Improving Data Collection on Sharks in Southeast Asia: Regional Approach to Address CITES-related Concerns

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The possible inclusion of economically-important shark and ray species in the CITES Appendices proposed during the CITES-CoP16 in March 2013, is bound to happen after September 2014. It is therefore urgent to review the literature and other relevant data and information on these species to be able to synthesize the implementation of CITES-related matters, improve data collection on sharks and rays in Southeast Asia, and develop a regional approach for addressing such concern. It has been recognized that in the Southeast Asian region, sharks and rays are incidental catch and for such reason, recording of data on sharks and rays is generally made by group and not by species. Through a series of regional technical meetings including the recent Regional Workshop on Data Collection Methodology for the Assessment of Shark Stock Status in October 2013, it was recommended that data collection on shark and ray species should be initiated by SEAFDEC starting with some major species, such as the CITES-listed species, *e.g.* hammerhead and oceanic whitetip sharks, and manta rays. The same concern was also raised during the Sixteenth Meeting of the Fisheries Consultative Group (FCG) of the ASEAN-SEAFDEC Strategic Partnership (ASSP) in November 2013 in Penang, Malaysia. In this regard, SEAFDEC would initiate the development of a standardized data collection sheet for the countries in the Southeast Asian region to record the Sharks CPUE data specific to the types of fishing gears and logbooks focusing on sharks and rays. SEAFDEC in close collaboration with the Member Countries would also developed the plan of activities in pilot areas in the Andaman Sea (Myanmar, Thailand, and Indonesia); Gulf of Thailand and South China Sea (Thailand, Malaysia, and Vietnam); and Sulu-Sulawesi Seas (Indonesia, Malaysia and Philippines).

During the Sixteenth Meeting of the Conference of the Parties (CoP16) to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) on 3-14 March 2013 in Bangkok, Thailand, five out of seven proposals to list commercially-exploited aquatic species in the CITES Appendices had been accepted. This means that the inclusion of shark and ray species in the CITES Appendices proposed during the CoP16 will put in place the measures in 18 months from the CoP16, *i.e.* in September 2014. Thus, the Parties must now be preparing for the implementation of the upcoming listings of several shark and ray species, including the oceanic whitetip shark (*Carcharhinus longimanus*), scalloped hammerhead shark (*Sphyrna lewini*), great hammerhead shark (*Sphyrna mokarran*), smooth hammerhead shark (*Sphyrna zigaena*), porbeagle shark (*Lamna nasus*), and manta rays (*Manta* spp.) (**Fig. 1**).

Concerned by such predicament, the SEAFDEC Council during its 45th Meeting in April 2013 recommended that SEAFDEC should review the region's information on shark and ray resources as well as the conservation measures in order to obtain scientific evidence on the status of the stocks of sharks and rays. In this connection, SEAFDEC was encouraged to cooperate closely with FAO and relevant organizations in jointly addressing such CITES issues, while FAO was asked to also consider not only the development of scientific advice but also raising practical and general problems associated with CITES listings of aquatic species such as the non-detriment findings (NDF), and the inertial nature of CITES decisions, *i.e.* once a species is listed this will not be easily delisted. In addition, SEAFDEC was also requested to seize the opportunity of utilizing the commitment made by the European Union (EU) to provide funds for capacity building in activities related to the listing of marine species in the CITES Appendices for the benefit of the countries of Southeast Asia. Such activities could focus on shark-related aspects particularly on taxonomy, NDF and in updating the information on marketing of shark products in the region.

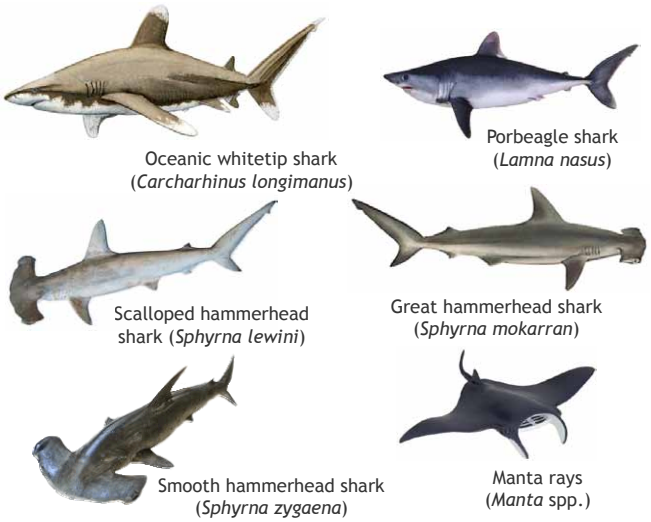

Fig. 1. Shark and ray species to be included in the CITES Appendices in September 2014

In this regard, the ASEAN Member States were encouraged to convey to the CITES Secretariat responsible for capacity building, their requests for funding support from the EU funds for sharks, and were assured that the SEAFDEC Secretariat would follow-up such requests with the CITES Secretariat. Meanwhile, the SEAFDEC Training Department (TD) organized the Regional Workshop on Data Collection Methodology for the Assessment of Shark Stock Status on 23-25 October 2013 in Bangkok, Thailand under the FCG/ASSP Framework funded by the Japanese Trust Fund (JTF). During the Workshop, the actions of the Parties by 14 September 2014 were discussed and clarified

Box 1. Shark Data Collection Systems of SEAFDEC Member Countries

Brunei Darussalam

Sharks landed in Brunei Darussalam are not target species but are incidental catch from fisheries targeting other commercial value species. Four shark species listed under CITES are found in the country's waters, namely: *Carcharodon carcharias*, *Cetorhinus maximus*, *Rhincodon typus*, and *Pristis microdon*. In the country's Fisheries Order 2009 on issuance of fishing license, a condition prohibiting the catching of any species of sharks is included and that sharks caught as incidental catch must be released back to the sea in good condition. As for the conservation and management of shark resources, the country's effort is challenged by insufficient data on the status of stocks of sharks as well as on spatial and temporal distribution of sharks, inadequate number of trained personnel to focus on shark identification and biology, and lack of specific research solely focused on sharks as current researches are mostly undertaken as part of other research studies such as stock assessment surveys using trawl (Matzaimi Haji Juna and Azri Waliyuddin Haji Nasir, 2013).

Cambodia

Studies on marine living resources including sharks and rays have not been undertaken in detail in Cambodia, but Tana (1996 and 1999) and Jensen and Try (2002) reported that 20 species of sharks are found in the country's waters, including the whale shark which is a rare species. The country has not developed any collaborative mechanism with commercial or large-scale industries to collect data and information on sharks, and as a result, data on sharks are reported in the official statistics of the Fisheries Administration as part of the country's total marine fish production. Reports also indicate that shark products (meat and fins) are consumed locally in the coastal areas of Cambodia and nearby cities. The domestic market price of shark's meat is about 7,000-8,000 riels/kg (around US$2.00 /kg) in the coastal areas, while the country does not export processed sharks (Suy Serywath, 2013).

Indonesia

Shark fishery in Indonesia has been going on for a long time, but data collection on sharks started only in the 70s. Based on the country's available statistics, eleven species groups are reported with five groups of sharks recorded separately, namely: thresher sharks, hammerhead sharks, dogfish sharks, mackerel sharks/makos, and requiem sharks. Meanwhile, rays are classified into six groups, namely: stingrays, manta rays, eagle rays, shovelnose rays, white-spotted wedge-fishes, and sawfishes. The country's NPOA-Sharks developed in 2010 still awaits the approval of the Minister. The NPOA-Sharks identifies key issues for the management of the country's sharks and rays, and the key actions to be undertaken such as review of the status of shark and ray fisheries, data compilation and collection methods and processes, among others. Nevertheless, some elements of the NPOA-Sharks have been carried out such as identification of sharks landed by species, training of enumerators, and conduct of annual review of relevant documents on sharks and rays. Data collection on sharks is still difficult to undertake considering that artisanal fishing boats unload the sharks caught in remote small landing sites, while species identification remains a major issue because only part of shark's body is landed (*e.g.* fins) at ports. Research, publication and information of shark fisheries are also limited, while there is little information on biological data of sharks species landed. Therefore, stock assessment of sharks in Indonesia has not yet been conducted (Diding Sudira Efendi and Dian Novianto, 2013). However, an Indonesian local government in Raja Ampat District took a major leap by issuing Local Government Regulation No. 9 in 2012 prohibiting the fishing of sharks, manta rays and certain types of fish in the marine waters of Raja Ampat. The said regulation stipulates that anybody caught hunting any species of sharks or manta rays will be jailed for at least six months and pay a fine of Rupiah 50.0 million (US$ 5148.00). Such important initiative taken by this local government contributes and supports the achievement targeted in the national conservation program on sharks and rays (Anonymous, 2013).

Malaysia

As a signatory to CITES, Malaysia has an obligation to implement measures to ensure the international trade of products of shark species is protected under the convention and is both legal and sustainable, as per the CITES Section, Fisheries Biosecurity Division, Department of Fisheries Malaysia. The country is also committed to enhance its efforts in the management and conservation of sharks and rays, and to report the results of such initiatives at regional and international fora. In this regard, the country has been undertaken measures to continuously improve its relevant policies and regulations under the current legal frameworks (Ahmad Ali, 2013). After the CITES-CoP16, Malaysia planned to amend its International Trade in Endangered Species Act 2008 (Act 686) to ensure that trading of hundreds of species including their parts and derivatives is controlled by various national authorities, and to control import and export, re-export and introduction from the sea, possession, transit, breeding or propagation of species listed under this Act. In addition, NPOA-Sharks with the main objective of ensuring the conservation and management of sharks and their long-term sustainable utilization was developed by the Department of Fisheries Malaysia to initially cover the period 2006-2010 but extended to 2013-2017 under NPOA-Sharks (Plan 2). Several issues on catch data collection on sharks had been reported, such as inadequate knowledge on taxonomy of elasmobranches (high diversity of sharks (63 species) and rays (83 species)) and staff involved in data collection considering the number of private jetties, *e.g.* in Perak State alone there are more than 500 (>2000 fishing vessels), manpower to sample more vessels at district level is insufficient. Meanwhile, some staff with experiences in taxonomy are usually transferred to other divisions, and funding support from the government is limited to conduct extensive research for the whole country (Abd. Haris Hilmi bin Ahmad Arshad and Ahmad bin Ali, 2013).

Box 1. Shark Data Collection Systems of SEAFDEC Member Countries (Cont'd)

Myanmar

Shark fisheries in Myanmar are small-scale utilizing wooden boats with engine of not more than 25 hp. Most of the country's shark landings are incidental catch as there are only very few dedicated elasmobranches fishers. Elasmobranches are caught as by-catch in bottom trawl and gillnet fisheries. However, there is still no specific data on shark fisheries compiled by the Department of Fisheries notwithstanding the Department of Fisheries regulation prohibiting the use of specifically designed fishing that targets on sharks. However, based on the Department of Fisheries Order No. 2/2004 dated 5 May 2004 on shark resources conservation, shark fishing operation in the protected areas starting from Ross Island (12° 13´ N, 98° 05.2´ E) to Lampi Island (10° 48´ N, 98° 16.1´ E) is prohibited, although sharks and rays are used sustainably by the country's tourism activities, especially in shark-watching dive tours (Nilar Htwe, 2013).

Philippines

According to the Checklist of Philippine Chondrichthyes (Compagno *et al.*, 2005), there are at least 163 species (3 chimaeras, 94 sharks and 66 batoids) found in Philippine waters, but the Philippine Bureau of Agricultural Statistics (BAS) lists the production of sharks in a single category, the same for rays. However, there are also other sources of data on sharks in the country such as National Statistics Office (trade data on by-products), Fisheries Regulatory and Quarantine Division (export-import data) of the Philippine Bureau of Fisheries and Aquatic Resources (BFAR), BFAR National Stock Assessment Program (specific landed catch data), BFAR Fisheries Observer's Program (on-board fishing vessels data), among others. The Philippines is also a signatory to CITES and based on its own Republic Act 8550 signed in 1998, which provides for "the development, management and conservation of the fisheries and aquatic resources", all species listed in CITES are automatically protected in the Philippines. Since the whale shark is listed as vulnerable in the IUCN Red List Criteria and Appendix II of the CITES, a Fisheries Administrative Order was enacted by the Department of Agriculture-BFAR (DA-BFAR FAO No. 143 series of 1998) to protect the whale sharks and manta rays, and ban the "taking or catching, selling, purchasing and possessing, transporting and exporting of whale sharks and manta rays". In 2009, NPOA-Sharks was adopted to ensure the conservation and management of sharks and their long-term sustainable use, and to provide as national guideline for managers and interested stakeholders to incorporate the issues concerning sharks and rays into the overall management of fisheries resources in the country. The country's overall efforts are still confronted with concerns on the need to improve scientific data collection platforms, conduct socio-economic studies, and address shark finning issues (Torres, 2013).

Thailand

As non-target species in Thai fisheries, sharks and rays comprise only a small proportion in the country's total catch of demersal fishes (less than 2% for sharks and 3-4% for rays), thus, the national fishery statistics lists all catch of shark and ray species only in one group. Based on the study of the Department of Fisheries (DOF) of Thailand in 2013, there are 63 species each of sharks and rays. The major challenge in the data collection on sharks and rays is the insufficient number of shark and ray specialists, while guidebooks and database system for shark resource management remains inadequate (Tassapon Krajangdara, 2013). Although the development of its NPOA-Sharks had been initiated in 2005, it is not yet completed. However, some elements of the said draft NPOA-Sharks had been implemented by the DOF, mainly on data collection on sharks and rays but the involvement of stakeholders remains inadequate. The DOF plans to conduct several activities in order to obtain endorsement of the NPOA-Sharks, such as data collection on rays in 2013-2014, capacity building of officials and other relevant officers, development of shark and ray identification sheets, publication of field guides for identification of sharks and rays, and information dissemination on sharks conservation that includes releasing of the bamboo sharks (*Chiloscyllium* spp.) and blacktip reef sharks (*Carcharhinus melanopterus*).

Vietnam

Shark fisheries in Vietnam are small-scale, while catch rate and catch composition of sharks are relatively low. There are no dedicated elasmobranches fishers, and almost elasmobranches are caught as by-catch. The high value of sharks leads to their high exploitation rate. Although shark fins are not much used for domestic consumption, these are exported to China. The constraints in data collection and assessment of stocks of sharks include inadequate research on shark biology, lack of standard format for data collection and analysis, lack of taxonomists in elasmobranches, and insufficient species information and catch composition. Studies on shark resources have not yet been comprehensively conducted in Vietnam. However, some information about the country's shark fisheries were sourced from results of some projects conducted in 2000-2005, *e.g.* Assessment of Living Marine Resources in Vietnam, Research of Stock Biomass and the Ability to Exploit Large Pelagic Fish in the Offshore Waters of Central and Southeast Vietnam. Results from such studies suggested that in the study areas, there are 38 species of sharks belonging to 23 genus. In 2005-2010, the data on sharks had not been regularly updated but the country is conducting a study on the Changes of Fisheries Resources in South Vietnam (2011-2015), which includes a compilation of additional information on species composition and distribution of shark species in Vietnam waters. In addition, the country's project on Building Database Systems to Investigate Biodiversity, Resources, Oceanography and Marine Fisheries (2011-2015) would also serve as basis for collecting national data on fisheries including information on sharks (Le Huu Tuan Anh, 2013).

to prepare the Southeast Asian countries of any eventuality. The Workshop also discussed the issues that should be considered by the countries, namely: (1) legality of the issues including relevant national laws, legal acquisitions, RFMOs, enforcements; (2) sustainability including NDFs, development of scientific evidence, introduction from the sea; and (3) traceability including permits, identification, reporting, and database development. In order to compile the initial information, the countries reported on the status of their respective efforts in sharks data collection (**Box 1**), offered their foresights on how to improve sharks data collection in order to carry out stocks assessment on sharks and rays, and identified the regional support needed from SEAFDEC and other organizations by the Member Countries once the listing shark species in the CITES Appendices should take place.

Recommendations and Way Forward to Improve Assessment of the Status of Stocks of Sharks/Rays

Based on the status reports provided by the countries on the utilization of sharks in their respective countries, it can be noted that sharks and rays are considered as incidental catch. In many cases, the available national statistics recorded sharks and rays by groups but not up to the species level except for Malaysia and Thailand, where pilot projects are being carried out to record data landings of sharks and rays at species level. The most common issues that confront the region include the inadequacy of experts and competent officers in elasmobranches taxonomy, insufficiency of knowledge and expertise to identify shark's parts and derivatives, and biological data, stock structure, and spatial and temporal distribution of sharks and rays which still remain lacking and inadequate. In order to improve the assessment of status of shark/ray stocks in the region, data collection on these species should be initiated as soon as possible. Since species identification may be difficult to undertake as part of routine data collection, the use of illustrations, group of species, should be promoted. Moreover, catch-and-release data should also be collected in the countries where sharks/rays fisheries are totally banned. A step-by-step approach is necessary starting with stakeholders' consultations to explain what to do and what to achieve in sharks data collection, and in estimating the abundance and biomass of sharks/rays using catch and effort data (CPUE).

As recommended during the October 2013 Regional Workshop, a standardized CPUE for specific type of fishing gears (trawl, gillnet, purse seine, longline, handline) would be developed, and sharks' landing data to be recorded using logbooks. The current data sheet used by enumerators in Malaysia could be used as guide for other countries. Furthermore, SEAFDEC/TD and the Marine Fishery Resources Development and Management Department (MFRDMD) have been encouraged to work closely with the Member Countries in order to come up with sets of pilot activities in sampling sites which could include areas in the Andaman Sea (Myanmar, Thailand, and Indonesia); Gulf of Thailand and South China Sea (Thailand, Malaysia, and Vietnam); and Sulu-Sulawesi Seas (Malaysia and Philippines).

The proposed pilot sites in the region are shown in **Fig. 2**, and as planned, data collection on three (3) species of hammerhead sharks (CITES Appendix II), thresher sharks (IOTC), and manta ray (CITES Appendix II) (**Fig. 3**) will be focused at these selected pilot sites. From the CITES Secretariat point of view, there are issues that

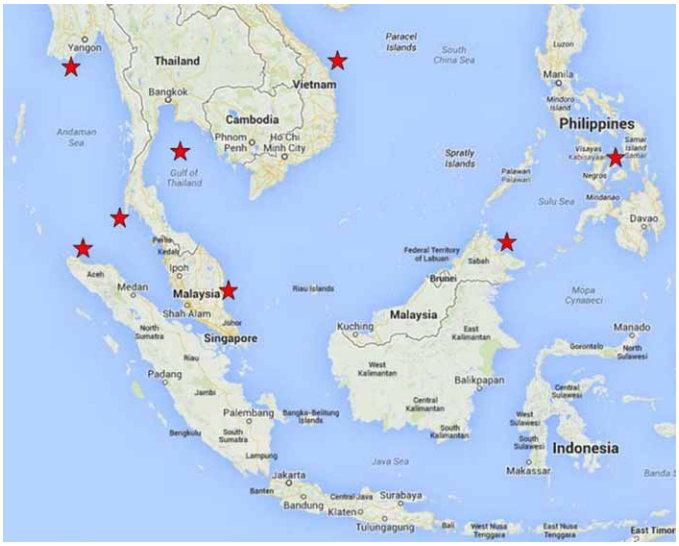

Fig. 2. Proposed project sites for the pilot activities on recording of CPUE on sharks and rays in Southeast Asia

Fig. 3. Selected species to be studied in the pilot activities

should be addressed in conducting regional and national capacity building, the detailed information of which could be gleaned from the country reports in **Box 2**. The issues include: (1) the need to enhance close cooperation between CITES-authorities and fisheries-related agencies in the countries; (2) development of work plans to focus on existing legal aspects (legal acquisition, national laws), sustainability (stock assessments, NDFs), and traceability (identification, reporting, database development); and (3) consideration of the national/regional needs.

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Box 2. Information on Several Countries' Responses to the Regulation Adopted during CoP16

European Union

After the CoP16, the European Union (EU) has committed to make available Euros 1.2 million to the CITES Secretariat to support the developing countries in the sustainable management and enhanced implementation of CITES regulations for commercially-exploited aquatic species. This financial assistance will be used to strengthen scientific, institutional and enforcement capacity. In this connection, the EU asked the wildlife trade monitoring network TRAFFIC to carry out a rapid assessment of the capacity building priorities and needs in developing countries. In June 2013, the EU Council of Ministers formally adopted a strengthened ban on shark finning and entirely banned the finning of sharks caught by EU vessels, and that sharks must be landed with their fins naturally attached. During discussions held in Bonn in July 2013, Germany announced that a study had been launched to develop guidelines and recommendations for CITES Parties on the conduct of non-detriment findings (NDFs) for porbeagle sharks and other shark species, and that an international workshop on NDFs for sharks is planned to be conducted in 2014 (Juan Carlos Vasquez, 2013).

India

According to the TRAFFIC report (Mundy-Taylor and Crook, 2013), India has the world's second-largest shark fisheries next to Indonesia. In August 2013, the Ministry of Environment and Forests issued a policy on 'fins naturally attached' which implies that sharks can be finned only at ports or harbors and not onboard fishing boats in the high seas. Violators of such law could face up to seven years in prison under the assumption that any detached fins brought onshore come from species protected under Schedule I of the Indian Wildlife (Protection) Act. This policy is considered the best and most cost-effective way of enforcing the finning ban while providing avenue for species identification and data collection, considering that identification of shark species solely from its fins has been very difficult (Graef, 2013).

Japan

In a press release by CITES on 14 September 2013, it was reported that Japan has entered reservations (Any Party/Member State of CITES may make a unilateral statement) that it will not be bound by the provisions of the Convention relating to trade of particular species listed in the Appendices (or in parts or derivatives of species listed in Appendix III) on all five shark species. This means that they will not be bound by CITES regulations when trading these species. However, Japan expressed its willingness to comply voluntarily with the Convention requirements for export permits and to provide technical support to prepare for the entry into effect of the sharks listing including of shark fin identification.

China

While opposing the inclusion of these shark species in the CITES Appendices at CoP16, China continues to have concerns regarding the implementation of measure in the spirit of international cooperation under CITES, but is with full respect for the decisions adopted at CoP16. As such, China will apply the CITES rules to the concerned shark species, and hence did not enter any reservations.

Malaysia

A review of the country's NPOA-Sharks (2006) is in the final stages through stakeholders' consultation to be completed in September 2013. The revised NPOA-Sharks would to be published before the end of 2013 (IOTC Secretariat, 2013). The amendment of the International Trade in Endangered Species Act 2008 (Act 686) included the five species of sharks and manta rays listed in Appendix II CITES to be listed in the Third Schedule of the Act. Amendment by the Ministry of Natural Resources and Environment (NRE) was completed in November 2013 and finalized by the Scientific Authority (SA) of the Department of Fisheries (DOF) Malaysia on Fish and Marine Life, and sent to NRE for final action. There are several other measures that DOF Malaysia is currently implementing and will continue to carry out in the future. These include: (1) conduct of non-detrimental findings (NDFs) study for sharks and rays listed in Appendix II of CITES; (2) preventing the international trade of saw fish (*Pristis microdon*); (3) listing of all products from the sharks and manta rays that are listed in Appendix I and Appendix II of CITES; (4) enhancing the catch records on sharks and stingrays listed in Appendix II of CITES; (5) enforcing the use of trader's records of stocks of sharks and rays listed in Appendix II of CITES; (6) maintaining and updating the records from processors of products of sharks and rays listed in Appendix II of CITES; (7) enforcing the regulation that all import and export of any specimen of sharks and rays listed under Appendix II of CITES must be with CITES permits; (8) implementing the procedures of the Introduction From the Sea (IFS) in the event of landing of specimens of sharks and rays listed under Appendix II of CITES, which have been caught in waters not under the sovereignty of any country (specimens caught in waters not under the jurisdiction of any state).

Thailand

Thailand with its Notification of the Ministry of Natural Resources and Environment issued on 27 June 2013 already included sharks and rays species adopted during the CITES-CoP16 into its regulations (Ministry of Natural Resources and Environment, 2013).

Vietnam

Circular No. 40/2013/TT-BNNPTNT issued on 5 September 2013 by the Ministry of Agriculture and Rural Development (MARD) listed shark and ray species in the CITES Appendix as protected species. Currently, there are no regulations banning the exploitation and trading of shark species in Vietnam due to lack of database on species composition and distribution. Research activities on marine resources are being conducted in Vietnam waters (2012-2015), the results of which could provide information for the development of database on shark and ray species. Based on such information, Vietnam will develop its NPOA-Sharks. Meanwhile, dissemination of the CITES regulations on the exploitation and trade of sharks and rays as well as capacity building for fisheries managers and researchers also will be the top priority in the near future (Le Huu Tuan Anh, 2013).

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