place involving sea surveillance, vessel traffic and ship reporting.
- The increase in initiatives at the bilateral level, such as Indonesia and Singapore's effort to launch a surveillance radar system in a bid to boost waterways security in the Singapore Straits linking the Straits of Malacca to the South China Sea.
- The increased patrols by Malaysian Marine Police in the Straits which have resulted in several arrests of pirates and armed gang robberies. In 2005, several attacks were foiled by the Malaysian Marine Police, in one case leading to the prosecution of the perpetrators. In addition, several regional initiatives have sought to boost security. These include agreement on information exchange and establishment of communication procedures, treaty of mutual assistance in criminal matters and regional forum framework on measures against terrorism, counter-terrorism and transnational crime. A South East Asian Regional Center for Counter-Terrorism has been set up, while agreements have been reached between ASEAN members and dialogue partners such as the US and EU with reference to cooperation against terrorism in the field of security.

Community fisheries (other than that of traditional management areas)

KEN (Kumpulan Ekonomi Nelayan) or Fishermen Economy Group are responsible to manage and protect their area especially from encroachment by trawlers and those using prohibited gears.

The first attempt to establish a structured CBFM in Malaysia is in Kuala Teriang, Langkawi, Kedah. These initiatives have been co-funded by Department of Fisheries Malaysia/Japanese Trust Fund (SEAFDEC). Indications provided on known local/traditional management systems.

KEN (Fishermen Economy Group) Kuala Teriang and KEN Kuala Chenang have the ownership of FADs and ARs which are responsible to maintain and protect them.

Tagal System in Sabah

Tagal System is a Community-Based Riverine/Inland Fishery Resources Management in Malaysia. This system is gaining the minds and hearts of many riparian communities in Sabah. The Tagal System is a stakeholder-driven system of rehabilitation, protection, and conservation of the river environments and the fisheries resources for its sustainable development. At the moment, the number of Tagal areas established in Sabah has multiplied to 212 involving 107 rivers in eleven districts.

Protection of the environment of the Tagal System river and its enforcement are in the hands of the elected Tagal Committees. At present the enforcement of the prohibitions is through the imposition of native customary laws that are backed by the Native Court.

Other general restrictions on gears, methods, etc

In Malaysia, some of the technical measures currently imposed include area and time restrictions, and gear restrictions such as specifying the minimum mesh sizes of fishing nets. For example, close fishing seasons and areas, and total fishing prohibition within specific stretches of marine waters (e.g. waters of the Marine Park). The minimum cod-end mesh sizes of prawn and fish trawl nets have been set at $\frac{3}{4}$ -inch and $1\frac{1}{2}$ -inch when stretched (Department of Fisheries Malaysia, 1999). The use of turtle excluder devices (TEDs) on prawn trawl nets is increasingly becoming mandatory.

Input controls include restrictions on the number of fishing units through limiting the number of licenses or permits issued, and restrictions on the body and engine sizes of fishing vessels. The maximum engine power (in horsepower) fitted for trawlers should not exceed 4.40 times their GRT, and for purse seiners, engine powers (in horsepower) are only allowed up to 3.47 times their GRT. Vessels employing traditional gears should have engine powers not exceeding 3.40 times their GRT. The amount of time that these units can spend fishing is, however, still not limited.

Limited access is becoming more important as a means to avoid unwarranted conflicts between fishers operating the different fishing gears. In Malaysia, the zone system employed is able to provide ample fishing grounds for the respective gears to fish, and surveillance activities are constantly conducted to ensure the gears do not infringe the terms and conditions stipulated for their operation.

MYANMAR

Responsible Agencies

There are three main agencies concerned with biodiversity conservation and Management. These are as follows;

1. Ministry of Forestry(MOF)

MOF is responsible for habitat maintenance and restoration, protection of endangered and rare species of 100th fauna and flora, establishment of new parks, and naturally protected areas, and buffer zone management.

2. The National Commission for Environmental Affairs (NCEA)

The National Commission for Environmental Affairs (NCEA) is the focal point for all environmental affairs, including management. It is mandated to advise the Cabinet on formulating policy, issue guidelines for implementing policy, guide and advise regulatory agencies on legal matters, and formulate policies and strategies that take into account environmental and developmental priorities.

3. Department of Fisheries(DOF)

DOF is responsible for management and conservation of all aquatic organisms, including aquatic plants, seedlings & seeds.

Zones reserved for traditional/artisanal fisheries (trawling free zones)

Trawl fishing is not allowed to operate within 5nm in northern part and 10 nm in southern part from shore line. Off-shore vessels are not allowed to operate within 5nm in northern part and 10 nm in southern part from shore line.

Marine Protected Areas (MPA)

Lampi Island Marine National Park (112.5 km²) was established in 1996 to preserve the island's vast flora and fauna and coral reefs. Department of Fisheries also declared the area around Done island and Lampi Island within Mergui Archipelago as Shark Fishing prohibited area.

Seasonal closures during critical periods

Some fishing grounds are closed to fishing from June to August for spawning. Some species are not allowed for grow-out period.

- Pomfret(<100 gram)/stow net (April- May)
- Female Mud Crab with eggs (April -May)
- Lobster, Giant mantis shrimp (June-Aug)
- Sea water shrimp (June-Aug)
- Grouper (July-Sept)

- Cuchia eel (Under 3cm in circumferences)

Wildlife sanctuaries/defined habitat reserves

There are two declared wildlife sanctuaries for turtle protection:

- Thamihla Kyun or Diamond Island (88 ha), marine habitat as such is not protected.
- Moscos Islands (4,924 ha), marine habitat as such is not protected.
 - Defined habitat reserves:
 - Wunbaik mangrove forest reserve (22,919 ha)

Safety zones around shipping lanes and structures in the sea (oil rigs, etc)

To prevent Yangon harbor from silting up and forming of sediment and shipping lanes traffic by fishing, Department of Fisheries set up the prohibited areas for net-used fishing within Yangon river, Hlaing river and Bago river. There are also safety zones around oil rigs.

Other general restrictions on gears, methods, etc

- Exclusion of a Fishing Method
 - Dynamites/Explosives
 - Chemicals/Drugs
 - Electricity
 - Pump
- Restricted Gears (e.g. mash size)
 - Trawler - Fish >2.5 inches
- Shrimp >2 inches
 - Gill net - <4.0 inches
 - Stow net - <2.5 inches
 - Purse seine - < 4.0 inches

THAILAND

Responsible Agencies

1. Ministry of Agricultural and cooperatives (MOAC)

Department of Fisheries (DoF) is responsible to fisheries resource and fisherman both in large scale and small scale.

Royal Forestry Department is in general responsible for park management

2. Ministry of Natural Resources and Environment (MNRE)

Department of Marine and Coastal Resources (DMCR) was given the mandate to develop appropriate regulations in order to achieve updated and effective managerial action with the objective of looking after the nation's marine and coastal fragile and vulnerable resources including resources preservation, conservation aimed at sustainable use and rehabilitation.

Pollution Control Department (PCD) is the main agency implementing the national policy on pollution control.

Zones reserved for traditional /artisanal fisheries (Trawling free zones)

The zone reserved for smaller scale fisheries extends 3 km. The small-scale fishery refers to the fishery that operates fishing without boat, with non-powered boat, out-boards powered boat and inboard powered boat of less than 5 GT. The fishing gear used by the small-scale fishery are small-scale bamboo stake trap, traps, gillnets, set bag net, small push net, lift net, hooks and lines and other stationary gears. The small-scale fishers operate their gears in estuaries, bays and inshore waters.

Marine protected areas (MPA)

The establishment of national parks and fish sanctuaries falls under the National Park Act of 1961 and Fisheries Law of 1947. There are five categories of protected areas: national parks, national marine parks, wildlife sanctuaries. Twenty-one National Marine Parks have been declared. Two other MPAs have been designated as non-hunting areas but also encompass coral and mangrove habitats. Of the 21 National Marine Parks, 13 parks include coral reef areas, most of which are located in the Andaman Sea and only five are located in the Gulf of Thailand. Approximately 60% of the coral reef area is included within a protected area. There is no available information on the Fisheries Sanctuaries.

There are 3 large marine and estuarine areas in the Andaman Sea, i.e.,

- 1) Phangnga wetland
- 2) Sirinat National Park wetland
- 3) Taleban National Park wetland

Heritage sites

Among the 16 national parks, three are recognized internationally as globally significant: Mu Ko Similan and Mu Ko Surin form a World Heritage Site and Khao Sam Roi Yot is a RAMSAR site. Tarutao, though rejected as a World Heritage Site, is now an ASEAN Heritage Site and warrants regional priority.

Man and Biosphere areas

The Ranong Biosphere Reserve (RBR) on the Andaman Sea Coast of Southern Thailand Several hundred people directly utilize the natural resources of the Ranong Biosphere Reserve. The mangrove forest ecosystem provides local people with a wide range of species and materials, ranging from mangrove wood products used for fuel wood (firewood and charcoal), fishing gear and housing, to fish, molluscs, crustaceans and other aquatic species which are eaten or sold for income. Many species of mollusc shellfish (mainly oysters, mussels, cockles and clams) are gathered by hand, especially by women and children, while men are engaged mainly in fishing and crab collecting.

Seasonal closures during critical periods

All kind of mechanized trawlers, purse seiner, and encircling nets with have mesh sized smaller than 4.7 cm. are prohibited to operate during spawning period of some aquatic species from 15 April-15 June every year except anchovy purse seine.

Wildlife Sanctuaries

There is no available information on the Fisheries Sanctuaries.

Safety zones around shipping lanes and structures in the sea

No data available for now.

Community fisheries (apart from traditional management areas)

- Bay of Bengal Programme (BOBP) Project Focused on Phang Nga Bay area, the BOBP project assisted in organizing fishing communities.
- FAO Project on Securing Food and Livelihood of Fishers through Gear Replacement in Phangnga Bay, Krabi Province. The project was a gear replacement scheme to exchange destructive push nets with environmentally friendly gillnets.
- The CHARM Project, designed by the MOAC, applies the concept of decentralization and co-management to manage natural resources in the selected coastal sites. The project, approved by the Cabinet on October 9, 2001 has received a grant from the European Union for its implementation.

Indications provides on known local/Traditional management system

- Different kind of fishermen groups such as Mangrove conservation group, Small-scale fishery Association, Saving fishing port and etc. are formed in various local areas.

Other General restrictions

There are prohibitions in the use of destructive fishing gear and destructive fishing practices, i.e., trawls, push nets, short neck clam dredge, dynamite fishing and chemical poisoning.

Additional data: Tran boundary species

It is reported that at least 10 economically important species, including *Rastrelliger brachysoma*, *R. kanagurta*, *Scomberomorus commerson*, *Auxis thazard* *Euthynnus affinis*, *Katsuwonus pelamis*, *Thunnus albacores* and *Loligo spp.*, which are commonly exploited by several countries bordering the Andaman Sea. These species frequent inshore and coastal waters of more than one country or straddle the exclusive economic zones thereof.

The migration pattern of *R. brachysoma* is reported by BOBP (1987). The Indo-Pacific mackerel stock was divided into 3 stocks, i.e. the first stock was distributed in the eastern of Sumatra Island of Indonesia through the south-west of Penang, Malaysia. The second stock distributed between the Myanmar-Thailand boundary waters, and the third distributed in Phangnga Bay through the north of Penang.

**MANAGEMENT AND CONSERVATION SCHEMES IN THE ANDAMAN-
NICOBAR ISLANDS**

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The Andaman-Nicobar Islands are located in 11.68°N and 92.77°E and its total land area is 8,249km² and coast line is 1912 km. There are 572 islands in the territory, of which only approximately 38 islands are permanently inhabited. It is divided into 3 administrative districts in which Nicobar is broadly seemed as tribal area. Nicobar district, home land of six tribes is mainly covered with forests (92%) and of which (86%) are reserved areas. A number of Heritage sites, Sea grass areas, and mangrove and forest areas are established under the Wild life protection Act and Marine fishery regulation (MFR) is enacted for fishery aspect. The wild life areas are not allowed for fishing. The MFR is covered for territorial sea (12Nm) and beyond this area to EEZ is controlled by Ministry of Agriculture of Central government. The MFR is covered for the regulations of zoning system, closed seasons measures, mesh size limitation and fishing gear restriction and additional to the regulation, shore line to 5 Nm is set for tribal area of daily live fishing. Nearly 3000 fishing vessels are operating within territorial area and fishing exploitation (28,855 tons in 2007-08) is very low compare with fishing potential (148000 Tons).

**INTEGRATION OF FISH AND HABITAT MANAGEMENT FISHERIES
RESOURCES CONSERVATION AREAS (REFUGIA) : IN CASE OF
*RASTRELLIGER SPP.***

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In 2007, the production of *Rastrelliger spp.* was 70,829 mts or 8% of total marine captures from purse seine gillnet and other gears along the Andaman Sea. There are 3 species of genus *Rastrelliger* or “plato” found in Thai waters i.e. *R. brachysoma*, *R. kanagurta* and *R. faughni*. Distribution of *Rastrelliger spp.* found along coast in Thai-Malaysian boundary waters from Andaman of Thailand down to Malaysia and Sumatra Island. *Rastrelliger* were mainly caught by commercial such as fishing gear purse seine, pair trawl and artisanal gear such as gill net, etc. From year 1996-2006 Catch of *R. brachysoma* varied from 30,780-49,548 mts, while *R. kanagurta* varied from 13,301-27,848 mts. Value of *R. brachysoma* varied from 767-1,435 million baht, while *R. kanagurta* varied from 292-704 million baht.

Biology of *R. brachysoma* found no different in total length and body weight of male and female. Short mackerel spawned throughout the year. However, in year 2004 the spawning peak could be observed in May, but it was not clearly observed in year 2005. Condition factor had varied by month and by years, So that spawning season also different change. Sex ratio of male to female was 1:0.82. The female length at first maturity was 15.82 cm.

The Ministry of Agriculture and Co-operatives announced the amendment of fishing gear which shall not be used in harvesting during spawning, breeding and nursing season off under proclamation areas of Phuket, Phang-nga, Krabi and Trang Provinces during stipulated period, 1st March to 30th June in yearly, since October 24th 2008. The conservation zone covered 4,386 km², whereas the prohibited gears were trawls, purse seines, gillnet with mesh size <4.7 cm, except anchovy purse seine operated in daytime, bream trawl with engine operated in night-time, bamboo stake trap. Not only mackerel but Thai waters have another economic species such as cuttlefish, anchovy, threadfin bream, which have life cycle in Andaman coast area.

STATUS OF HILSA FISHERIES IN MYANMAR

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ABSTRACT

Hilsa fisheries of the Myanmar existed in long-time ago. About 1966 there was a book called the "knowledge of the fisheries" in which the Hilsa fisheries was described in Myanmar language. In old days, the Myanmar fishermen used the net that called Hilsa net to catch Hilsa. ("Nga Thalauk" in Myanmar language of Hilsa fish, still used the present day). It described the measurement of the fishing net of which the mesh size was 4.5 inches, net length 57.91 ft, net depth 46.33 ft. 12 wooden boats with 24 fishermen were operated for encompassing the Hilsa fish school. The size of the small boat is length over all 23.16 ft, width 28.96 ft, depth 1.66 ft. The fishermen combine the net 4 to 5 set of net as one unit. The old fishing technique of Hilsa fisheries needed many crews to catch the Hilsa fish schools. Firstly, when they arrived the fishing ground, the master fisherman has to observe the symbol of fish school at the sea surface. When master fisherman saw the symbol of school, they surround the fish school by small boats. After they encircled the school of Hilsa, they made loud noise to the fish school dense by hitting the water. The fish were tangled with nets, then they hauled up. The fishing season was from September to May about 9 months. Mostly the fishermen operated day time at the slow water current. The peak season of the Hilsa fisheries was January to April. They caught mostly Hilsa and also caught Arius sp, sharks, and pomfrets as by-catch. The Hilsa is the well-known fish in Myanmar. It is closed allied to the famous American shad. The body is rather deep. The upper edge of the dorsal fin is concave. The caudal fin is deeply forked and is partly covered with scales. The colour of the fish is silvery shot with gold and purple. The immature specimens have dark bar across the back and upper portion of the sides. Hilsa is an anadromous fish, living in the sea or estuaries and swarm up the rivers to spawn during the monsoons. It is excellent taste after cooked. Now the total catch of Hilsa specie is lower and lower. It is the time to conserve through responsible fisheries management.

Key word: Hilsa fisheries

Introduction

Myanmar with a coastline nearly 3000 kilometre, several huge estuaries, delta system and numerous offshore islands, Myanmar possesses a considerable of coastal habitats, including enormous coral reefs, mangroves, sandy beaches and mudflats. The north central part of the country is dominated by the vest delta of the Ayeyarwaddy River, one of the biggest river in Southeast Asia. Several major rivers including Ganges in the North and Ayeyarwaddy, Sittaung and Thanlwin (Salween) in the Gulf of Martaban have created soft shore where mangroves develop extensively. Myanmar has a long coastline and adding to this the coastline of over 800 islands Myeik archipelagos in Taninthayi Division alone there is a extensive coastal zone for colonization by mangroves. The main value of these mangrove system and tributaries of the rivers are particularly their contribution to fisheries sector the best habitats for marine creatures.

Fisheries sector is the fourth contributor to the GDP of the Myanmar's sectoral composition of the Gross Domestic Product in 2007-2008. Per capita food fish supply is 44 kg in 2006-07.

Review of Status of Hilsa fisheries in Myanmar

Hilsa fisheries is very old livelihood for Myanmar local people who live in the coastal region. Hilsa (Nga Thalauk) curry is a popular dish for local people who like very much. Among the fishes, Hilsa has the good taste and smell when they have cooked. We exported Hilsa to at least 34 countries and still high demand to export. In 2004-05, the Myanmar Fisheries Companies exported Hilsa shad (*Tenualosa ilisha*) only 13368.2 Metric Tons to 25 countries and in 2005-06 Myanmar exported 15835.9 Metric tons of Hilsa only. It contributed 9.4% to the total exported fishes of Myanmar.

Department of fisheries issued the fishing license to perform the fishing activities at the desire fishing grounds. From 1992-1993 to 1996-1997, the fishing boats become lesser and lesser to 59 vessels, because the fishing boat could not catch enough Hilsa resources, in 97-98 the amount of registered fishing boats are gradually increased again.

Type of Fishing Gears and vessels

No	Years	Trawl	Purse seine	Drift net	Long line	Stick held falling net	Traps	total
1	1997-98	882	78	745	2	-	2	1709
2	98-99	1025	65	861	3	23	7	1984
3	99-2000	899	83	990	25	7	28	2032
4	2000-2001	967	77	778	114	5	46	1987
5	01-02	939	86	820	103	6	47	1999
6	02-03	984	76	1126	58	7	58	2309
7	03-04	839	78	1115	47	8	34	2121
8	04-05	884	89	1068	60	9	40	2150
9	05-06	851	118	778	41	28	42	1858
10	2006-07	712	122	829	2	23	161	1849
11	2007-08	770	152	522	248	1	151	1844

Data source: Statistical year book

Table 1. Fishing boats and vessels in Myanmar water

year	small fishing boat		offshore vessel		Total
	Power boat	Non-power boat	National	Foreign	
1997-1998	1211	9660	1709	426	24006
1998-1999	14245	10720	1984	1066	28015
1999-2000	12043	11191	2031	639	25905
2000-2001	12846	13253	1987	36	28122
2001-2002	13591	14649	1999	150	30389
2002-2003	15607	14813	2309	9	32738
2003-2004	13664	16335	2121	61	32181
2004-2005	14176	16687	2150	423	33436
2005-2006	14097	16352	1858	254	32561
2006-2007	14284	16284	1872	206	32645
2007-2008	14289	15219	1839	248	31595
2008-2009	13923	28591	1871	261	44646

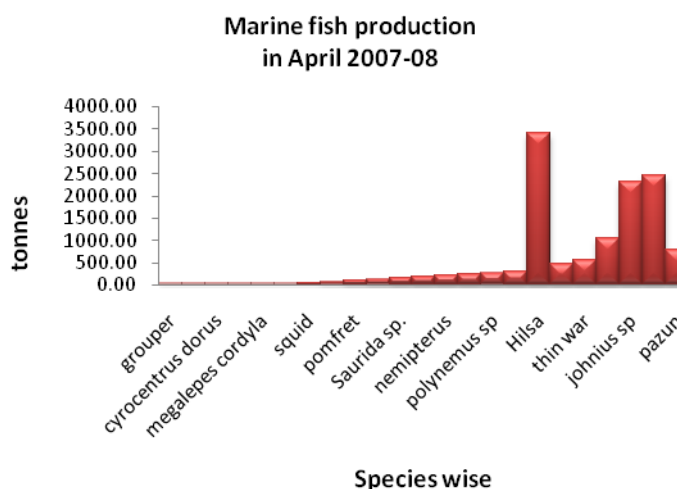
Geographical distribution

Hilsa inhabits in a wide range of environment such as the marine, the estuarine and the riverine. The riverine habitat covers the Saudi Arabia, and Tigris and Euphrates of Iran and Iraq, the Indus of Pakistan, the rivers of eastern and western India, the Ayeyarwaddy of Myanmar and the Padma, the Jamuna and Meghna and other coastal rivers of Bangladesh. The Hilsa fish species can catch many places and especially at the delta region.

Bangladesh alone has got 75% of the Hilsa resource followed by India, about 10% and the Myanmar and other countries have the rest 5% only. It is extremely migratory species in nature. In Myanmar, Hilsa resources can be found at the river mouths of the delta region, estuarine and marine coastal waters. And also can catch at the Sittaung river mouth and lower reaches of this rivers.

Catch statistics

There are 11 landing ports in Yangon, Myanmar. The Hilsa purse seine boats can unloaded any jetty or landing ports which are Alone port, Htay Myanmar port, Anawar Lhwan Co.ltd, and Hyi Lon port and so on. Among the catch, the dominant catch is Hilsa species in their season. The Figure (right) shows Marine Fish production in April 2007-08).



Total Hilsa production (tons)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
2006-07	5345.2	3722.9	2827.5									2392.39	2631.54
2007-08				3408.78	1.1	0.87	0.86	0.84	0.97	1.08	1.34	3447.14	6947.12

Source: one stop service (DOF)

Hilsa landed at the landing sites of Yangon

Date	Catch (tons)	Current prices (Myanmar Kyat) /1.633 kilogram
April 2007	135.23	32000
May 2007	116.33	35000
June 2007	25.21	40000
July 2007	15.74	38000
August 2007	24.84	40000
September 2007	45.75	30000
October 2007	80.96	17000
November 2007	131.02	11000
December 2007	224.94	12700
January 2008	87.59	12800
February 2008	186.49	12500

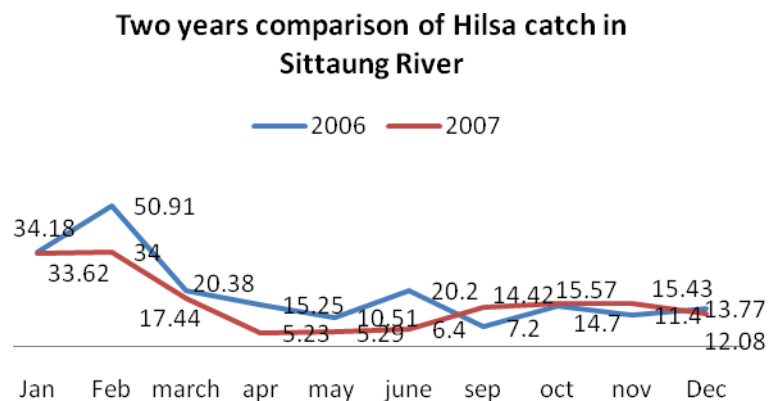
Data source: Ngwe-Pin-Lae, fisheries journal

According to the data source of the one stop service of DoF, Yangon division, in 2009-2010, the percentage of fish species, are incase of Indian pike conger is 1 to 4%, snapper and groupers are less than 1%, four finger threadfin is less than 1% in April and 2% in May. Marine shrimp catch is 11% in May and June. Pomfret is till 1%, loligo is 4 to 7 %, hilsa catch is 18% in April but 2.18% in May. The catch % of the shrimp is increased in May to June.

The fish, Hilsa is a diadromous species which is very important food fish source for the Myanmar people. Now a day Hilsa is a one of the good demand for foreign exchange earning resources for Myanmar. In Myanmar Hilsa is reported to occur in the Naf, Ayeyarwaddy and Sittaung rivers and their estuaries (Kyaw 1953, Raja 1985). The Indian shad, *Tenualosa (Hilsa) ilisha* belongs to the sub-family Alosinae of family Clupeidae and is largely an anadromous species. The systematic name of the species has been revised recently to *Tenualosa ilisha* (Fischer and Bianchi 1984) but the popular name *Hilsa* has been used for more than a century. There are five species of *Tenualosa*: *Tenualosa ilisha* (the Hilsa of Bangladesh) extending from Burma to the Arabian Gulf is the most wide spread and best studied (G.C. Haldar and M. Anisur Rahman, 1998).

Important biological attribute of the landing.

Hilsa is obtained and landed throughout the year. The fishing peak season of Hilsa is from 1st December to 31st May. The Hilsa production in 2007-08 is 13810.10 Metric tons according to the data source of the one stop service of DOF. And the local fishermen also get the good catch in the river using the trammel gill nets. The January to April is a peak season for Hilsa fishing in the Sittaung River.



Spawning season

Fishermen observed the spawning season of the Hilsa is in the month of May of the year. The fishermen found the Hilsa with ripened roes at the river mouths in the month of June. But there is no systematic study to identify the spawning ground of the Hilsa. But the expertise of the master fishermen can observed the occurrence of the ripe and running male and female during the month of above mentioned.

Review of natural and anthropogenic impact on Hilsa fisheries

Hilsa is a much-loved curry for local Myanmar people not only meat but also her roe. In spawning season of Hilsa, fishermen can obtained more income because of her roe even the DOF given knowledge through short TV programs, pamphlets, flyers etc, avoiding to catch the breeder fishes and juveniles. In the local market, anybody can find out the Hilsa roe sellers. Now, the fishermen paid attention on the Hilsa fisheries management because it is a good demand exported fish with lucrative business.

Siltation

Ayeyarwaddy River enters the Andaman sea by nine principal mouths together with Sittaung and Thanlwin rivers. The delta zone lies at the centre of the coastal zone with an area of 35,138 sq.km. Apart from the western part of the zone which is adjacent to the Rakhine Yoma the region is flat alluvial plain with a new network of tributaries of Ayeyarwaddy river.

These rivers together with the Sittaung and Thanlwin deposited enormous discharge of the Ayeyarwaddy river has been estimated at 250 million tons. The delta is building seaward at the rate of 5 km every hundred years, and the seaward advance of Gulf of Mottama at its 40 m depth contour is estimated at 35 km every hundred years. Siltation is also serious threat. Major rivers are continuously changing the river hydrology, bottom topography and are creating many merged and submerged islands this process is degrading the Hilsa habitats, changing the ecology and will substantially affect Hilsa production later.

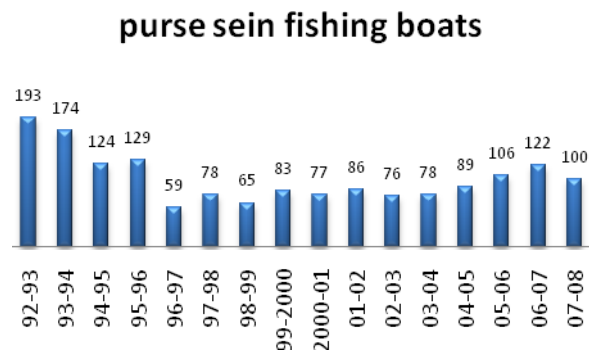
Gold panning and mining

Gold panning is widespread in the valley of the Ayeyarwaddy. Whilst mechanised gold panning contributes to erosion of the banks and turbidity in the main river, the major

concern is the use of Mercury in the recovery process. Mercury is extremely toxic heavy metal that bio accumulates in food chains. Next to nothing is known about the use of Mercury and its effect on the flora and fauna in Myanmar.

Review of the data on the Socio-economic aspects, number of fishers and their geographical spread, number of gears and crafts, fishing periodicity both space and time.

Department of Fisheries is key player in fisheries information system, by issuing the license of the fishing activities. According to the registered book, the number of fishing boats declined very quickly in 1992-93 to 1996-97 because of the lesser catch of Hilsa. After 1996-97, the Hilsa resources are become stable and the fishermen can catch more again. But the condition of the Hilsa catch becomes less year by year.



The most important gear used to catch Hilsa is Purse seine net, mostly the purse seine boats are Yangon based and the most preferred fishing ground is Ayeyarwaddy in which they can catch from December to till January and they could get good catch. Most of the purseiners are wooden vessels. About 53 to 58 crews were working on boats at the time of fishing operation.

Most of the fishermen agreed to take measure for sustainable Hilsa resources utilization management. And they also clearly understand that they have to make escapement for the juvenile of the Hilsa as conservation measure.

Socio-economic of Hilsa fishing community

In Myanmar generally, there are two categories of fishermen in small-scale fishing, they are fishing boat owner and crews. Most of fishing boats owner in marine fishing do not go to the sea. They are non-sea going fishermen. But in inland open water capture fisheries, many of the fishing boats owners are involved in fishing also. However, both in inland and marine fishing boats owners, in most of the cases, will provide mechanised boat, fishing gears, and other necessary fishing materials and food for crews work as actual fishermen and undertake different responsibilities in fishing.

The income sharing arrangement among boat owner and crews depend on the type of gear used and period in fishing season. After covering the operational costs, the master fishermen will get the some percentage of the total value of the catch and plus his agreed payment such as three time of his agreed amount. From 40% of the income The fishermen can get as a pay about 100,000 to 200,000 kyats per trip. The skipper can get the two times of the salary of the crews.

Important management aspects undertaken by Government of Myanmar for sustainable development of Hilsa fisheries

- Existing legal and policy support to the management efforts

Legal frameworks

"The Fisheries Manual 1905" was firstly formulated by Colonel Maxwell, from British Government. It was only legislation regulating for fishery management the fishing

industry of Myanmar in early 1900s. After the fisheries manual of 1905 came into force, this fisheries law was amended in 1954, and was finally repealed with Fresh water fisheries law in 1991. After that the government promulgated other three fisheries laws which are "Aquaculture fisheries law" in 1989, "Myanmar marine fisheries law" in 1990, and "Freshwater fisheries law" in 1991. And "Law relating to the fishing rights of foreign fishing vessels" in 1989.

However, in the 1980s, the introduction of trawling in coastal waters created much conflict between traditional fishermen and trawlers. This led to the amending of the fisheries law of 1989, which provided a more comprehensive legal framework to manage the fisheries in Myanmar's water. This law was formulated to integrate and strengthen the legal framework relating to marine and inland fisheries;

- to get more revenues of fishery taxation;
- to protect the natural living fisheries resources;
- to ensure equitable allocation of fisheries resources;
- to get the accuracy fishery data; and
- to strengthen systematically administrative activities to reduce conflict among the fishing communities.

Closed fishing area

Commercial fishing vessels, like trawlers, purse seiner, and long-liner are prohibited from fishing at less than five nautical miles from the shore. The area within five nautical miles of the nursery grounds for juveniles of fish and shrimp. This will reduce the fishing pressure from trawlers and purse seiners. Department of Fisheries took the action on restricted nursery areas are:

- One fishing ground (A20) in Rakhine state.
- Five fishing grounds (B15, B20, B10, C3, C4) in Ayeyarwaddy division
- Two fishing grounds (D23, D28) in Mon state
- Two fishing grounds (E11, E17) in Taninthayi division

These closed area lasted from June to August (three months) annually.

National Policy on Fisheries Sector

The Ministry of fisheries has a policy for the all round development of fisheries sector as follows:-

1. to promote all-round development in the fisheries sector
2. to increase the fish production for domestic consumption and share the surplus with neighboring countries
3. to encourage the expansion of marine and freshwater aquaculture
4. to upgrade the socio-economic status of the fishery communities

GOVERNMENT'S POLICY AND OBJECTIVES OF THE FISHERY SECTOR

Main policy and objectives of the Ministry of Livestock and Fisheries are:

1. To promote good quality fish seeds distribution;
2. To promote all round development in Livestock and Fisheries and Fisheries Sector;
3. To increase fish production for domestic consumption and share the surplus with neighboring countries;
4. To uplift the all round development of Livestock and Fisheries and Fisheries related investment;

5. To expand the development of shrimp culture;
6. To conserve the sustainable fisheries resources
7. To increase freshwater cultured fish production for domestic consumption, and to speed up the enhancement of the fisheries resources in Myanmar fisheries waters.
8. To upgrade the socio-economic status of fishery communities with the guidance of the National

The Responsibilities of Department of Fisheries for Development and Management

1. Conservation and rehabilitation of Fishery resources;
2. Promotion of fisheries research and surveys;
3. Collection and compilation of fishery statistics and information;
4. Extension services;
5. Supervision of fishery sector;
6. Sustainability of fisheries resources.

And Ministry of livestock and fisheries has laid down the fishery development plan for 2006-07 to 2007-08. They are:-

National Fisheries Development Plan

1. Planning for supporting to expansion of coastal aquaculture;
2. The department of Fisheries initiated environment-friendly schemes in intensive shrimp farming, and is encouraging the private farmers;
3. Provide financial assistance and loans through "Livestock and Fisheries Deelopment Bank".
4. Expansion of rice-fish culture program for development of rural area.
5. Three years' shrimp culture development plan (2nd phase).
6. Planning for public awareness for conservation of fishery resources.

Natural Resources Management Policies

1. Set up strategy to increase fish production by stocking fish and prawn seeds into dams, reservoirs, and natural water bodies;
2. Lease holders have to hold fish seeds in pens, to release at the beginning of next season. In this way, there is significant increase in fish production by such culture based capture system in Myanmar.
3. Promoting education programs related to conservation and rehabilitation of fisheries resources.

Related Marine Research

1. Data collecting on some marine aquatic animal (shark, turtle, mammals) and now implementing the preliminary data collection for fishery indicator collaboration with SEAFDEC/TD.
2. Marine fisheries resources survey with the assistant of SEAFDEC, BIMSTEC
3. Ayeyarwaddy Dolphin survey supported by WCS
4. Mariculture practices.

Other planning

1. Capacity building on improving fishery statistics system in collaboration with SEAFDEC.

2. Implementation of HACCP system in fishery products industries;
3. Sustainable fisheries and Mariculture for rural livelihood development programme in collaboration with JICA;
4. Training and demonstration on various aquaculture techniques;
5. Planning for fisheries sectors development;
6. Strengthening of fisheries laws enforcement.
7. Biodiversity conservation with the assistance of Biodiversity and Natural Conservation with the assistance of Biodiversity and Natural Conservation Association (BANCA).

Environmental legislation in Myanmar

The hierarchy of legislation in Myanmar is as follows:-

- the Constitution;
- Laws issued by the State Peace and Development Council (SPDC) (exercising legislation function);
- Decrees or subsidiary legislation issued by Ministers.

The environmental management effort in Myanmar is still largely sectoral in nature. However, in 1977, the Myanmar Agenda 21 was presented at the United Nation General Assembly. This policy document provides an integrated framework of programmes and actions aimed at securing the aims of sustainable development.

Involvement of community in the management programmes

Requirement of comprehensive management plan

The practices for involvement of community management plan should be established collaboration with NGOs and with the help of some private sector, such as fishermen association for entrepreneurs of fish culture groups, shrimp culture group, and so on for future fishery management. There is Myanmar Fisheries Federation (MFF) is under the umbrella of Ministry of Livestock and Fisheries. In order to better manage the fishery sector, DoF and MFF has teamed up to work together to achieve the common goals as stated in regional slogan: - "Fish for the people". MFF is one of the highest NGO commercial organization to encourage and promote fisheries industries of Myanmar as well as to support the fishermen and fish farmers. MFF performed many supporting roles: such as to support application to undertake fisheries and aquaculture activities. It can recommend application for bank loan for activities for fisheries related fields. MFF supports for membership's benefits. And it can help negotiation for fishery related trading.

Need Regional cooperation

In Myanmar, there are any specific research activities of Hilsa fisheries need to do. In order to develop a better understanding of Hilsa's life history for the purpose of sound management for Hilsa fisheries

- Need technical assists from Regional organization such as SIDA, BOBLME program collaboration with other experienced countries.
- Biology and stock assessment studies of *Tenualosa ilisha* species available in Myanmar.
- Need experiment fishing and tagging or any means to find out the migratory route of Hilsa collaboration with SIDA, BOBLME.

- Need the result and information dissemination among the SEAFDEC/BIMSTEC member countries.

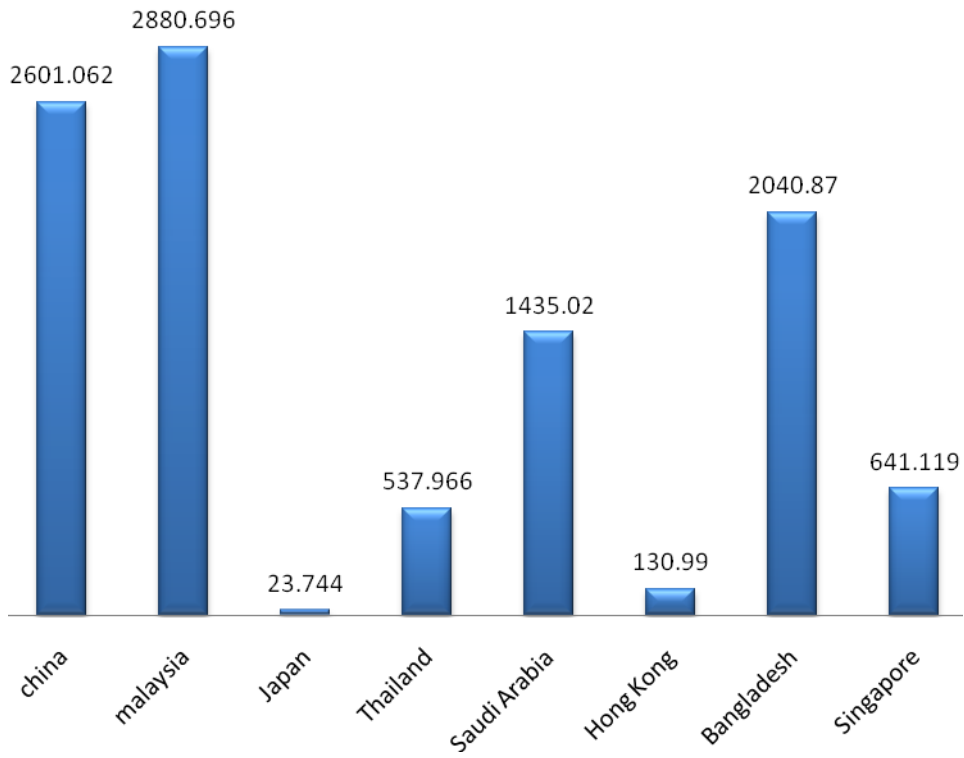
The salient recommendations and suggestions

- More attention is to be paid for detection and conservation for hilsa fisheries resource assessment and monitoring system should be established.
- Protect catch of juvenile Hilsa
- Mesh size regulation, banning of brood hilsa during breeding period and control of indiscriminate catching juvenile should be made.
- Create people's awareness through publicity in any means, providing HRD in-country training.
- A joint task force should be established including from relevant institutions.

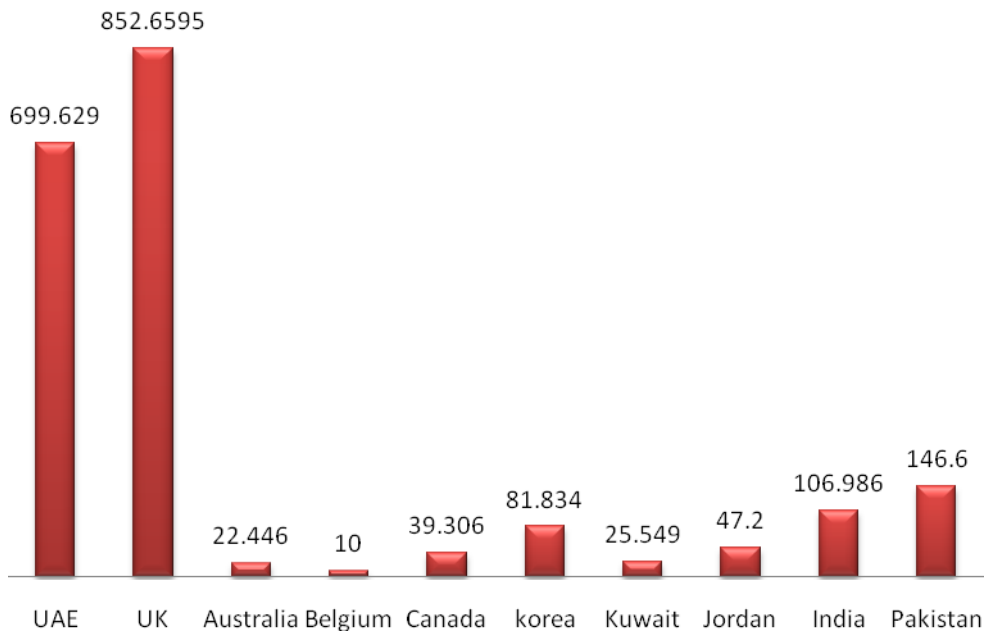
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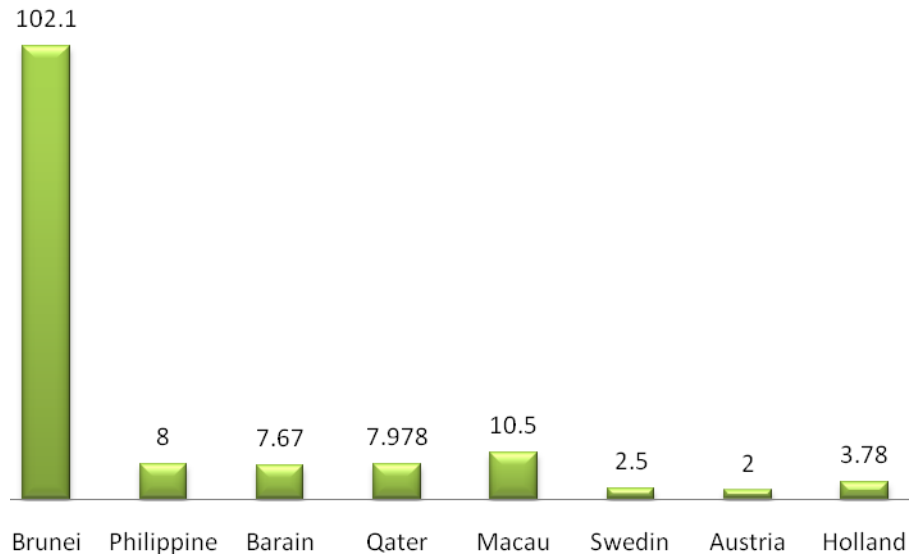
Exported Hilsa, 2004-05
(country wise) tonnes



Exported Hilsa, 2004-05
(country wise) tonnes



**Exported Hilsa, 2004-05
(country wise)**



**Country wise Exported Hilsa
in 2004-05**

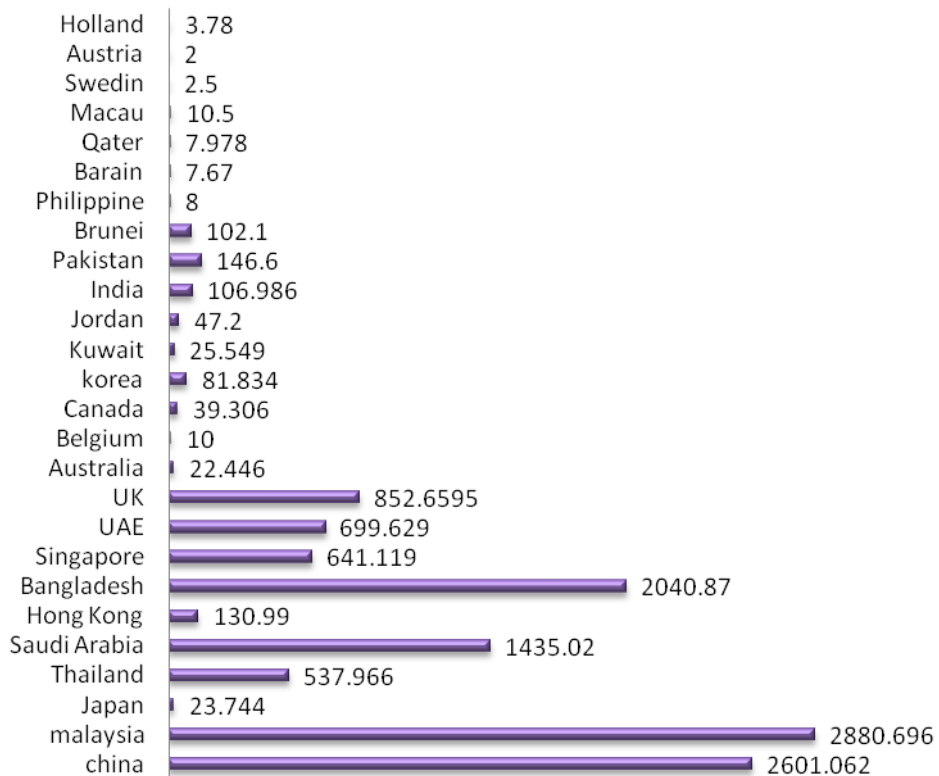


Fig.1,2,3,4. Countrywise exported Hilsa

MCS NETWORK, VESSEL RECORD AND INVENTORY

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INTRODUCTION

Fisheries development has been growing very fast in Asian region leading to huge amounts capture fisheries landings allowing the countries to become dominating exporters at world markets. As a result of the growth, overexploitation, conflicts among resources users, depletion of fishery resources has become major problems to deal with. Moreover, there is competition within the fishing industry including technical development to find increasingly efficient ways to fish more than ever in the region, combined with a lack of appropriate management plan and/or ignorance by fishermen of existing regulations and control mechanisms. This lead to a continued increase in fishing effort with overall intensification of the fisheries leading to resources degradation; destruction of ecosystems and habitats and; diminishing economic returns.

In addition to fisheries related problems (which can be classified into economic, social, institutional and biological problems) the fisheries resources are by all countries in the region regarded as open-access resources. Consequently, it is necessary to use a broad variety of management tools to cope with this problem. There are several management measures and tools that could be used. As an initial measure the sub-Regional meeting on the Gulf of Thailand, Bangkok, 24-26 February 2009 proposed that increased efforts should be made with respect to “Monitor, Control and Surveillance”, “vessel records and inventory” and “Port monitoring” to assess and record the status of fisheries in the countries. Furthermore, the meeting suggested that effective management would depend on increased cooperation among nations in the sub-region.

I. Monitor, Control and Surveillance and MCS Network

There are several definitions and interpretations of elements to be addressed through monitoring, control and surveillance. However, this paper refers to the definition from the workshop on monitoring, control and surveillance organized through the RPOA (“RPOA to promote responsible fishing practice including combating IUU fishing in the region”), Bali, 4-6 March 2006, as context below;

Monitoring (M) – the collection, measurement and analysis of fishing and related activities including – but not limited to – catch, species composition, fishing effort, by-catch, discard, areas of operations etc; in which this information is primary data to use for decision making.

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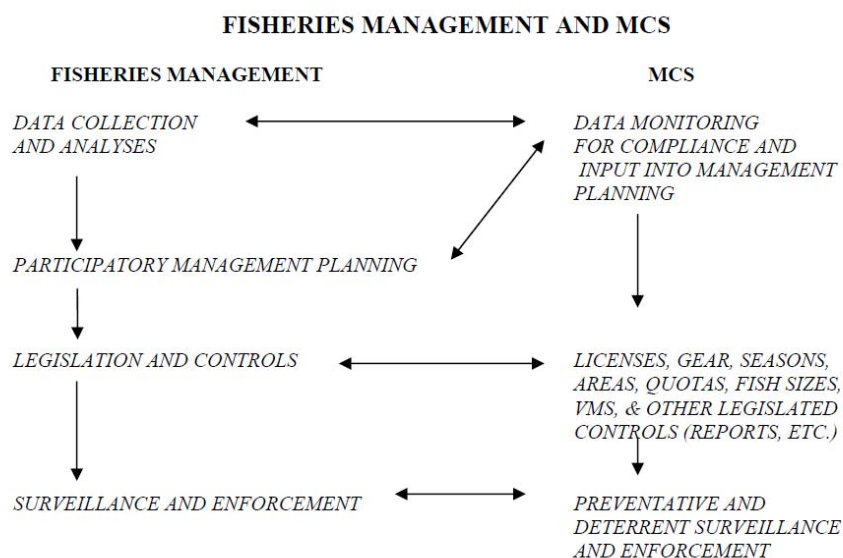
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Control (C) – the establishment of measure consisting of the specification of terms and conditions under which resources can be harvested. It involves the specific of the terms and condition under which resources can be harvested. These specifications are normally contained in national fisheries (and other) legislation and other arrangements that might be nationally, sub-regionally, or regionally agreed. The legislation provides the basis for which fisheries arrangements, via MCS, are implemented.

Surveillance (S) – the checking and supervision of fishing and related activities to ensure that national legislation and terms, conditions of access, and management measures are observed.



(Source: Flewwelling, 2006)

MCS network

The first Sub-Regional Meeting on the Gulf of Thailand, held in Bangkok, Thailand, 28-29 March 2008, recommended to give priority to the initiative to establish of MCS network in the Gulf of Thailand. The meeting recognized the importance of the development of an MCS network in order to strengthen the MCS function and sustainable fisheries management in sub-region. It was emphasized that the ambitious to set up a regional MCS network should be done with an aim to allow an “Asian Model” to emerge based on the requirements of the region. Based on the recommendations, the Gulf of Thailand countries agreed initiate the process to set up the MCS network for the sub-region. The initially stage for establishment should start with sharing of information and institutional cooperation. Areas for information sharing and cooperation should include:

- Vessel record and inventory
- Port monitoring mechanism and information on landing
- Information and monitoring of:
 - Gears and licenses
 - Catches/ catch documentation

- Special attention need to be made on ways to include information from community fisheries and community based fisheries management

To indicate key institutions involved in M, C and S activities – and to be approached for the MCS network – a draft Institution Matrix of Key Element of “Monitoring”, “Control” and “Surveillance” should be further developed. To promote institution cooperation in the Andaman Sea the matrix introduced to the Gulf of Thailand group could be used as a starting point. Comments and recommendation from the earlier meetings on the establishment of an MCS network will be provided. Information sharing was one the basic starting points and the sharing of information on numbers of boats, people, etc involved in fishing has in a number of meetings been agreed upon among ASEAN Member Countries.

The rationale for the establishment of a MCS network are to assist countries (governments, private sector/industry and fishermen) around the Andaman Sea to cooperate in preparing themselves for increasing demand and legal measures and regulations such as catch documentation, traceability, combating IUU fisheries, etc and other requirements to achieve and maintain sustainable fisheries

However, there are problems involved in setting up a MCS network because of 1) various national systems among countries of the region and different legal systems resulting in difficulties to harmonize policies and legislation on fisheries among countries 2) various level of fisheries research capacities as well as data collection systems among countries of the region. The setting up of the MCS network should be initiated with institutional cooperation together with information sharing, knowledge exchange and technology transfer. This meeting is well placed to indicate ambitions to improve the dialogue, not only between countries, but also between key institutions involved with the purpose to provide a platform for countries around the Andaman Sea (Myanmar, Thailand, Malaysia, Indonesia and India) to review problems and suggest solutions in order to develop the “MCS Networks”.

The meeting is requested to provide recommendations on the following points:

1. To indicate steps needed to take and level of ambitions for development of a sub-regional MCS Network, the Meeting is requested to identify the suitable requirements of the region.
2. To initiate a process to identify key institutions involved in the M, C and S respectively with legal document specifying the institutional mandate.

II. Vessel Record and Inventory-as regional cooperation

“Fishing vessel registration” and/or a complete record of active vessels are central to the Management of the Capacity. However, when it comes to regional coordination it should be noted that there are different systems of vessel registration and vessel records among countries in the region, involving a range of institution depending on purpose, scale and locality. Fishing operation and fleet structures are different from country to country in the region and there is a need to gradually agree on a set of criteria to be able to create a regional register, e.g. categories of sizes of the boat, energy consumption, etc. Another well recognized difficulty in coordinating registration and licensing is that these tasks are often performed by different institutions, belonging to different ministries. It is important to continue to highlight the distinctions between “vessel registration – fishing vessel

registration – fishing licenses” while stating the fact that large numbers of fishing boats are not registered. Key to any attempt to manage the effective fishing capacity is an urgent need, in each of the countries and the region as a whole, to get a clear picture of the size and structure of the sector – both large scale and small scale – in terms of numbers and size of vessels together with the number of people that is actually involved. To move in that direction there is a need to work out a region-wide inventory, with inputs from each of the countries, of available fishing capacity in the large and small scale segments of the sector. There is a need for a regional “vessel record and inventory”. In addition, special reference is needed to small-scale fisheries that are not subject to any systematic registration. Ideally, functions of vessel registration and licensing for fishing should be done within the same institution. However, there are some legal limitations in how far countries can move in this direction. For small-scale fisheries involvement of local level institutions and community fisheries units need to be explored.

Data on vessel registration should be recent and accurate for purpose of fisheries management. In support of Fisheries management, fisheries agencies should be the one that should have the duty and mandate to collect and process information on fishing vessel and gears. Sharing information among ASEAN countries could be a way to start and make common information easily available. Need to agree on what criteria and how to measure these elements: length, gross tonnage, Hp, etc. to be able to create a regional register/list.

III. Port monitoring

During the first and second Sub-Regional Meeting on the Gulf of Thailand proposals were made to establish a good cooperation mechanism for the port monitoring among the countries around the Gulf of Thailand. This mechanism should also, specifically, address and monitor the landing of “non-national vessel” and landing across boundaries. Among the Gulf of Thailand group, all countries agreed to try to indicate information on landing by “neighboring GOT countries vessels” and for this purpose the data that should be collected and documented at the ports need to be organized accordingly.

Monitoring involves the collection, measurement, and analysis of fishing activity including, but not limited to i.e. catch, species, composition, fishing effort, by-catch, discards, area of operations etc. Hence, the continuous measurement of fishing effort and resource yields should enable the fisheries manager to make informed and effective decisions regarding the management of resources. One effective method of this data may be collected is through the undertaking of port monitoring activities. Port monitoring activities will allow for data to be collected in order to assist in the compilation of information on or overview of fishing, including vessels, catch, current fish stocks, trade flows and markets, etc. Furthermore, the development of port monitoring should prepare the countries for increasing demand on traceability, catch documentation and in the event that the FAO Legally binding Instrument on Port State Measures for Combating Illegal, Unreported and Unregulated (IUU) Fishing.

Based on increasing requirements on traceability, and the importance to monitor landings across boundaries, the meeting are requested provide recommendations on port monitoring within the framework of Andaman Sea cooperation including following aspects:

- 1) Ways of cooperating on developing effective port monitoring for: landings from fishing vessels AND carrier vessels

- 2) Port monitoring needs and inspection capacity/skills needed
- 3) Capacity building at local, national and sub-regional level including agency coordination

IV. IUU fishing – definition applicable to the Andaman Sea

The second Sub-Regional Meeting on the Gulf of Thailand (February 2009 Bangkok, Thailand) agreed on the definition of IUU fishing relevant to the context of The Gulf of Thailand to be used as a reference for work of GOT group. The Gulf of Thailand definition states that IUU fisheries are fishing that is:

- Conducted by national or foreign fishing vessels in waters under the jurisdiction of a state, without the permission of that state, or in contravention of its laws and regulations
- In violation of national laws or [relevant international obligation]
- Which have not been reported, or have been misreported, to the relevant national authority, in contravention of national laws or regulations
- In areas or for fish stocks in relation to which there are no applicable conservation or management measures [and where such fishing activities are conducted in a manner or inconsistent with State responsibilities for the conservation of living marine resources under international laws]

V. Summary of consideration to be provided by the meeting;

- ✚ *Indications made on elements to be addressed in the process to establish a MCS Network for the Andaman Sea including the importance of information sharing;*
- ✚ *The suitability of using the development of a “vessel record and inventory” as an initial field for cooperation;*
- ✚ *As recommended by the July 2009 expert meeting on Vessel Record and Inventory in Satun provide further comments to the forms for collection of information on small boats and larger vessels as to the applicability to the Andaman Sea Context;*
- ✚ *Comments made and recommendations to be provided on the suggested “institutional matrix” on Monitoring, Control and Surveillance as relevant to the Andaman Sea;*
- ✚ *Recommendations provided on landings by “neighbouring country” vessels and landing across boundaries (as a follow up to “port monitoring”) and the need to improve monitoring;*
- ✚ *A feedback provided by the Andaman Sea countries on the relevance of the shortened definition on the “Illegal”, the “Unregulated” and the “Unreported” or IUU fisheries as developed during the Gulf of Thailand meeting in March 2009*

TRADITIONAL KNOWLEDGE OF FISHING COMMUNITIES

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The traditional knowledge (TK) of fishing communities is defined as knowledge, innovations and practices of indigenous and local communities deriving from customary uses of biological resources and associated cultural practices and traditions, TK and its international legal instruments and all related programmes/initiatives from either international or regional organizations in Traditional Knowledge such as CBD, Jakarta Mandate, CBD COP 5 Decision V/6, FAO CCRF, The 2007 Siem Reap Statement and The 2009 Lombok Statement. Furthermore, the presenter acknowledged member of the meeting about The 2009 United Nations guidelines on TK called “An Assessment of Assessments: Some guidelines on TK”. The member also being informed with AoA: Further Guideline on TK.

In a nut shell, TK could broaden frontiers of scientific knowledge essential for integration on conservation and management into habitat protection and for developing effective mitigation strategies. Secondly, TK could help build up trust thereby improve legitimacy of conservation and management interventions which might help in developing participatory MCS regimes among the local communities. Lastly, TK could help the process of devolution and decentralization which is potent for the success of fisheries management.

SUMMARY ON LOCAL KNOWLEDGE IN LOMBOK, INDONESIA

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INTRODUCTION

The Workshop on Customary Institutions in Indonesia: Do They Have Role in Fisheries Resources and Coastal Management? Conducted by International Collective in Support of Fishworkers (ICSF) in collaboration with *Departmen Kelautan dan Perikanan* (MMAF) Indonesia in Lombok, West Nusa Tenggara, Indonesia from 2-5 August 2009. Representative from various organization such as *Panglima Laot Aceh*, *Sasi Maluku Tengah*, *Awig-Awig Tanjung Luar Lombok*, *Awig-Awig Lombok Utara*, *Sea-Farming Kepulauan Seribu*, *Ola Nua Lamalera Nusa Tenggara Timur*, *Parompong Sulawesi Selatan*, *Mane's Sulawesi Utara*, Marine Fishery Management Committee, Indonesian Traditional Fishermen Unity, Indonesian Fishermen Union, Northern Sumatera Fishermen Association, Indonesian Forum For Environment, People's Coalition of Fisheries Justice, Research center on Management of Marine and Fishery, Law Faculty of Pattimura University, Ambon, JALA, *Bina Desa* ICSF, Sustainable Development Foundation, Thailand, YADFON Foundation, Thailand, Penang Inshore fishermen Welfare Association (PIFWA) Malaysia, *Sahabat Alam Malaysia* (SAM), *Jaringan Orang Asal Malaysia*, Lanao Aquatic and Marine Fisheries Centre for Community Development (LAFCCOD), Philippines, Integrated Rural Development Foundation of the Philippines (IRDF) Inc., LIPI and CBCRM Learning Centre, Philippines attended the workshop.

CUSTOMARY INSTITUTIONS IN FISHERIES IN INDONESIA

Some information are learned from the workshop of the existing customary knowledge-based in fisheries management in Indonesia. The sample list of the customary institutions in Indonesia is as below:

No	Name of Fisheries Management Institutions System	Location
1.	Sasi Laut	Haruku, Ambon, Maluku
2.	Mane'e/ Mani'o	Talaud, North Sulawesi
3.	Parompong	Spermonde Islands, South Sulawesi
4.	Awig-Awig Tanjung Luar	Tanjung Luar, West Nusa Tenggara

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5.	Awig-Awig Lombok Utara	Gili Indah, West Nusa Tenggara
6.	Panglima Laot	Nanggroe Aceh Darussaalam
7.	Lamalera Whales Hunting	Lamalera, East Nusa Tenggara

In regards to the customary institutions-based fisheries management in Indonesia, there is a variety of situations related to the general principles of fisheries resources management, such as territorial boundary system, rules system, right system, sanctions system, monitoring and evaluation system and authority system. In Andaman Sea Region, the Panglima Laot Aceh is a well known local customary institution which is a good example to indicate some general principles of fisheries resources management based on customary institutions in Indonesia:

General Principles of The Panglima Laot Aceh, Sumatera					
Boundaries System	Rules System	Rights System	Sanctions System	Monitoring System	Authority System
Customary Based agreement, non-administrative boundaries	Based on local customary values since 400 years ago	Rights are allocated by Panglima Laot (access rights, resources allocation, use rights)	Based on customary values solved by “Majelis Peradilan Adat” (Customary Marine Court)	Undertaken by Panglima Laot	Held by Panglima Laot

LESSONS LEARNED FROM LOMBOK WORKSHOP

In October 2004, the Indonesian government issued the most comprehensive fisheries laws to emerge from the developing world through Law No 31/ 2004 on Fisheries. This Law is a revised version from the previous Fisheries Law No 9/1985. The main thrust of this fisheries legislation is on fisheries management. The goals of fisheries management include improving the living conditions of small-scale fishers and fish farmers, and optimum utilization of fishery resources. This Law also recognizes the role of customary laws and local wisdom as well as community participation in fisheries management. Any individual, except small-scale fishers and fish farmers, who derives direct benefit from the fishery resources within the fisheries management zone of Indonesia, would be subject to payment of levies that would be used for fisheries development and activities to ensure sustainable fishery resources and the environment.

The evolution from centralization to decentralization era has been re-started during Reform Era, with the enactment of Government Law (UU) of 22/1999 (the local autonomy law), which was then revised by the Law No 32/2004. The chance has been opened for a shift in fisheries governance system, the shift of regime from top-down to bottom-up approach, which encourages more participatory involvement of the

communities, has started through revitalization of community based system. The small-scale and artisanal fisheries sector is an important source of employment, income and food security, particularly for the poor, in Indonesia. The Indonesian government has developed several management programs that are based on the local community.

There have been some success stories of true community involvement in fishery management and most of them are traditional practice such as *awig-awig*, *panglima laot*, *sasi*. The so-called community-based fisheries management introduced by some projects has been mostly on an ad-hoc, project basis although these have been very helpful. There is a need to develop nested management systems, incorporated into fishery management planning and law, whereby clear roles for national, provincial, district and local stakeholders are defined. Rights and responsibilities of all stakeholders and resource participants need to be clarified. Also needed is a means of extend the usefulness of co-management of key resources beyond the fixed area approach. Means of defining all stakeholders and other management participants need to be developed for the Indonesian situation. Full participation of all stakeholders in developing realistic, successful, co-management programs is one of the major challenges, and opportunities, of decentralization. Techniques are also needed to develop, and improve, locally based management systems, including traditional ones, and local participation in larger management systems, without creating unnecessary dependence on various levels of government and external funding. The long-term goal is to have community based components truly local, and supported, and funded, by the fishery participants including dependent businesses.

During the centralized system the government issued a Basic Provisions of Local Government Law No. 5/1974 that asserted the local government did not have jurisdiction over marine and fisheries resources. And the only fisheries law at that time, the Fisheries Law No. 9/1985, did not clearly mandate fisheries to neither the local government nor local people.

During reform era in Indonesia, started in 1998, where at the first time the government has significantly modified the authority management rules by issuing the Autonomy Law No. 22/1999 then revised by Autonomy Law No 32/2004, which gave wider opportunities to the local government to manage certain waters areas under their authorities. This has provided a great challenge to the government especially to find out models for proper fisheries co-management and for this, fisheries co-management system is an alternative for restoring the condition of resources and resolving issues of fishing rights. The involvement and partnership of all stakeholders in the fishery management process in this system is the key.

LESSONS LEARNED FROM FISHING VESSEL REGISTRATION WORKSHOP IN SATUN PROVINCE JULY 2009

Mangrove Conservation Group (Kok Payom Village)

Kok Payom(moo 18), is located in La-Ngu district, Satun province, with population at 666 from 132 households. A majority of population are muslim (80%). The major occupations are agriculture, fisheries, employee and business. People in the community have been engaged with mangrove and related resources for long times.

The six main visions of this village are 1) to obtain full (and sustainable) supplies of natural resources; 2) to uphold religion, art and culture; 3) to promote good moral in living; 4) to promote economic sufficiency strategy; 5) to develop a source of knowledge-base; and 6) to maintain harmony in the community.

After the cancellation of Mangrove concessions in 1995 goat farming was introduced in the Mangrove area. Gradually the community realized the rate of degradation of mangrove forest in this area and its impact. Hence, people in the village organized themselves and joined hands in the mangrove forest restoration. Later on this led to the establishment of the Mangrove Conservation Group.

Villages in La Ngu District were separated in 2003. At about the same time the Mangrove Conservation Group were established. In the same period the villagers also formed fishing groups who, among other things, engaged in fish cage culture. In the end of 2004 the area was impacted by the Tsunami. In support of rehabilitation many organizations provided assistance to the villages for e.g. Had Yai University, Satun Provincial Fisheries Office and the Bureau of Agriculture. In the process of rehabilitation the groups formed by the villagers proved to be valuable in getting back to normal. Since establishing the groups and the organization of the community and after the tsunami many activities have continuously been implemented.

Since its inception the Mangrove Conservation Group the villagers involved has implemented many activities. The success of the work done by the Group has led to recognition by many and the Group and the areas have become well known. Many visitors are now coming to area to see and learn from the experiences of the Group. Currently, the Mangrove Conservation Group has also started to promote agro-tourism activities with support by Thailand Research Fund) TRF(. with funds allocated for “Local Research. To develop the concept further the objectives of the local research project are to study information of environment, the community as such, community organizations, identification of attractive places, and to identify interesting aspects of local resource management. Social aspects are key in the perspective and the groups look to develop learning potential of villagers and members of the village groups and in the process it is seen as important to figure out the practical aspects of agro-tourism that are in line with the community’s way of life and culture. To maintain a balanced and sustainable development, studies of the carrying capacity of the area is included.

Satun Small-scale Fishery Association

The Satun Small-Scale Fishery Association is composed of 75 villagers, which are divided into three categories, as follows:

- 20 villagers are responsible for resource management and profession
- 34 villagers are responsible for resource management and saving
- 11 villages are responsible for resource management and saving and profession.

The activities of the Association include establishment of the groups for resources management/enhancement, coordination with other relevant agencies in the province and support the villagers to establish sub-groups; to find alternative livelihood; to develop community shops/business/fish landing; etc. (under framework and regulation of the association).

This Association has been successful in that all vessels of its members are registered information collection is well implemented. Satun was one of province affected from Tsunami – 26 December 2004 and this Association has seen it has an important role to ensure the availability of improved information collection as well as to have a total boat owner registration to be more prepared for future hazards.

Moreover, this Association provided assistance to Tsunami affected member by collecting information on the damages and through coordination with other agencies in generating assistance. The Association also provided assistance in term of facilities such as houses, boats, engine, etc. to members and supported the fishing communities/groups (with revolving funds). Furthermore they supported the establishment of a radio communication center and in general actively supported the recovery of the community as a whole.

Present situation

- Out of 3,200 fishing boats 1,600 fishing boats are registered in Satun. 695 boats are owned by the members of the Association
- Reliability of information on boats registration has been improved
- The system to strengthen collaboration/coordination with governmental agencies is established
- The set of information collected by the association for sustainable management and conservation: (1) owner name, (2) boat name, (3) boat size, engine, and (4) fishing gear and operation (type, fishing ground, fishing season, target catch, etc.). This information will be updated every year during November to December, to be shared with the provincial office.
- Provincial central bank managed by the Association

Community-based Fishing Port (Khon-Klan Village)

Khon-Klan village (Moo 3, Tung Wa district, Satun province) have a population of 525 people in 127 households. The major occupations are fisheries and agriculture.

Over the past 25 years mangrove concessions were cancelled as a result of mangrove degradation. Many people turned to engage themselves in the fisheries sector, however, they had to face the monopoly of the fish buyer. The buyer provided loans to fishermen in term of fishing gears, boats, fuel, etc and in turn the fishermen had to sell their catches to this buyer. However, the buyer held down the price of fish causing most of the fishermen to go into debt. To solve these problems, the idea of the establishment of “the community fishing port” was initiated among local fishermen in order to gain better prices for their catches.

La Ngu Bay local fishermen network was established in the mid of 1997 (2540) and later approached the “Satun Small Scale Fishery Association”. Khon-Klan village joined the Association in 1999 (2542) with the common aim to rehabilitate the marine resources in the Andaman Sea. In 2000 (2543), a Savings Group was formed in Khon-Klan village.

Since the establishment of the Savings Group of Khon-Klan village they wanted to be free from the debt, therefore, they created the concept of community-based fish market.

After getting funding support from the Association they constructed a landing site with a building. Furthermore they also provided following services:

1. To buy catches from members (local fishermen) and daily transport fish to market
2. To sell gasoline for fishing operation
3. To arrange for fishing gears to be bought by members

In the mid of 2005 (2548), the group agreed on a long term work plan for livelihood improvement of fishermen, which are composed of 1) setting up of a central fish market for local fishermen 2) assist fishermen in providing fishing gears including a local welfare shop, and 3) in the longer term plan, help fishermen to repay debts 4) generate support to the central fish market concept.

The idea of central fish market was developed by looking at the benefits of combining 4 groups of separate community fish markets into a central network namely the markets of: 1) Khon-Klan moo 3 community fishing port; 2) 2,000 fishing port; 3) Ban Klong Dukang fishing port; and 4) Saving fishing port. The profits from the central community fishing port is divided on a percentage basis and allocated to:

1. The central fishing port's shop for administrative expense, charity fund, fishing gears and circulating incomes
2. The central fishing port for the management of the port
3. The group members
4. Individual member to stimulate outsiders to cooperate with the central market
5. Administration committee bonus
6. Welfare of community fish markets
7. Coastal resources restorations such as fingerling releasing, mangrove reforestation.

CONCLUSION

The Panglima Laot Aceh and Satun Province Local knowledge are two examples of local systems that are providing good planning and management of fisheries and habitats. Moreover, these two institutions have also provided a good partner in co-management either with the province or district level in their area. This in turn has made them good advocates in fisheries and habitats management. The examples are also important as their history are quite different in that the Paglima Laot Aceh origin goes back several hundred years while the community organization in La Ngu District is much more recent. Both of the examples are based on organizational abilities within Muslim communities.

CLIMATE CHANGE AND THE ANDAMAN SEA MEETING

Magnus Torell

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Climate change refers to the variation in the Earth’s global climate or in regional climates over time caused by processes internal to the Earth, external forces (e.g. variations in sunlight intensity) or, more recently, anthropogenic (human-causes) factors. Intergovernmental Panel on Climate Change (IPCC) and United Nations Framework Convention on Climate Change (UNFCCC, 1992)¹ presumed that human activities which are increasing levels of CO₂ and other ‘greenhouse’ gases in the atmosphere is leading to a rise in temperature and changes in the climate (<http://unfccc.int>). There is a strong scientific consensus considers that coastal marine ecosystem is threatened by anthropogenic global climate change (IPCC, 2001; FAO, 2007). Coastal habitats and resources are likely to be impacted through sea level rise, warming sea temperature, increased unpredictability of storms and typhoons, extremes of nutrient enrichment (eutrophication) and invasive species. The alteration of the values of parameters that are customary used in fishery management models to estimate optimal production, yield, and levels of stock will also be affected by any significant environmental change (Rothschild, 1996). Whether the oceans will prove sufficiently supportable to provide an adequate supply of fish as food for future generations will depend in part on how well we do in managing the resource and our ability adapt to emerging changes.

“Globally” perceived Impacts to Fisher-folks/Fisheries Resources

Some of the globally perceived potential impacts to fisheries and fisherfolk as expressed in international and documented by FAO (2007) and other institutions and authors (Rothschild 1996), would in summary include:

Distribution of fish stocks

- Changes in sea surface temperature will likely change structure and function and distribution of stock of fish from one region to another, including the availability and distribution of plankton.

¹ All SEAFDEC Member Countries have ratified, or acceded to the United Nations Framework Convention on Climate Change (UNFCCC, 1992) and all Members, except Brunei Darussalam have ratified or acceded to the Kyoto Protocol to the United Nations Framework Convention on Climate Change, 1997. Under the UNFCCC, 1992, countries develop strategies to address climate change and supports cooperation in adaptation to the impacts. Under the Kyoto Protocol, 1997, binding targets and standards are set to reduce emissions of greenhouse gases

- A slight change in ocean temperature could result in systematic shifts in stocks of certain species from one nation's EEZ to that of an adjoining country. On a more local scale, a geographic shift in stocks within the boundaries of an EEZ would be felt economically by local or regional industries, and might most severely impact the subsistence fishers in the developing countries

Increased hazards to fishermen and fish dependent people (inland and offshore)

- Incidence of extreme events such as floods, droughts and storms increased by climate change will affect the safety and efficiency of fishing operations and increase damage and disruption to coastal and riparian homes, services and infrastructure;

Impacts to rivers, floodplains and inland fisheries

- Sea level rise, melting of glaciers at the headwaters of major rivers and other large-scale environmental changes will have unpredictable effects on riverine, coastal and wetland environments and livelihood and in the short term, climate change is expected to impact freshwater and estuarine fisheries. This would have implication on employment and vital sources of protein for poor people.
- Dry-season flow rates are predicted to decline in south Asia and in most African river basins, resulting in reduced fish yields. For river fisheries, downstream impacts from adaptations by other livelihood sectors are a concern. In particular, conflicts exist between agriculture needs and fish productivity, and the effects of reduced flows and floodplains on seasonal spawning

Impacts on coastal fisheries and fishing communities

- Coastal fishing communities could be at risk facing an exposure of reduced fisheries resources and increased risks of coastal flooding and storm surges because coastal habitats and resources are likely to be affected through sea level rise, warming sea-temperature, extremes of nutrient enrichment (eutrophication) and invasive species.
- Poor coastal communities around the world have been supported by coastal fisheries in wetlands, estuarine, inshore, coral reef and open sea resources risk losing some of their livelihood base as many coastal fisheries resources are potentially vulnerable to impacts of climate variability.

Implications due to links and combined effects in different sectors

- Complex links between climate change, fisheries and other sectors will have indirect effects including fisheries being affected by changing water demands from agriculture, changing prices of and access to aquaculture feedstuffs and diversion of government and international financial resources away from fisheries management and into emergency relief after extreme weather events.

Climate change and the Andaman Sea

The monsoon pattern around the Andaman Sea combined with geographical features such as coral reefs, mangrove areas, sea-grass beds – and for the inland areas of Myanmar vast flood-plains and wetlands - and other critical habitats are unique to the region and provide

the basis of the ecological specificity as well as some protection against natural hazards and in support of reduction of perceived effects of climate change.

Poor coastal villagers are also pressured from expansions of urban, industrial and tourism development often resulting in a push to move families and whole villages often leading to increased competition for fish with other villagers in places where they try to settle down. This together with increased clearance of mangroves for urban and industrial development, shrimp farming and other uses leaves the coastal villages more exposed to natural hazards and climate change. In the process traditional knowledge on how to “live with the sea” and how to manage and maintain coastal habitats is rapidly being lost.

Climate change and changes in the monsoon pattern can have far-reaching effects on coastal livelihoods and availability of fisheries resources in marine as well as in fresh water. Smaller coastal villages throughout the region are facing hardships due to the impact from natural hazards such as storms, tornados, floods, etc. The coastlines of the Andaman Sea are exposed as were seen in 2008 with cyclone Nargis in Myanmar leading to losses in lives, boats and equipment. Lessons learnt from disasters like these should be incorporated into efforts to, given the specific geographical situation, integrate fisheries management into habitat management and coastal management. This could include safety and rescues at sea, keep records on available boats, etc. This should also include efforts to build resilience, incorporate local knowledge and to restore important, and protective, coastal features and habitat. The work to mitigate effects caused by natural hazards should not only be viewed based on common seasonal monsoon patterns in Southeast Asia but also, and increasingly so, in the perspective of **climate change** that threat to further expose already vulnerable coastal villages and fisher-folk.

Furthermore, some of the developments in coastal areas of Southeast Asia are, if not properly controlled, contributing to climate change as well as for the changes in the local climate and environment. A reversal of present trends of coastal environmental degradation could, in fact, be important in order to reduce effects caused by natural hazards. In the process of rehabilitating important coastal habitats (such as mangroves) and geographical coastal features (such as sandy beaches) to be able to maintain critical areas for various fish species during their lifecycle this should, ideally, be done incorporating plans to restore protective features as well as to mitigate potential effects caused by climate change.

In the protection of fisheries resources and the environment there is a call for fisheries and environmental authorities to come together and start integrating fisheries management with habitat management and in the process involve authorities responsible for development and spatial planning in order to build up a common position to seek ways to ensure that development in coastal (and inland) areas taking due concern to the aquatic resources and the marine environment. In this process it is important to find ways to assess potential impacts of climate change and how that will affect availability of natural resources and aquatic products. Without action, fishing pressure, fishing conflicts and conflicts with other uses are likely to increase, and will lead to resource depletion through environmental degradation and/or through heavy fishing. These issues call for strong collaborative efforts, at different levels, to curb the escalation. Furthermore, reports on the importance of specific geographical features in the coastal areas for protection against natural hazards should be assessed and addressed in the development of management plans and in the perspective of potential impacts of climate change.

An analytical problem is how to distinguish changes caused by climate change from changes that are due to over-fishing, encroachment and exploitation of marine and coastal habitats and other destructive practices. The “problem” should not be seen as a problem but rather to strengthen the imperative to act now and not wait for “global” solutions. However, it is important that capacity is being built up to report on actions and results to different audiences, including those addressing climate change and adaptation.

Focal areas: where to expect interventions by fisheries and related agencies

There is an obvious need to develop more enlightened policies on how many fish should be taken where and when, as well as the more effective application of such policies, both nationally and internationally. At present we have little capability to forecast how environmental changes affect recruitment, and limited knowledge of how species interact with one another in the ecosystem or in the fishery. The most important needs are extensions of existing theories of natural production, and the development of enhanced data systems to support them. Brief reference to areas that would need attention, not only in the perspective of climate change, to improve fisheries and coastal management would include¹:

- Plans to be worked out to integrate fisheries management into habitat management is aiming that aim to include schemes to build capacity in protection against natural hazards and to mitigate effects of climate change, as practical given the geographical situation, thereby providing a basis for human adaptation
- Build up resilience among coastal – and inland – fishing communities
- Encourage the dissemination and use of traditional and indigenous knowledge to mitigate the impact of disasters and promote community-based disaster management planning by local authorities, including through training activities and raising public awareness
- Restore and maintain/protect important habitats and coastal features to mitigate effects of increased natural hazards caused by climate change – fisheries agencies should actively help identify those of specific importance to commercial fish stocks
- Make research capacity available, including research vessels as feasible, to undertake surveys of possible impacts on ecosystems and available fish resource due to change in temperature, rains, winds and currents
- Safety at sea, vessel record and inventory – simple early warning systems
- Involve fisheries agencies in the cooperation for the prevention and mitigation of, preparedness for, response to and recovery from disasters with an adverse impact on the environment in order to enhance the capabilities of affected countries to cope with situations the could occur following climate change.
- Develop, with regional partners and national institutions priorities for the restoration and maintenance of geographical features in coastal areas (mangroves, sandy beaches, etc – especially with respect to aquaculture and coastal infrastructure)
- Initiate work, with regional and national partners, on simple assessments on how levels of productivity in coastal areas and *refugia* might/will change over time due to changes in geographical and hydrological features in coastal areas (leading to adjust allowed fishing)

¹ Note: Several of these aspects are referred in some SEAFDEC activity plans, such as those submitted to Sweden in follow up to the tsunami, as well as in the proposal for continued cooperation with Sida from 2008 onwards

To be able to reduce impacts from the fishing sector there is a need to:

- Review various parts of the fishing sector, capture fisheries (marine and inland) and aquaculture, to assess levels of emissions and energy use with a view to work out plans for reduction.
- In support of the assessment of energy consumption establish an inventory and record of vessels and gear presently in active use

Finally a general point, in line with FAO recommendations, 2007, is that a better understanding of the contribution of fisheries to poverty reduction and better data on the number of people reliant on small-scale fisheries are required to understand the potential impact of climate change on poverty. The relative risk of climate change on fisheries sectors also need to be understood in the context of impacts on other natural resource sectors and on other hazards that result in high levels of poverty, including food insecurity, epidemic disease, conflict, political marginalization, inequity and poor governance.

The meeting is invited to discuss and recommend on:

- Needs for capacity building, capacity to increase resilience and capacity to adapt to effects of climate change and increased unpredictability in weather patterns.

The need to increase understanding of climate change and links to fisheries/habitats, contributions from the fishing sector to climate change (energy consumption) and various fields where adaptive meas

BAY OF BENGAL LARGE MARINE ECOSYSTEM PROJECT

Dr. Rudolf Hermes

Bay of Bengal Large Marine Ecosystem Project
FAO Regional Office for Asia and the Pacific (FAO/RAP)

Bay of Bengal region covers 3.9 million km², where there are 8 countries directly bordering the Bay of Bengal. The BOBLME project is aimed *to establish a strategic action programme to protect the health of the ecosystem and manage the living resources of the Bay of Bengal on a sustainable basis to improve the food and livelihood security of the region's coastal population.* The critical fisheries management and environmental health-related issues in the Bay of Bengal which include over-exploitation of the fishery stocks, habitat degradation, and land-based pollution which have lead to uncertainties on whether the ecosystem would be able to support livelihoods in the future.

It was mentioned that Andaman Sea is a distinct, relatively well defined marine eco-region within the Bay of Bengal Large Marine Ecosystem and could clearly benefit from joint management using EAF. Any move in this area to promote offshore fisheries will lead to more trans-boundary issues requiring resolution: resource assessment, status of exploitation, capacity management, etc. Furthermore, fishery *refugia* as a fisheries management tool are suitable for an Andaman Sea wide approach (e.g. as MPA network).

It was commented that Myeik or Mergui Archipelago joint management between Myanmar and Thailand could serve as exemplary unit for scaling up of critical habitat protection (e.g. collaborative research, assessment, livelihoods and capacity building activities). Therefore, Andaman Sea forum or network to foster information exchange, policy harmonization, and collaborative action also on ecosystem health or pollution control issues, including protection of offshore habitats or trade-related topics.




**First Meeting of the Andaman Sea Sub-region
20-22 October, Phuket, Thailand**

Organized by SEAFDEC-SIDA Project
in collaboration with BOBLME

1

Bay of Bengal Large Marine Ecosystem



3.9 million km²
8 countries
over 400 million people

2


Rapid population growth and high dependence on aquatic resources for food, trade, livelihoods, increased land use are having major impacts on the marine ecosystem




The Bay of Bengal is experiencing

- over-exploitation of fish stocks
- habitat degradation
- land based pollution
- uncertainty whether the ecosystem will be able to support livelihoods in the future

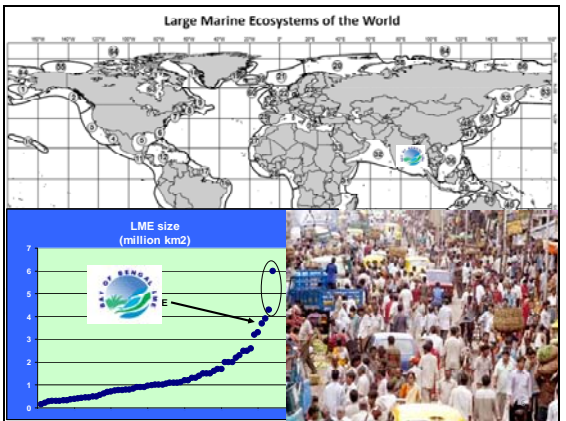
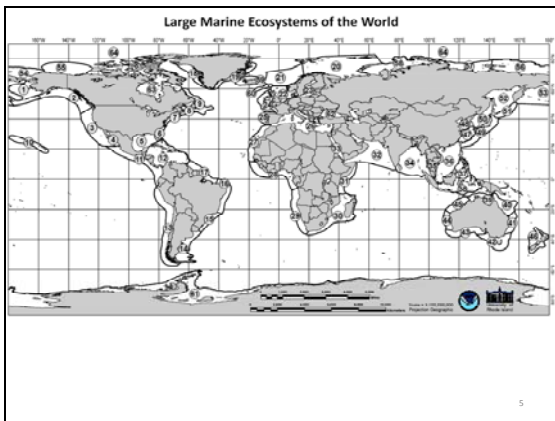
3



“to establish a Strategic Action Programme to protect the health of the ecosystem and manage the living resources of the Bay of Bengal on a sustainable basis to improve the food and livelihood security of the region’s coastal population”




4



The BOBLME Project has five components:



1. Strategic Action Programme
2. Coastal / Marine Natural Resources Management and Sustainable Use
3. Improved Understanding and Predictability of the BOBLME Environment
4. Maintenance of Ecosystem Health and Management of Pollution
5. Project and Knowledge Management



Component 1: Strategic Action Programme (SAP)

- Finalize Transboundary Diagnostic Analysis (TDA)
- Establish BOB management arrangements
- Devise a sustainable financing mechanism
- SAP formulation and adoption


8



Component 2: Coastal / Marine Natural Resources Management and Sustainable Use

- Promote community-based management
- Improve policy harmonization
- Facilitate regional fishery assessments and management plans (3)
- Collaborative critical habitat management


9



Component 3: Improved Understanding and Predictability of the BOBLME Environment

- Improved understanding of large-scale processes and dynamics affecting the BOBLME
- Promote use of fish refugia / MPAs to conserve regional fish stocks
- Improved regional cooperation with regional and global assessment and monitoring programmes


10



Component 4: Maintenance of Ecosystem Health and Management of Pollution

- Establishment of an effective ecosystem indicator framework
- Development of a regional approach to identifying and managing important coastal pollution issues

11



Component 5: Project Management

- Establishment of the Regional Coordination Unit
- Monitoring and evaluation system
- Project information and dissemination system

12

The quest for partners for effective collaboration...



UNEP, UNDP, FAO, IUCN, ICRI, NACA
MFF, IOSEA, SEAFDEC, WFC, WWF
BOBP-IGO, ICSF, fisher organizations
COBSEA, SACEP, SASP, IOGOOS
ASEAN, IOTC, SAARC, BIMSTEC, ADB

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Status of the project

- RC and CTA in place
- Clarification of the project document carried out: activities, project linkages, stakeholders and budgets
- Timelines for 2009/10 developed
- Inception Meeting under preparation for November
- Follow-up on project signatures
- Confirmation of National positions and bodies (NC, PSC)
- Building relationships

14

Building Partnerships for Project Implementation

- Promotion of ecosystem approach to fisheries and aquaculture in the BOB (FAO-APFIC Workshop, Colombo, Sri Lanka)
- Support to the Indian Ocean Cetacean Symposium, Marine Research Centre, Maldives
- Joining UNDP, UNEP, IUCN, CARE and Wetlands International in providing oversight to the Mangroves for the Future (MFF) Initiative (Regional Steering Committee Meeting)
- South Asia sub-regional consultation on shark conservation and management with BOBP-IGO
- Participation in assessment of fish stock status in South and Southeast Asian countries with SEAFDEC and FAO

15


First Meeting of the Andaman Sea Sub-region

- Andaman Sea is a distinct, relatively well defined marine ecoregion within the Bay of Bengal Large Marine Ecosystem and could clearly benefit from joint management using EAF
- Any move to promote offshore fisheries will lead to more transboundary issues requiring resolution: resource assessment, status of exploitation, capacity management...
- Fish refugia as a fisheries management tool are suitable for an Andaman Sea wide approach (e.g. as MPA network)
- Myeik or Mergui Archipelago joint management between Myanmar and Thailand could serve as exemplary unit for scaling up of critical habitat protection (e.g. collaborative research, assessment, livelihoods and capacity building activities)
- Andaman Sea forum or network to foster information exchange, policy harmonization, and collaborative action also on ecosystem health or pollution control issues, including protection of offshore habitats, biodiversity of sea-mounts, or trade-related topics

16

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17

MANGROVE FOR THE FUTURE

Don Mcintosh

Coordinator, Mangroves for the Future
IUCN Asia Regional Office






Mangroves for the Future
INVESTING IN COASTAL ECOSYSTEMS

MFF – A unique partnership for healthy coasts, ecosystems and communities in the Indian Ocean

Why MFF..?

- Post-tsunami, a wealth of experience built up, but only as a reactive response
- Little coordination or longer term planning / integration
- Threats to ecosystems and livelihoods existed before the tsunami, still remain, and are increasing and changing
- Environmental activities continue to be under-invested in







A common vision






a more healthy, prosperous and secure future for all coastal populations in Indian Ocean countries, where ecosystems are conserved and managed sustainably

Where we work...

Focal countries: India, Indonesia, Maldives, Seychelles, Sri Lanka, Thailand
Dialogue countries: Bangladesh, Kenya, Malaysia, Pakistan, Tanzania, Viet Nam
Plus: offer of support to Myanmar after Cyclone Nargis

MFF in summary...

- **Policy relevant** – supporting national legal and policy frameworks
- **People centered** – assisting coastal populations of the Indian Ocean region
- **Partnership based** – seeking to meet the needs of all partners

Partnerships for implementation...



SECRETARIAT


Regional Steering Committee



National Coordinating Bodies
(Government, NGOs, CBOs, Private Sector)


Project Project Project Project Project Project

Implementation schedule...



	2007	2008	2009	2010	2011
Setup and establishment	█				
Preparatory studies	█	█			
Small and Large MFF projects (Phase 1)		█	█		
Phase 2: 2010-12		█	█	█	█

From strategy to action...



15 PROGRAMMES of WORK guide implementation:

Knowledge	Empowerment	Governance
<ul style="list-style-type: none"> • Knowledge base for coastal management • Ecologically and socio-economically sound rehabilitation • 'Reef-to-ridge' approaches • Ecosystem valuation • Environmental evaluation of post-tsunami response 	<ul style="list-style-type: none"> • Civil society awareness and participation in decision-making • Building capacity of coastal managers • Environmentally sustainable livelihoods • Community resilience to natural disasters • Sustainable financing mechanisms 	<ul style="list-style-type: none"> • National integrated coastal management programmes • Environmental and social safeguards in land use planning • Marine and coastal protected areas • Adaptive coastal management • Environmentally sound business practices

Climate change considerations are integrated into all PoWs

Small Grant Projects India




v. **Critical evaluation of alternate livelihood programmes implemented for reducing dependence on Sundarbans Mangroves and its ecosystem**

- Aims to help conserve the largest mangrove forest of the world- Sundarban through development of an institutional platform for sustainable development based on an ecosystem management plan.





Small grant projects India



III. **Status of shelter belts in coastal line**


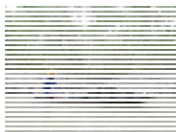


Environmental Protection Training and Research Institute EPTRI

- Baseline study to:
 - Assess the **existing status** of coastal **shelter belts** in Southern States

Small Grant Projects Thailand

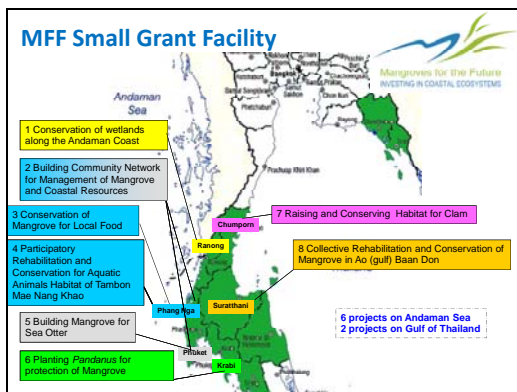
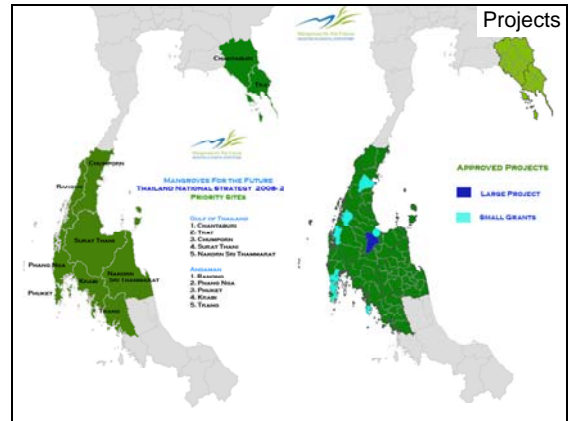
- Project:** Collective Rehabilitation and Conservation of Mangrove in Ao (Gulf) Baan Don
- Location:** Phunphin District, Surathani Province

A local fisherman applying simple gears is able to make a sustainable living through the provisions of the recovering coastal ecosystems. Several kinds of birds were spotted, and in a good day, monkeys would hang around in the forest. The canal is being used for eco-tourism the subject selected for a case-study.



Out into the sea, another simple fishing gear is applied. Wood stakes were driven into the soil, net were put surrounding them to get a catch. The project has been monitoring the use of fishing gear at various locations.

As a result of community effort against destructive fishing (pull and drag nets by trawlers several year ago), estimated million of trees in the coast of Tambol Letlet have been growing this high. It is interesting to see the similar condition in other locations of the project.



New Projects, e.g.

- Community involvement in the Ranong Biosphere Reserve
- Management Effectiveness of MPAs in Thailand

Sharing knowledge...

- Regional Strategy & Action Plan
- NSAPs
- Website
- E-Newsletter
- Documents
- Training courses
- Events




SCIENTIFIC AND TECHNICAL SYMPOSIUM ON SUSTAINABLE MANGROVE ECOSYSTEM MANAGEMENT
23-25 November 2008, Ranong, Southern Thailand

MAP OF ANDAMAN SEA AND SOUTH CHINA SEA, ASIA

