



REGIONAL WORKSHOP ON SHARK CONSERVATION AND MANAGEMENT IN THE NORTH  
INDIAN OCEAN

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Karachi, Pakistan 26-28 February 2019

Reducing Shark and Ray Mortality in the Arabian Sea

Funded by Shark Conservation Fund





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### **Executive summary**

The RSW-RPOA-1 workshop was held in Karachi, Pakistan, from 26-28 February 2019. A total of 40 participants from three governments, two inter-governmental organizations and six non-governmental organizations attended the workshop.

The following are a subset of the complete recommendations and outcomes from the RSW-RPOA-1 workshop to the Indian Ocean Tuna Commission for their consideration, which are provided from paragraph 156-170.

### **Summary of RECOMMENDATIONS of the Workshop:**

The Workshop **ACKNOWLEDGED** the need for a stronger regional cooperation and **ENCOURAGED** participants of the workshop to support and facilitate regional research projects. **RECOGNIZING** the geo-political differences in the NIO region, the Workshop **RECOMMENDED** that additional coordination mechanisms are identified/established to help improve management of highly migratory species, such as Sharks.

The Workshop **NOTED** that member countries in NIO are actively engaged in the catch or bycatch of sharks (with an exception to Maldives) which needs immediate attention, **ACKNOWLEDGING** the results of the bycatch mitigation in Pakistan, **RECOMMENDED** the replication of such initiatives, such as use of sub-surface gear, LED light sticks as bycatch mitigation measures in gillnet fisheries in the NIO to have wider coverage strengthening research on mitigation measures.

The Workshop **NOTED** the results of the LED light stick trials in Indonesia conducted by WWF-Indonesia and the Workshop participants **RECOMMENDED** the author to present his research at the 15<sup>th</sup> Session of the IOTC Working Party on Ecosystem and Bycatch.

The Workshop **ENCOURAGED** strengthening the evidence on mitigation measures discussed, and **RECOMMENDED** to engage member states of the IOTC through its working party meetings to establish support for mitigation measures for potential adoption through the introduction of a conservation and management measure for gillnet fisheries. The workshop noted that submission of such a joint proposal would require sponsorship from member states of the IOTC for submitting at the annual meeting in 2019-2020.

The Workshop **NOTED** the need for data analysis of bycatch and sharks and rays species composition data, and **RECOGNIZED** that the IOTC Secretariat had developed an Indian Ocean Shark Year Plan (IOSYP) which was endorsed by its scientific committee. The Workshop **RECOMMENDED** that WWF may propose to IOTC through sharing of the report that the programme is revised and that IOTC continues the IOSYP.

The Workshop **ENCOURAGED** the exploration of funding opportunities to support the development an institutional framework through a relevant regional organisation in the NIO region to further develop a regional plan of action for sharks

The Workshop **RECOMMENDED** to develop a consortium of like-minded NGOs, such as WWF, ISSF, Blue Resources Trust, WCS among others in the region to continue to support capacity building and pursue actions at national level with respective governments.

The Workshop participants discussed and **ENCOURAGED** governments that a ban on purchase and exports is put in place for species of special interest having a higher protection status. The Workshop

**RECOMMENDED** that the species of special interest are recognized and adopted by the IOTC member states.

Some participants discussed the challenge in defining large-scale vessels and **RECOMMENDED** that interested parties may develop a strong case on reclassification of vessels and submit to the relevant working party meeting of the IOTC.

The Workshop participants recognized the need for improving reporting requirements for Resolution 15/01 (on catch and effort data), 15/02 (On mandatory statistical requirements) for discards and of shark mortality, and **RECOMMENDED** that sharks are identified and reported to species/family level to the IOTC.

The Workshop participants acknowledged the efforts of WWF-Pakistan for its well-developed crew-based observer programme and **RECOMMENDED** that the crew-observers scheme is replicated, scaled and coupled with the use of electronic monitoring systems for improved data recording of target and non-target species.

**ACKNOWLEDGING** the need for stronger regional cooperation for the fulfillment of the identified objectives, the Workshop **RECOMMENDED** that mechanisms are identified/established to help implement the IOTC Regional Observer Scheme and undertake a feasibility of the alternative data collection systems so they can be verified by the scientific committee of the IOTC, in particular for small-scale fisheries. It was further noted that information may be provided at the latest to the Working Party on Data Collection and Statistics planned to be held in November 2019.

The workshop participants explored mechanisms for regional cooperation and exchange, it was **RECOMMENDED** that an intergovernmental platform would be suitable for moving forward of the implementation of the roadmap for RPOA sharks in NIO region. It was suggested that CMS sharks MoU could potentially serve as the platform to facilitate communication and decision making by governments.

The workshop was closed with thanks to all the organizers, participants, delegates and resource persons of the workshop. The workshop also thanked the facilitator.

The workshop report is adopted by all participating coastal states and participants. It was agreed that the workshop outcomes will also be shared with member countries which were not able to attend the workshop for their future consideration.

### Message from the CEO/Director General of WWF-Pakistan

Pakistan is one of the major shark fishing nations of the world, contributing to about 5% of the world's elasmobranch production and one of the top 30 shark fin exporters to Hong Kong in 2008. In the past six years, Pakistan has been exporting an average of 26 tons of shark fins to Hong Kong. This is quite alarming, considering that Arabian Sea shark and ray populations exhibited a declining trend. Based on a recent assessment by IUCN, at least 27% of the 222 different shark and ray species found in the Western Indian Ocean are considered threatened, meaning that they are classified as Vulnerable, Endangered or Critically Endangered. These species face a high risk of extinction and need urgent conservation attention and intervention.

There is growing concern on the lack of data available for sharks and rays, fisheries of Pakistan, without which informed decisions cannot be taken. WWF-Pakistan has been aiming to improve this situation in the past 5-years and are currently implementing several projects focusing on data collection from gillnet vessels which operate in the EEZ and as a bycatch sharks are also harvested. WWF-Pakistan has made success in collection of data which is now shared with Government of Pakistan and is being used for improved management of fisheries.

Pakistan is not the only country facing challenge in collection of information and data about sharks but other regional countries in of Western Indian Ocean such as Iran, India, Sri Lanka, the Maldives and United Arab Emirates are also dedicatedly working towards an improved management regime. While, we understand the political nexus in the Western Indian Ocean region, we strongly believe that science can pave a way for regional cooperation.

I sincerely hope, that this regional workshop on moving towards development of a Regional Plan of Action for Sharks would lay down a foundation as a roadmap for collectively moving towards meeting the common objectives. I wish all the workshop participants an enjoyable stay in Pakistan and a hope for a productive workshop achieving desired results.

On behalf of WWF-Pakistan, I had like to reiterate our commitment for conservation and improved management of sharks and rays in the Arabian Sea which will benefit other fisheries livelihoods, addresses food security and ecosystem health.



Hammad Naqi Khan  
Director General  
WWF-Pakistan

## ACRONYMS and ABBREVIATIONS

ABNJ	Areas Beyond National Jurisdiction
BRUV	Baited Remote Underwater Video Systems
BRT	Blue Resources Trust
BMIS	Bycatch Management Information System
BOBLME	Bay Of Bengal Large Marine Ecosystem
CAPs	Concerted Action Plans
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
CITES	The Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMMs	Conservation and Management Measures
CMS	Convention on the Conservation of Migratory Species of wild Animals
CPCs	Cooperating Non contracting Parties
CPPS	Permanent Commission for the South Pacific
CPUE	Catch Per Unit Effort
CSRP	Centre for Sustainable Research and Practice
eDNA	Environmental Deoxyribonucleic Acid
EEZ	Exclusive Economic Zone
EMS	Electronic Monitoring System
ETP	Endangered, Threatened and Protected
EUPOA	European Union Plan of Action for Sharks
FAO	Food and Agriculture Organization of the United Nations
FFA	Fisheries Forum Agency
GDP	Gross Domestic Product
GSRI	Global Sharks and Rays Initiative
GN	Gillnet
HL	Handline
HS	Harmonized System
IATTC	Inter-American Tropical Tuna Commission
ICCAT	International Commission for the Conservation of Atlantic Tunas
IFS	Introduction from the Sea
IPOA	International Plan of Action
IOSYP	Indian Ocean Shark Year Plan
IOTC	Indian Ocean Tuna Commission
IUU	Illegal Unreported and Unregulated
ISSF	International Seafood Sustainable Foundation
IUCN	International Union for Conservation of Nature and Natural Resources
JCU	James Cook University
Km	Kilometer
LAF	Legal Acquisition Finding
LED	Light Emitting Diode
LL	Long Lines
LoA	Length overall
m	Meter
MEAs	Multilateral Environment Agreements
MoU	Memorandum of Understanding
MPA	Marine Protected Area

MSC	Marine Stewardship Council
NDFs	Non-Detrimental Findings
NGO	Non-Governmental Organization
NIO	Northern Indian Ocean
NOAA	National Oceanic and Atmospheric Administration
NPOA	National Plan of Action
NWIO	North West Indian Ocean
OSPESCA	Organización del Sector Pesquero y Acuícola del Istmo Centroamericano
RAT	Rapid Assessment Tool
ROS	Regional Observer Scheme
RPOA	Regional Plan Of Action
RSCAPs	Regional Seas Convention and Actions Plans
SC	Scientific Committee
SRCF	Sub-Regional Fisheries Commission
SWOT	Strengths, weaknesses, opportunities, Threats
TAC	Total Allowable Catch
tRFMO	Tuna Regional Fisheries Management Organization
UAE	United Arab Emirates
UNCLOS	United Nations Convention on the Law of the Sea
UNEP	United Nations Environment Program
UNFSA	United Nations Fish Stock Agreement
USD	United States Dollars
WCPFC	Western and Central Pacific Fisheries Commission
WCS	Wildlife Conservation Society
WPDCS	Working Party on Data Collection and Statistics
WPEB	Working Party on Ecosystems and Bycatch
WWF	World Wide Fund for Nature

## Day One

### Opening of the Workshop (Inaugural Session)

1. The Sharks workshop was held in Karachi, Pakistan from 26-28 February 2019. A total of 47 participants (47 on the first day, 40 on the second day, and 44 on the third day) attended the workshop, including 16 International participants and resource persons. Representatives from the Maldives, Sri Lanka and Pakistan participated with resource persons attending from the Areas Beyond National Jurisdiction Tuna Project (ABNJ tuna project), Convention on Migratory Species (CMS), World Wide Fund for Nature (WWF), Blue Resources Trust (BRT), Elasmobranch Project – UAE, TRAFFIC and International Seafood Sustainability Foundation (ISSF). The list of participants is provided at [Appendix I](#).
2. The workshop was opened on 26 February 2019 with the recitation of verses from the Holy Quran, followed by a welcome of participants to Pakistan by Dr Babar Khan (WWF). The welcome note addressed the need for strong measures for shark conservation to be undertaken by governments, scientists, policy makers and resource practitioners to help move towards sustainable fisheries in the North West Indian Ocean region. It was expressed that there is also a greater need for developing measures which are practical and realistic for bycatch mitigation. In addition, recognizing the need on raising awareness for consumers and moving towards responsible consumption are key areas for consideration of participants to focus on during the workshop. A key note speech was provided by Moazzam Khan (WWF) on shark fisheries, a historical perspective, and provided an overview of the progress achieved on shark conservation in Pakistan.
3. The workshop was inaugurated by Mr Nawabzada Mohammad Taimur Talpur, Minister of Environment, Climate Change and Coastal Development – Sindh Province, Pakistan. During the inaugural session, Dr Shelley Clarke (FAO ABNJ Tuna Project), Claire van der Geest (ISSF) and Dr Andrew Cornish (WWF) expressed the need for continuous and dedicated support in conservation and implementation of measures for shark conservation, and to be mindful that shark populations are in global decline, and that political leadership is essential to encompass change on the ground to protect marine ecosystems.
4. The Minister expressed his dedication towards protecting the environment, providing commitments to lead the process and to provide the leadership for taking forward the outcomes of the workshop. Fisheries is a major source of revenue for the country and contributes to the national GDP, however, prioritized the need for conservation i.e. protection and sustainability of the marine resources to maintain human health, food security and secure livelihoods of hundreds and thousands of fishers around the coast of Pakistan.

### Agenda and arrangement for the Session

5. The agenda of the workshop is provided in [Appendix II. PowerPoint presentations were made during the course of the workshop by all resource persons.](#)
6. [The workshop was facilitated by the Indian Ocean Tuna Manager of WWF-Mozambique.](#)

### Purpose and Goals

7. The purpose of this consultative workshop was to facilitate communication amongst governments/coastal states in moving towards the development of a Regional Plan of Action for Sharks (ROPA Sharks). Moreover, the workshop aimed at identifying the challenges and existing gaps in the implementation of Conservation and Management Measures (CMMs) for sharks and rays in the Arabian Sea adopted by the Indian Ocean Tuna Commission. Moreover,

the workshop provided the opportunity to investigate the current bottlenecks in the development and implementation of NPOA Sharks in the region.

### **Specific Objectives/Outcome:**

The workshop aimed at:

- underlining the status of sharks and rays in the region as well as the impacts of ineffective governance, including how limited and poor fisheries management practices may be the result of multiple factors such as a lack of fisheries management capacity (human and financial), lack of prioritization in government policies, gaps in policy and legislation, political pressure and/or lack of political will and/or institutional transparency.
- exchanging knowledge and practices in the Arabian Sea and Indian Ocean on shark and ray management, including the availability of stock assessments for certain priority species, the status of the development of CITES Non-Detriment Findings (NDFs) and other best available science.
- communicating and reviewing existing information on bycatch mitigation measures and studies to ensure bycatch of sharks and rays does not threaten populations.
- exploring mechanisms for to improve data collection and reporting to tRFMOs of fisheries data on catch, discards, the post-release mortality of shark and ray species,
- (Identifying/reviewing) species specific, and/or fisheries specific, management measures that can be implemented at regional scales to prevent further overexploitation and/or mitigate interactions.
- exploring transboundary issues and discussing whether they are an impediment to shark and ray management in the NIO.

### **First Session: Setting the context for shark and ray management**

#### **Importance of Shark and Ray Management in the Global Perspective (Andy Cornish, WWF)**

8. Dr. Andy Cornish, Shark Leader, provided participants with an overview of significant global developments in efforts to conserve and sustainably utilise sharks and rays management globally. Many species of sharks and rays are facing serious population declines as a result of overfishing, but also and there has never been such great momentum to improve management. He introduced the Global Sharks and Rays Initiative global shark and ray management strategy which describes a theory of change, and identifies high priority countries, including some in the NIO.
9. The GSRI global conservation strategy has four-interlocking sub-strategies with objectives related to responsible consumption, responsible trade, sustainable fisheries and saving species. The overall goal of these strategies is to stop the further decline of shark populations, prevent extinctions and put in place measures to improve management by 2025.
10. While demand for shark fin remains a major driver for the overfishing of sharks, the international trade in shark meat has greatly increased over the past decade (Dent and Clarke 2015). Although demand for shark fin is declining in key markets such as Hong Kong and Singapore, it appears that in some major catching nations, demand for shark meat would provide sufficient economic motivation to continue to catch sharks even if there was no market for the fins.
11. The presenter described that a fundamental issue for shark and ray management remains a lack of data on species composition caught, landed and traded across borders, which impedes informed decision making.

12. The presenter described that at least 20 commercially important shark and ray species have been listed in CITES appendix II since 2013. However, a blanket ban on exports, which is one option for nations catching these species to comply with CITES, will not ensure that CITES contributes to sustainable use unless fisheries management also improves. There is a need for a greater focus on recovery plans for species of concern / depleted populations.
13. One of the biggest challenges to ensure change for shark and ray management is the reluctance to set science-based fishing limits. In addition, the problem precedes management, as the management regime often works in a reactive manner and shark populations are being consistently depleted faster than science or management can react and alter downward population trajectories. Case studies from few countries were cited, in particular the once common Oceanic white tip shark (*Carcharhinus longimanus*), with very few areas remaining where people can interact underwater with them.
14. The workshop participants noted the issues surrounding the take of sharks and rays in multi-species/multi-gear fisheries – a complex problem which does not have a common solution. In such areas, and where catch quotas may not be feasible, a dual approach of spatial protection for critical habitats, and bycatch mitigation holds promise for reducing mortality. There are guides and relevant materials developed for providing advice to interested parties, which were presented at the workshop.
15. The presenter presented the work around bycatch mitigation and the trials underway in Pakistan and Indonesia, and that results coming out of the trials are promising and encouraged workshop participants to help set-up trials in their regions.
16. The participants of the workshop were informed that WWF has a global programme and has shark and ray management focused projects in more than 10 countries, including in the Indian, Pacific and Atlantic Oceans.
17. The workshop participants discussed challenges for shark and ray management in detail, in particular bycatch mitigation measures, and that mitigation options and upscaling trials of promising approaches has merit. It was discussed that the workshop participants may collectively explore opportunities to support the scaling up of trials in other areas, for instance, Sri Lanka, India and Iran.

#### Shark Conservation RFMO, bycatch and CMMs (Claire van der Geest, ISSF)

18. Ms. Claire, Policy Consultant to the ISSF, noted the clear mechanisms identified under the United Convention on the Law of the Sea and the UN Fish Stock Agreement and the consistency with the Indian Ocean Tuna Commission regarding conservation of marine resources which include resolution 12/01 on precautionary approach, adoption of Resolutions for conservation and to mitigate the impact of tuna fishing on associated and dependent species (ecosystem based fisheries management), adoption of resolution apply throughout the agreement area (high seas and EEZ).
19. The presenter highlighted the four CMMs adopted by the IOTC members for shark species:
  - Resolution 12/09 on the conservation of thresher sharks (*Alopiidae spp.*) caught in association with fisheries in the IOTC area of competence
  - Resolution 13/06 on a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries
  - Resolution 13/05 on the conservation of whale sharks (*Rhincodon typus*),
  - Resolution 17/05 on the conservation of sharks caught in association with fisheries managed by IOTC.

20. The Presenter also noted other CMMs have been adopted by the IOTC members for other bycatch species, such as sea turtles, sea birds and cetaceans however, that there was currently no CMM adopted for ray species.
21. The Workshop participants briefly discussed the minimum data requirements and the need for retention, discard and reporting data on the bycatch of each species.
22. The multilateral and other regulatory systems or processes in place including Conservation of Migratory Species (CMS), CITES and MSC certification schemes which help improve fisheries with a vested focus on markets were also discussed in the workshop.
23. The Presenter also mentioned the other regional fisheries management organizations working on tuna conservation and management including CCSBT, IATTC, ICCAT, WCPFC and also described the number of CMMs adopted for bycatch for sharks.
  - i) CCSBT – uses measures from other RFMOs as its convention is specific for SBT management
  - ii) IATTC – CMMs for bycatch including for sharks for mobulids rays, turtles, seabirds plus consolidated bycatch CMM
  - iii) ICCAT – 9 CMMs for bycatch including for sharks (by species), turtles, sea birds
  - iv) WCPFC – 9 CMMS for bycatch including for sharks (by species), whale sharks, cetaceans, turtles and sea birds
24. The progress among different RFMOs on the measures adopted and the consideration of the measures that are consistent across the fisheries were discussed. It also highly likely that in some cases these measures become redundant, as species or fisheries specific measures are required.
25. The Presenter made specific notes regarding the dynamic nature and socio-economic diversity of the Indian Ocean when compared to other Oceans. For example, the presenter noted that more than 50 per cent of tuna caught by smaller industrial and artisanal fishing fleets. In addition to the catch of more than 50 per cent of the tuna caught within the EEZ of coastal states in the Indian Ocean. The region has a very high number of small scale industrial and artisanal fishing vessels which use highly non-selective fishing gear, such as the gillnets/driftnets which are longer than 2.5 km.
26. The workshop recognized the need for action, review of the scientific literature, and collaboration with others to understand what mitigation methods work, and conduct more research in the area.
27. The Workshop participants discussed that shark fins in Pakistan and Sri Lanka are landed with their fins attached, however for certain species, such as thresher sharks, no-retention measures have been adopted and no encirclement is allowed around whale sharks.
28. It was also described that all the bycatch measures are irrespective of the size of the vessel and all conservation measures applies to both EEZ and high seas targeting tuna and tuna like species.
29. It was noted that any State can take unilateral management and conservation actions for its own EEZ that are more stringent than those adopted by an RFMO and/or on the high seas. There was also acknowledgement that these measures could then be brought to an RFMO for adoption on the high seas.
30. The Workshop participants discussed a ban on purchase and exports of species of special interest and having a higher protection status.
31. Some participants discussed the challenge in reporting requirements to IOTC and considered the need for revision or reclassification of large-scale vessels. It was proposed that this challenge may be highlighted to the IOTC secretariat based on the fact that the IOTC resolutions are binding on vessels which are 24 m and above, or to vessels which are 24 m below but fish

outside the EEZ. It was discussed that there is a need to explore reporting obligations and requirements for vessels which are less than 24 m and fish exclusively inside the EEZ.

32. Moreover, some participants also showed concerns that there are 20-24 m vessels which are fully mechanized and that IOTC may be suggested to consider reclassifying large-scale vessels to 20 m and above (LoA).

#### NPOA and RPOA development for the Indian Ocean (Shelley Clarke, FAO ABNJ Tuna Project)

33. Dr Shelley Clarke, Technical Coordinator for Sharks and Bycatch – Common Oceans (ABNJ) Tuna Project, described the FAO Code of Conduct for responsible fisheries and noted that the International Plan of Action (IPOA)-Shark is a voluntary agreement deriving from the Code of Conduct and underpins the management of sharks and rays through the development of National Plans of Action (NPOAs).
34. It was noted that, despite the positive progress on shark data collection, and a greater recognition of the importance and significance of sharks, NPOA development has not been a priority for some countries. FAO maintains a database of measures for sharks that have been adopted and implemented by coastal/member states. The IPOA was adopted in 1999, with slow progress during the early 2000s, and more rapid progress since 2005. In some cases, the status of NPOAs is not clear because various countries' NPOAs remain in draft, are not publicly released and/or may have expired.
35. Progress on the development of Regional Plan of Action-Shark (RPOAs) was also discussed. To date at least six are known to have been developed in the following regions:
  - West Africa (CSRP / SRCF – Sub-regional Commission on Fisheries)
  - Pacific Islands (FFA)<sup>1</sup>
  - Mediterranean (UNEP/IUCN)
  - Southeast Pacific (CPPS)
  - Central America (OSPESCA)
  - European Union (EUPOA)
36. It was discussed that sometimes countries or areas covered by RPOAs for sharks do not have a NPOA for sharks at the national level. There is no specific guidance for RPOAs. All of the existing RPOAs have been led by an established regional body.
37. The presenter encouraged participants to make use of the FAO Database of measures on conservation and management of sharks at <http://www.fao.org/ipoa-sharks/database-of-measures/en/>
38. The Workshop participants inquired whether the implementation of NPOAs and RPOAs has been effective in improving the status of shark populations in the region. Dr Clarke noted that Fischer et al<sup>2</sup>. reported in a 2012 FAO review of the implementation of the IPOA suggested that further work needs to be done to address remaining challenges. She also mentioned that with the long reproductive cycles of sharks it would be expected that a considerable number of years may be required before stock status improves.
39. The Workshop participants noted that the Maldives is a shark sanctuary and the adopted NPOA of the Maldives and the shark sanctuary go hand-in-hand in improved management in the area.

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<sup>1</sup> [https://www.ffa.int/system/files/Pacific%20Islands%20RPOA%20Sharks%20Final%20Report%20\\_3\\_.pdf](https://www.ffa.int/system/files/Pacific%20Islands%20RPOA%20Sharks%20Final%20Report%20_3_.pdf)

<sup>2</sup> FISCHER, J., ERIKSTEIN, K., D'OFFAY, B., GUGGISBERG, S., & BARONE, M. (2012). *Review of the Implementation of the International Plan of Action for the Conservation and Management of Sharks*. <http://site.ebrary.com/id/10815940>.

CMS and CMS Shark MoU (Andrea Pauly, CMS)

40. Andrea Pauly (UNEP/CMS) presented the different instruments and legal requirements under CMS and political commitments under the specialized Memorandum of Understanding on the Conservation of migratory Sharks (Sharks MOU) that was established under the umbrella of the Convention to the workshop
41. The CMS is a treaty under the UN environment programme which came in force in 1983 and has 127 Parties. The overall goal of CMS is to conserve migratory species throughout their entire range and along their migratory routes. The Convention acts as framework Convention and has established regional agreements under its umbrella, some of which are legally binding and others like the Sharks MOU which are not legally binding.
42. The presenter pointed out that CMS is a conservation treaty and that its mandate was not to manage fisheries. However, the presenter explained that CMS Parties as well as the Signatories to the CMS Sharks MOU have agreed to work with and through competent bodies, such as fisheries management organizations and the FAO to support improving fisheries management.

*Convention on the Conservation of Migratory Species of Wild Animals*

43. The workshop was made familiar with some of the key definitions included in Article I of the Convention (<https://www.cms.int/en/convention-text>). It was explained that a Range State under the Convention includes state, flag vessels of which are operating in foreign waters and in areas beyond national jurisdiction.
44. The participants were informed about the species Appendices of CMS.
  - a) Appendix I lists endangered species, which are strictly protected and for which Parties shall prohibit any form of taking. All species of sawfish and mobulids as well as the whale shark, white shark, basking shark, angel shark and the Mediterranean population of the common guitarfish are included in CMS Appendix I.
  - b) Appendix II lists migratory species which have an unfavourable conservation status and which require international agreements for their conservation and management, as well as those which have a conservation status which would significantly benefit from the international cooperation that could be achieved by an international agreement.

45. The presenter mentioned that CMS has developed Concerted Action Plans (CAPs) including for whale sharks geared towards research and monitoring, unified tourism guidelines, increase on-board observer coverage, engaging non-CMS range states, legislation, policy and management, and addressing external threats.
46. The presenter also described the CAP on Mobulids Rays based on implementing global conservation strategy for mobulids rays, drive collaborative and community-based conservation and management, reduce target and incidental catch, and monitor, evaluate and adapt conservation and management measures.

*Memorandum of Understanding on the Conservation of Migratory Sharks (Sharks MOU)*

47. The Sharks MOU was developed under the umbrella of the Convention as specialized agreement for chondrichthyan species in accordance with Article IV (4) of the Convention. The global instrument counts 48 Signatories and lists 37 species of shark and rays in its Annex 1. Its aim is to achieve and maintain a favourable conservation status for migratory sharks and rays, taking into account the economic needs of Signatories.
48. Signatories to the Sharks MOU have agreed five main objectives on which the Conservation Plan in Annex 3 of the MOU is based:

- i) Research: Improving understanding of migratory shark population through research monitoring and information exchange
  - ii) Sustainable Fisheries: To ensure that directed and non-directed fisheries for sharks are sustainable and also cooperate through RFMOs, the FAO, RSCAPs, and biodiversity related MEAs as appropriate;
  - iii) Habitat Conservation: Ensuring to the extent practicable the protection of critical habitats and migratory corridors in critical life-stages of sharks;
  - iv) Awareness Raising: Increasing public awareness, of threats to Sharks, and their habitats, and enhance public participation in conservation activities
  - v) International and Regional Cooperation: Enhancing national, regional and International cooperation
49. The list of species that are covered by the different instruments under CMS is available (<https://www.cms.int/sharks/en/species>) Ms. Pauly explained the benefits of Signatories to the MOU, which include support with capacity-building, access to scientific advice, access to research and funding opportunities, network of cooperating partners.

#### Shark and Ray Management in CITES perspective (Daniel Fernando, Blue Resources Trust)

50. The presenter detailed the presentation on CITES and how it related to shark and ray management nationally, regionally and globally. The focus of CITES is to regulate international trade for Appendix II listed shark species to have improved management. The trade is permitted as long as it is not detrimental to the species sustainability or survival.
51. The presenter mentioned that in 2013 seven species, including three species hammerhead, Oceanic white tip (*Carcharhinus longimanus*), Porbeagle (*Lamna nasus*) and Manta rays (*Manta birostris*) were included in Appendix II of the CITES.
52. It was mentioned that Blue Resources Trust, in cooperation with other international and regional NGOs, have conducted trainings and capacity building workshops to raise awareness on CITES and management of listed species.
53. In 2016, thirteen species, including silky sharks (*Carcharhinus falciformis*), thresher sharks (*Alopias spp.*) and mobula rays (9 spp.) were listed on Appendix II of CITES. Implementation progress since those listings was showcased by the presenter.
54. Furthermore, it was noted that in 2019, three more species groups; the wedge fish (comprising 10 species and supported by 62 proponents), mako sharks (2 species and supported by 55 proponents) and giant guitarfishes (6 species and supported by 54 proponents) have been proposed to be listed on Appendix II of CITES. The Workshop participants noted the unprecedented support received for the listing proposals of the shark species is an evidence of the urgency and the immediate need of adopting robust conservation management measures.
55. The presenter explained the CITES trade process and requirements. An export permit can be provided from a management authority at the national level. Moreover, the workshop participants noted that before the management authority issues a permit, a legal acquisition finding (LAF), and a non-detrimental finding (NDF) has to be undertaken. The presenter further explained that the LAF helps ensure that the management authority of the state of export is satisfied that the specimen was not obtained in contravention of the laws of that state for the protection of fauna and flora. In addition, the NDFs help ensure that a scientific authority of the state of export has advised that such export will not be detrimental to the survival of that species.
56. The presenter described that an NDF shall be required when a specimen, or part of specimen is traded across an international border. It was reminded to the workshop participants that if member states are interested in trading appendix II listed shark species across borders, they have to undertake NDFs.

57. The workshop participants further noted circumstances under which shark and ray species listed under CITES Appendix II are caught in the high seas and brought to a party, they shall require an IFS (introduction from the sea) certificate. An IFS certificate requires an NDF. Further, it was presented to the participants, the many situations that require undertaking an NDF, i.e. in situations when foreign vessels are fishing within an EEZ, or a foreign vessel fishing in the high seas and landing its catch in a country, even if a catch is re-exported, an NDF is required on the re-export permit.
58. The presented mentioned that before any listed species of CITES is destined to be exported, or introduced from the sea, has been fished or landed, an NDF should be undertaken as it may have several conditions, such as total allowable catch (TAC), export quantities, or requirements of monitoring, and control systems to ensure compliance.
59. The Workshop participants discussed the significance of undertaking NDFs and how it is relevant to participating countries. Moreover, apart from understanding the need to have NDFs in place, there was also discussions that suggested to explore having a similar exercise for appendix III listed species.
60. It was also mentioned that the Indian Ocean Tuna Commission has undertaken stock assessments for blue sharks in recent years. Stock assessments for Oceanic white tip (*Carcharhinus longimanus*), Shortfin mako (*Isurus oxyrinchus*) and Silky sharks (*Carcharhinus falciformis*) have been prioritized in the near future. Further, the IOTC has undertaken an in-depth review – a data mining exercise for hammerhead sharks in 2016, however, the exercise remained data deficient.

#### **Country Presentations (Maldives, Sri Lanka and Pakistan)**

61. The Workshop Participants noted the country presentations made by the Maldives, Sri Lanka and Pakistan. The workshop participants also noted the contributions from Wildlife Conservation Society who provided a brief on the NPOA for sharks in Bangladesh, in addition to the sharing of NPOA for Sharks in India by Mr Yadava Yugraj Singh, although these documents were not read or presented at the workshop, a summary of the update from Bangladesh (provided by WCS) and India is being added in to the report for future references, and work to be undertaken in the region.

#### **Status of National Plan of Action for Sharks and its implementation in the Maldives (Khadija Ali, Maldives)**

62. The representative from the Government of the Maldives provided a presentation on the country report. The abstract of the presentation is as follows; *“The Maldives is an archipelago comprising of 1,190 islands with a widespread EEZ. The Maldives has had a catch retention ban on sharks and rays since 2010. However, historically, sharks were targeted with different gear types in demersal, coral reef and offshore areas. In the Maldives, around 40 species have been recorded, coastal, offshore and Deepwater/demersal. National legislation has been put in place for improved shark and ray management, in addition to also having a CITES scientific authority and management unit placed in the government of the Maldives. The national plan of action for sharks was endorsed in 2015 and has been put in place ever since, a few of the challenges and knowledge gaps were also shared”*.
63. The presenter described that the wide-spread out area of the Maldives EEZ which poses a challenge for management. The area covers about 923,332 sq. km.
64. The presenter expressed that the mainly caught sharks in the Maldivian waters include the silky sharks (*Carcharhinus falciformis*), oceanic white tips (*Carcharhinus longimanus*), spot-tail (*Diplodus holbrookii*) and silvertip sharks (*Carcharhinus albimarginatus*).

65. It was mentioned by the presenter that there are no interactions of sharks with the pole and line fishery of the Maldives, however, Maldives also has a distinct handline and longline fishery. There are no interactions reported or recorded in the handline fisheries, however, in longline fisheries, certain shark species are caught, but none are retained on board.
66. The interactions of sharks in longline fishery in the Maldives in 2016 and 2017 were discussed, further noting that the majority of the sharks caught in longline gear are released without any damage, with only a fraction of mortality reported.
67. It was presented that there are national legislations in place that protects sharks, in addition to adoption and implementation of measures from multilateral agreements, such as IOTC, CITES among others.
68. The presenter also mentioned the challenges faced by the Maldives, which included the difficulty in determining the status of shark populations, considering that the data available is from citizen-science based programmes which are voluntary in nature and restricted to funding, in addition to undertaking regular research on habitats.
69. It was presented that there is a need for Maldives to undertake depredation studies, undertake baseline on shark population and abundance considering that fishermen have been complaining on the increase of reef shark populations.
70. The Workshop participants encouraged the Maldives to undertake BRUVs, use of electronic monitoring systems and scale up crew-based observers or citizen science approaches to maximize efforts, while engaging robustly the resorts and the marine biologists.

#### Shark Fishery in Sri Lanka (Sandamali Herath, Sri Lanka)

71. The representative from the Government of Sri Lanka provided a presentation on the country report. The abstract of the presentation is as follows: *“Sri Lanka has a coastline of around 1,730 km and its fisheries sector play a key role in shaping up the socio-economic profile of the country. Around 45,000 fishing vessels are registered in Sri Lanka in different categories with around 456,990 tonnes of marine fish caught in 2016. Sri Lanka used to have a dedicated shark fishery in the past, however, at present, sharks are caught as bycatch. The data on total non-directed catch of sharks, including the species composition data was provided by the authors. An overview of shark management with respect to national legislation, and challenges related to its implementation were shared with the workshop participants”.*
72. The presenter mentioned that Sri Lanka has developed its national plan of action for sharks in 2012, and is currently in revising it and developing its second one.
73. It was presented that gillnets remain the most dominant gear type responsible for shark and ray bycatch (51.6 per cent) from 2014-2017 in the EEZ and the high seas.
74. The Workshop participants noted that around 3,187 tonnes of sharks were caught in longline operations from 2014-2017 with little or no survival.
75. It was presented that around 55 per cent of the sharks caught in fishing operations were not able to be identified, in addition, around 32 per cent of the sharks caught were identified to be as silky sharks. Moreover, around 25 per cent of the bycatch recorded from 2014-2017 comprised of devil rays.
76. It was discussed that there is a need for recording shark and ray species up to species level, and Recommended that identification guides and trainings on shark and ray identification be undertaken by NGOs, such as WWF, PEW, ISSF, WCS, Blue Resources Trust, among others.

#### Shark Fisheries in Pakistan (M. Farhan Khan, Pakistan)

77. The representatives from the Government of Pakistan provided a presentation on the country's report. The abstract of the presentation is as follows: *"Pakistan has a coastline of 1,050 Km, comprises of two Maritime Provinces (Sindh and Balochistan), and is connected to India, Iran, Sri Lanka and Maldives by the Arabian Sea. Pakistan is rich in shark and ray fauna and around 134 species of elasmobranchs have been recorded. Pakistan used to have a targeted shark fishery mainly caught for salted and dried product destined for Sri Lanka markets. Currently, sharks are caught as bycatch in tuna gillnet fisheries. There are about 16,000 fishing boats operating in Pakistan, with around 700 tuna gillnet vessels. It is estimated that around 55 per cent of the total shark landings originate from gillnet vessels. Due to continuous harvest of sharks, its landings have drastically decreased from 1999-2007 i.e. from an annual average catch of 50,000 tonnes to around 15,000 tonnes in just 10 years"*.
78. It was presented that Pakistan does not have a NPOA adopted, and acknowledged WWF-Pakistan for its collective effort to formulate the NPOA for sharks, which also includes rays.
79. The historical perspective of shark fishery in Pakistan was also presented and that sharks and rays are facing a huge decline. Further, that Short-fin mako (*Isurus oxyrinchus*) are the most dominantly caught shark species, after Thresher (*Alopias spp.*) and Silky sharks (*Carcharhinus falciformis*).
80. The presenter described that sharks are usually caught as bycatch in tuna gillnet fisheries, they are landed with their fins attached, nothing goes to waste, as the fins are exported to south-east Asia, whereas, the meat and the remaining parts of the carcass are used domestically.
81. It was presented that both maritime provinces of Pakistan have put in place a ban for catch, retention and landing of CITES and IOTC listed shark species, however, the implementation or enforcement of the law is weak or poor.
82. The presenter also discussed that shark fisheries play an important role in the socio-economics of the country and in particular in supporting the livelihoods of the fishers.

#### Current Status of Sharks and Rays and updating a NPOA for their Conservation in Bangladesh (WCS)

83. The workshop participants acknowledged the contributions from WCS in Bangladesh for providing a brief update via skype on the NPOA development, recognizing that Bangladesh was not able to make the workshop. The workshop participants noted the progress made by the Government of Bangladesh and the significance and importance of declaring MPAs, closed areas i.e. spatial management as a tool for improving the conservation and management of sharks in the Bay of Bengal area. A brief was provided by WCS.

#### National Plan of Action for Sharks and Ray in India (Yadava Yugraj Sindh, India)

84. Even though the representative from India wasn't able to make it to the workshop, the participants still acknowledged the efforts of Mr Yadava Yugraj Singh and the update on the NPOA for sharks in India. It was discussed that the shark NPOA in India is now in final draft form and pending approval from relevant authorities. It was expressed that India is the second largest shark catcher in the world and that the management regime is essential. He also mentioned that a regional plan of action for sharks in the Bay of Bengal Large Marine Ecosystem (BOBLME) was developed, however, due to certain reasons was discontinued and the focus has been on developing and implementing the NPOA for sharks.

## Shark Assessment Report – Pakistan (M. Moazzam Khan, WWF)

85. The presentation on the shark assessment report presented by the author, M. Moazzam Khan provided the historical context of shark fisheries in Pakistan. It was mentioned that the shark fisheries in Pakistan declined drastically in the late 90s. The major market of sharks was in Sri Lanka which existed primarily for the salted dried products. However, with the advancement and mechanism of the vessels in Pakistan and having on board freezing facilitating, the shark products found a niche for its value in the domestic markets.
86. The presenter mentioned the decline in elasmobranchs from 1999-2011, although data issues regarding the reliability exists, the overview of the shark decline is very distinct and obvious.
87. The presenter described that there is no data or record from Pakistan on the exports of shark fins since 2002. The main reason being that shark fins are recorded under a different HS code which is used for frozen products. This has been verified through other sources, as such, the trade data received from Hong Kong indicates that Pakistan has been exporting an average of 26,000 Kg of shark fins from 2012-2017.
88. The presenter explained the changes in the trophic levels through the catch history, which basically included the increase in Indian mackerel landings during the period shark landings have reported to have declined. It was speculated that this could have been due to a trophic cascade scenario, however, it might be attributed to the impacts of climate change. The Workshop participants noted and acknowledged the need for further research and investigation on this matter.
89. It was mentioned that sharks are not protected in Pakistan, even species, such as sawfishes do not have the level of protection it required due to its global decline. In addition, it was also noted that certain species of sharks, such as, Indian sand tiger (*Carcharias tricuspidatus*), Sand tiger shark (*Carcharias Taurus*) and Pondicherry shark (*Carcharhinus hemiodon*) is very limited and it is speculated that they might be extinct from Pakistan.
90. It was mentioned that WWF-Pakistan is working in close collaboration with fisheries departments, and has facilitated in promulgation of legislation at the provincial level, for improved protection of sharks, mobulids, guitarfishes and other endangered, threatened and protected species.
91. The Workshop participants noted the efforts made by WWF-Pakistan on raising awareness and the declaration of MPAs in Pakistan, in addition to educating and engaging the fishers through the ABNJ tuna project activities.
92. The workshop participants acknowledged the work undertaken by WWF-Pakistan using the citizen-science based approach for bycatch mitigation and release in the tuna gillnet/driftnet fisheries. The workshop participants noted that since 2012, WWF-Pakistani trained fishers have released 98 whale sharks, 76 mobulids, 9 rays among other marine megafauna which includes sea turtles and cetaceans.
93. The Workshop participants also noted the mitigation options being trialed in tuna gillnet fisheries, which include the use of LED lights and sub-surface gears which looks promising as it shows initial success. The participants of the workshop were appraised by WWF-Pakistan that they are currently disaggregating data and will be able to share detailed analysis in upcoming IOTC meetings.
94. The workshop participants noted that the Shark assessment report does not exist at the moment, noting the contents of the report in development, encouraged the Pakistan government to expedite the process.

## Day Two

### Recapturing thoughts from Day One – (Facilitator)

95. A brief recap on the day one outcomes were deliberated to the workshop participants, indicating the highlights of the first day presentations made. A reflection on the commonalities and some the challenges coastal states face in the management of sharks and rays were identified. It was further discussed that the day one was successful establishing an equal level of playing field among the participants, in order to understand the key levers, policy, multilateral agreements which basically provide tools for helping develop the national plan of action or such tools may be used for developing a road map for regional plan of actions for sharks.
96. The workshop participants noted the changes in the agenda for day two. The changes in the agenda were based on the debriefing of the resource persons and the revised agenda for day two was shared with the participants.

### Conservation of sharks and rays in the Arabian Sea and adjacent waters (Dr. Rima Jabado, Elasma Project)

97. The regional IUCN Red List of Threatened Species assessment conducted in 2017 focusing on the Arabian Sea, Red Sea, Arabian/Persian Gulf and the Gulf of Oman was presented. The presenter mentioned that around 72,000 MT of shark catch was reported from these regions which makes up 9.6 per cent of total global reported catches, and of the 20 countries bordering this region, seven countries do not report their catches from the region.
98. The presenter explained the decrease in abundance, diversity and species richness owed due to the unprecedented coastal development and fisheries pressure, further recognizing that there is overall lack of fisheries management and clear evidences of population declines for many species. The region was highlighted as having some of the most threatened populations of sharks and rays in the world with over 50% of species assessed as Critically Endangered, Endangered and Vulnerable.
99. The presenter also mentioned that the Red List workshop highlighted or identified the species status based on the IUCN red list categories and criteria (v. 3.1) and regional guidelines for application of IUCN Red list criteria. The workshop was successful in identifying threatened categories by looking at the reduction of species over a certain period of time, species that are threatened regionally, but not globally, and species that show stable populations and diversity in the Arabian Sea and adjacent waters.
100. It was presented that the most diverse areas of sharks were also the most highly exploited areas and had the highest fishing effort concentrated. Further noting that, skates and torpedo rays have no economic interest in some countries and hence, even if caught are discarded at sea and not landed. Around 19% of the species assessed were found to be Data Deficient, 12.4% species were considered Least Concern.
101. The presenter mentioned that the most threatened families including sawfishes (Pristidae), guitarfishes, wedge fishes (Rhinobatidae) and eagle rays (Myliobatidae), in addition to hammerhead sharks (Sphyrnidae) that are found to have populations that are rapidly decreasing.
102. The Workshop participants noted the recommendations of the workshop as they focused on improved governance, regional research and collaboration among the countries in the Arabian Sea and adjacent waters.

### Panel discussion on bycatch mitigation options and available resources in NIO

103. The Workshop participants noted the panel discussion which focused on bycatch mitigation options and the trials being undertaken in Indonesia and Pakistan, in addition to understanding how Bycatch Management Information System (BMIS) can prove helpful for countries in the NIO for information sharing, knowledge management and implementing the best management practices.

### Bycatch mitigation through the use of LED lights and Electro-shields in Gillnet (GN) and use of circle hooks in Longline (LL) fisheries in Indonesia (Ariyogatama, WWF)

104. The presenter presented the dynamic nature of the fisheries in Indonesia, in addition to the challenges associated with LL and GN fisheries. The problem was presented as high bycatch of sharks – and that led to WWF exploring options to mitigate – looking at fishing locations, fishing gear, and also looking at best practices for handling sharks in LL, HL, and GN fisheries.
105. It was presented that sharks are consumed in domestic/national markets and the examples of LED lights in GN and the use of circle hooks in LL fisheries were shared. The data has been collected from the trials and analysis has been undertaken with support from NOAA.
106. The Workshop participants acknowledged WWF on the successful trials undertaken and the encouraging results of the trials. Further noting the green LED lights successfully reduced entanglements of cetaceans by 91%, 84.5% decrease in seabird bycatch, 61.4% decrease in sea turtle bycatch and around 59% decrease in hammerhead sharks.
107. The results of the use of the electro-shields and circle hooks were also presented in the workshop and they seem to provide some success. It was discussed that circle hooks are appropriate and also do not compromise target catch.

### LED Trials in Pakistan in gillnet (monofilament) fisheries (Shoaib Abdul Razzaque, WWF)

108. The preliminary results of the LED trials in Pakistan, focusing on the aggregated areas for short-fin mako (*Isurus oxyrinchus*) in the Indus delta were presented in the workshop.
109. The citizen science based approach was noted by the workshop participants as a means of undertaking trials for LEDs – and the results showcase that the non-LED (control vessel) has had more shark catches than the trial vessels IOTC Secretariat informed participants that the 21st session of the Scientific Committee endorsed all the recommendation from the WPDCS as well as its program of work, noting that ROS specific activities are now outlined and sources of funding are being identified.

### Bycatch Management Information System (Shelley Clarke, FAO ABNJ Tuna Project)

110. The presenter described the online BMIS platform ([www.bmis-catch.org](http://www.bmis-catch.org)) was developed by WCPFC in 2010 for mitigation techniques, later re-designed under the ABNJ Tuna Project to expand and globalize its scope, further noting that it was re-launched in 2017 with a new interface and content.
111. The presenter noted that the online platform provides resources and access to bycatch handling, mitigation and research guidelines and papers available and encouraged the workshop participants to make best use of the online platform.
112. The presenter noted that BMIS will be updated soon with more information, such as updates on shark tagging database, summaries of public domain observer data for some t-RFMOS, interactive maps and infographics, and expanded reference collections on assessment and management.

#### The use of sub-surface gears as a mitigation option in Tuna gillnet fisheries (Umair Shahid, WWF)

113. The presenter noted that the sub-surface gillnet settings used in the Pakistani EEZ have same CPUE as surface gillnet settings used in the same area but lower bycatch of sea turtles, cetaceans and sharks. Further noted, that the authors expressed the need to expand the adoption of the subsurface gear design and collection of data and its analysis from other CPCs.
114. The Workshop participants inquired about the impact on shark populations of sub-surface gillnet settings and encouraged the authors to explore other variables such as vessel, skipper effects, among others to explore how surface vs sub-surface CPUE estimates may vary. It was expressed by WWF, that the data is currently highly aggregated but efforts are underway to disaggregate the data and explore signals that are currently hidden in the data.
115. Some of the workshop participants encouraged the authors that sub-surface gear may produce promising results and that they may be kept up-to-date on the findings of this work. Some participants suggested that this work could benefit bycatch mitigation work and encouraged to share detailed results with IOTC and its subsidiary bodies.

#### Trade data analysis as a means of control for management of Sharks (Markus Burgener, TRAFFIC)

116. The presenter described how trade data analysis can be an effective tool in supporting the sound management of shark products in international trade as it can assist in verifying reported landings or provide a proxy data source for landings where such data is absent or incomplete. The analysis of trade data can also assist in developing mass and value estimates of shark and ray products in international trade that have been sourced from IUU fishing operations, and other relevant trade dynamics such as trade routes, and source, transit and market states engaged in shark and ray product trade
117. Examples from Southern Africa were shown highlighting how trade data analysis has assisted in developing an estimate of the USD value of illegally caught South African abalone, and how it has revealed the under-declaration of shark product exports from South Africa, Namibia and Mozambique.
118. The workshop participants noted the WWF and TRAFFIC developed tool DETECT IT: FISH which is an online platform to for carrying out comparative analysis of the international trade in fish products.
119. The Workshop participants noted that trade data has its limitations, considering that certain countries may not be reporting or recording trade data under the correct HS codes, or for certain products the code descriptions used by countries are not sufficiently specific to allow for meaningful analysis. For instance, Pakistan does not record the amount of shark fins exported as they are aggregated under a separate HS code for frozen products. It was however noted by TRAFFIC, that there are situations, such as for high-value seafood products imported into East Asian countries, where the import data collected by these countries is of a sufficiently detailed nature that it can provide a more accurate depiction of what has been reported by the countries of export, for these products.

#### Introduction to the Rapid Assessment Toolkit for Sharks and Rays, and NPOA evaluator tool as a means of assessing National Plans of Action – Sharks (NPOA), and (Andy Cornish, WWF)

120. A new tool developed by WWF with James Cook University, Australia was outlined. The Rapid Assessment Toolkit for Sharks and Rays, focuses on 6 tools: Taxonomy, Genetics, Creel and Market Surveys, Baited Remote Underwater Video Systems, Tagging and Tracking, and Citizen Science, and helps deliver on the International Plan of Action by supporting the development of NPOA Sharks. The tool will be released in the coming weeks, and shared with all workshop participants.

121. A WWF and TRAFFIC internal working tool, The NPOA evaluator was introduced to participants. The tool provides a simple scoring system, based on the original FAO Guidance for NPOA Sharks and subsequently updated that can be used as a guide to drafting Shark Assessment Reports and NPOA Sharks, evaluating drafts or existing NPOA Sharks, and monitoring progress over time.
122. A tool under development between WWF and James Cook University (JCU), A Practical Guide to the Effective Design and Management of MPAs for Sharks and Rays, was also introduced. This follows an extensive review by JCU of the effectiveness of existing MPAs for sharks, and a multitude of elasmobranch movement studies, and will be released by April 2019.

#### **Group Exercise – Breakout sessions on undertaking SWOT analysis of the NPOAs (All Participants)**

123. The Workshop participants were tasked to break out into groups and undertake a SWOT analysis of the adopted, existing draft NPOA for sharks to answer some of the fundamental questions, and identify key players in the region and mechanisms that exist to improve regional coordination, joint programmes and initiatives that can be taken forward by the coastal states of the NIO. The groups were based on the individual countries, Pakistan, Sri Lanka and the Maldives. The results of the group exercises can be found in appendix III.

#### **SWOT analysis outcomes – Maldives**

124. Representatives from Maldives presented the timeline of the shark conservation work in the Maldives, identifying that in 2010 the Maldives was declared a shark sanctuary and a NPOA was developed and adopted in 2015.
125. The strengths identified by the Maldives were discussed, which described the active readiness of the Maldivian government to reform shark conservation and providing a platform to regional countries encouraging to undertake joint initiatives and collaborate on research projects.
126. It was also discussed that insufficient information on sharks, securing funding and limited education and awareness were the key main challenges identified, in addition, to noting that fishers have been complaining about the increase in shark populations around reefs and the limited research on the abundance and population structure of sharks in the Maldives remains an area of interest.
127. The Workshop participants noted the need for undertaking a socio-economic study on the role of sharks in the fisheries/tourism sector.

#### **SWOT Analysis outcomes – Sri Lanka**

128. The Sri Lankan representative mentioned that Sri Lanka has been successful in meeting 22 out of 28 objectives of the NPOA for sharks and are currently revising the adopted NPOA to ensure that they can respond to emerging issues and challenges, considering that fisheries are dynamic and prone to change.
129. The Workshop participants noted the details of the management systems put in place by the Government of Sri Lanka on data collection, transparency and traceability of fishing vessels, in addition to the management measures adopted from multilateral agreements and national legislation.
130. It was mentioned that the revision of the current NPOA is based on identified weaknesses to improve coordination and networking among the different government and research organizations.
131. The presenter also mentioned that the NPOA evaluator tool helped the Sri Lanka group in undertaking the SWOT analysis for the adopted NPOA on sharks and rays.

132. The Workshop participants noted the need for regional collaboration and to undertake the socio-economic study on the shark fisheries/bycatch in the country.

#### SWOT Analysis outcomes – Pakistan

133. The Workshop participants noted that Pakistan has a draft NPOA for sharks which through immediate discussions, dialogues with key stakeholders can be put up for adoption.
134. Pakistani representative mentioned that the provincial governments have already placed legislation for management and conservation of sharks and also has a deep-sea fishing policy in place which aims to regulate gillnet fisheries, in addition to acknowledging the work by WWF on exploring bycatch mitigation options in gillnet fisheries.
135. The workshop participants noted the need for building capacity, improving coordination among government line departments and improving the data collection mechanisms in the fisheries sector.
136. The presenter also discussed the opportunities and the challenges that Pakistan faces in improved management of sharks. The workshop further noted the interest of undertaking eDNA study to identify hotspots of priority species.

#### RPOA for sharks; experiences from SWIO/Pacific (Shelley Clarke, FAO ABNJ Tuna Project)

137. The Workshop participants noted the experiences from the Pacific region in developing the regional plan of action for sharks.
138. The presenter explained that for developing regional plan of actions, a sub-regional body, or an umbrella structure is required or at least preferable, further noting that in the Pacific, the Forum Fisheries Agency (FFA) provided the institutional structure, similar to RPOA development in Bay of Bengal under the Bay of Bengal Large Marine Ecosystem Programme (BOBLME).

### Day Three

#### Recap Day Two and Way forward (Facilitator)

139. A recap on the second day identified the progress made during the two days of the workshop and the need to focus on key areas for day three. The Workshop participants were apprised that the group exercise was helpful in identifying the key areas of work/improvement for governments to focus on for shark conservation and management at the national level, and to take some of the key opportunities and regional initiatives forward.
140. The Workshop participants were apprised on the changes in the agenda for day three, which identified the need to focus on joint proposals, identifying key areas of work through prioritization, working with stakeholders in the workshop followed by a group exercise.

#### Joint Proposals – IOTC/CMS among others and prioritizing national and regional actions

141. The Workshop participants discussed some of the key joint proposals that can be taken forward to the Commission meeting in June 2019 in Hyderabad, India.
142. The Workshop participants discussed and some participants encouraged the development of proposals on bycatch mitigation options for sharks and other species based on the implementation of precautionary mitigation measures particularly for gillnets, amendments to data recording and regional observer scheme resolutions 15/01, 15/02 and 11/04.
143. The workshop participants noted the areas of engagement and themes that the participants can focus on, protection of critical habitats, migratory corridors, working closely with RFMOs, research, data collection and capacity among others.

144. The Workshop participants undertook a short exercise on prioritizing 1-2 or more key priorities at the national and regional level. The participants were given 10 minutes to note down the priorities which were discussed and classed into two categories, national and regional.
145. The Workshop participants noted that they would need to focus on regional priorities only, and further rank them using an Eisenhower box. The results of the Eisenhower box are provided in appendix V, where information was prioritized as most urgent, and most important.
146. The Workshop participants noted that there were three main priorities that were identified in the Eisenhower box.
147. The workshop participants used the three main themes identified as most urgent and most important to have another break out group session, dividing into three groups, taking a key priority each to develop the road map for the regional plan of action for sharks.

#### Group Exercise – breakout sessions to develop a road map for RPOA sharks in NIO

148. The Workshop participants helped develop the road map which is provided in appendix VI. The outcomes and the next steps of the workshop were discussed; it was agreed that any Recommendations emerging as an outcome of the workshop may be adopted during the intersessional period.
149. The workshop participants worked in three groups, on the following priorities:
  - a) IOTC measures and bycatch mitigation research and implementation
  - b) Communication and Coordination – sharing knowledge (identifying areas of collective actions)
  - c) Standardized data collection methods, including through the IOTC, CMS, CITES, etc.

#### Recommendations of the Workshop

150. The Workshop **ACKNOWLEDGED** the need for a stronger regional cooperation and **ENCOURAGED** participants of the workshop to support and facilitate regional research projects. **RECOGNIZING** the geo-political differences in the NIO region, the Workshop **RECOMMENDED** that additional coordination mechanisms are identified/established to help improve management of highly migratory species, such as Sharks.
151. The Workshop **NOTED** that member countries in NIO are actively engaged in the catch or bycatch of sharks (with an exception to Maldives) which needs immediate attention, **ACKNOWLEDGING** the results of the bycatch mitigation in Pakistan, **RECOMMENDED** the replication of such initiatives, such as use of sub-surface gear, LED light sticks as bycatch mitigation measures in gillnet fisheries in the NIO to have wider coverage strengthening research on mitigation measures.
152. The Workshop **NOTED** the results of the LED light stick trials in Indonesia conducted by WWF-Indonesia and the Workshop participants **RECOMMENDED** the author to present his research at the 15<sup>th</sup> Session of the IOTC Working Party on Ecosystem and Bycatch.
153. The Workshop **ENCOURAGED** strengthening the evidence on mitigation measures discussed, and **RECOMMENDED** to engage member states of the IOTC through its working party meetings to establish support for mitigation measures for potential adoption through the introduction of a conservation and management measure for gillnet fisheries. The workshop noted that submission of such a joint proposal would require sponsorship from member states of the IOTC for submitting at the annual meeting in 2019-2020.
154. The Workshop **NOTED** the need for data analysis of bycatch and sharks and rays species composition data, and **RECOGNIZED** that the IOTC Secretariat had developed an Indian Ocean Shark Year Plan (IOSYP) which was endorsed by its scientific committee. The Workshop

- RECOMMENDED** that WWF may propose to IOTC through sharing of the report that the programme is revised and that IOTC continues the IOSYP.
155. The Workshop **ENCOURAGED** the exploration of funding opportunities to support the development an institutional framework through a relevant regional organisation in the NIO region to further develop a regional plan of action for sharks
  156. The Workshop **RECOMMENDED** to develop a consortium of like-minded NGOs, such as WWF, ISSF, Blue Resources Trust, WCS among others in the region to continue to support capacity building and pursue actions at national level with respective governments.
  157. The Workshop participants discussed and **ENCOURAGED** governments that a ban on purchase and exports is put in place for species of special interest having a higher protection status. The Workshop **RECOMMENDED** that the species of special interest are recognized and adopted by the IOTC member states.
  158. Some participants discussed the challenge in defining large-scale vessels and **RECOMMENDED** that interested parties may develop a strong case on reclassification of vessels and submit to the relevant working party meeting of the IOTC.
  159. The Workshop participants recognized the need for improving reporting requirements for Resolution 15/01 (on catch and effort data), 15/02 (On mandatory statistical requirements) for discards and of shark mortality, and **RECOMMENDED** that sharks are identified and reported to species/family level to the IOTC.
  160. The Workshop participants acknowledged the efforts of WWF-Pakistan for its well-developed crew-based observer programme and **RECOMMENDED** that the crew-observers scheme is replicated, scaled and coupled with the use of electronic monitoring systems for improved data recording of target and non-target species.
  161. **ACKNOWLEDGING** the need for stronger regional cooperation for the fulfillment of the identified objectives, the Workshop **RECOMMENDED** that mechanisms are identified/established to help implement the IOTC Regional Observer Scheme and undertake a feasibility of the alternative data collection systems so they can be verified by the scientific committee of the IOTC, in particular for small-scale fisheries. It was further noted that information may be provided at the latest to the Working Party on Data Collection and Statistics planned to be held in November 2019.
  162. The workshop participants explored mechanisms for regional cooperation and exchange, it was **RECOMMENDED** that an intergovernmental platform would be suitable for moving forward of the implementation of the roadmap for RPOA sharks in NIO region. It was suggested that CMS sharks MoU could potentially serve as the platform to facilitate communication and decision making by governments.
  163. The workshop was closed with thanks to all the organizers, participants, delegates and resource persons of the workshop. The workshop also thanked the facilitator.
  164. The workshop report is approved by all participating coastal states and participants. It was agreed that the workshop outcomes will also be shared with member countries which were not able to attend the workshop.
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## APPENDIX 1

### LIST OF PARTICIPANTS

#### NATIONAL PARTICIPANTS – PAKISTAN

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**APPENDIX II  
AGENA OF THE WORKSHOP**

Time	Activity	Responsibility
<b>Day One – 26 February 2019</b>		
<b>Inaugural Session</b>		
0830- 0900	Registration of the participants	WWF-Secretariat
0900- 0905	Recitation from the versus of Holy Quran	WWF-Secretariat
0905 – 0915	Welcome note to participants of the workshop	Dr Babar Khan
0915 – 0930	Key note address	M. Moazzam Khan
0930 – 0945	Remarks by the Chief guest	TBC
0945 – 1000	Tea Break	
<b>1000-1030</b>	<b>First Technical Session: Setting the context for shark and ray management</b>	
1000 – 1010	Importance of shark and Ray Management – Global Perspective	Andy Cornish
1010 – 1020	Overview of CMMS adopted by tRFMOs – in particular shark and ray management in the Indian Ocean	Claire Van der Geest
1020 – 1035	Status of compliance towards NPOA development for countries.	Shelly Clarke
1035 – 1050	Shark and ray management: CMS and CMS Shark MoU	Andrea Pauly
1050 – 1110	Shark and ray management in CITES context	Daniel Fernando
1110 – 1130	Open discussion	Facilitator
1130 – 1300	<b>Session II – Regional Context on shark and ray management</b>	
1130 – 1215	Country report on Shark and Ray management; in particular status of NPOA for Sharks and Rays	Maldives, Sri Lanka, Pakistan
1215 – 1230	Shark Assessment Report of Pakistan	M. Moazzam Khan
1230 – 1300	Open discussion	
1300-1400	<b>Lunch and Prayer</b>	
1400 – 1420	Conservation status of sharks and rays in the Arabian Sea and adjacent waters region	Rima Jabado
1420 – 1600	Open discussion	Facilitator
1600	Tea break and End of the day	
1630– 1700	<b>Debrief with resource persons</b>	WWF, Andy, Claire, Rima, Andrea, Shelly, Daniel, Marie Salem, Markus, Yoga
<b>Day Two- 27 February 2019</b>		
<b>Session IV: Tools and applications for the assessment of shark’s fisheries</b>		
0900- 0910	Recap to Day One	Facilitator(s)
0910 – 0930	Outcomes of the RL assessment on sharks in the Arabian Sea: Key species of interest for management	Rima Jabado
0930 – 0945	Panel discussion on bycatch mitigation options and resources (BMIS) in NIO fisheries	Umair/Yoga/Shoaib/Shelly
0945 – 1000	Trade data analysis: How to manage sharks effectively using trade data?	Markus Burgener
1000 – 1030	Introduction to RAT guide and NPOA evaluator tool as a means of assessing effectiveness of the NPOA	Andy Cornish

Time	Activity	Responsibility
1030 – 1100	<b>Tea Break</b>	
1100 – 1300	Undertaking SWOT Analysis of the NPOAs – group exercise (answering fundamental questions) <ul style="list-style-type: none"> <li>- Share the NPOA drafts/adopted documents with participants</li> <li>- Dive into group discussions (country-based groups) to identify strengths, weakness, opportunity and threats</li> <li>- Identify key players in the region and mechanisms for improving regional coordination</li> <li>- Identify joint regional Programmes/projects proposals to be taken forward at the regional level</li> </ul>	Resource persons
1300 – 1400	Lunch Break	
1400 – 1530	Reporting back from the groups	Group Leaders
1530 – 1600	<b>Tea Break</b>	
1600 – 1630	RPOA for sharks; experiences from SWIO/Pacific	Shelly/Markus
1630 – 1700	End day and debriefing with resource persons	All resource persons
<b>Day Three- 28 February 2019</b>		
<b>Session V: Next steps and way forward for NPOA and RPOA</b>		
0930 – 0945	Recap to Day Two; reflecting back on specific objectives of the workshop	Facilitator(s)
0945 – 1000	IOTC joint proposals – Eisenhower box exercise	Claire
1000-1030	Crafting priorities to take forward and discussion	Facilitator(s)
<b>1030 – 1100</b>	<b>Tea Break</b>	<b><u>15 minutes only</u></b>
1100 – 1200	Group Exercise based on template; developing a road map to help move towards development of RPOA and strengthening NPOAs	Resource persons
1200 – 1300	Report back by group leaders	
<b>1300 – 1400</b>	<b>Lunch Break</b>	
1400 – 1500	Adoption of Recommendations and Close of Workshop	

Country	Strengths	Weaknesses	Threats	Opportunities
<b>Pakistan</b>	<ul style="list-style-type: none"> <li>Federal and provincial departments for the maintenance of shark data</li> <li>Coastal communities support implementation of NPOA are involved in the process</li> <li>1<sup>st</sup> draft already available and can be improved for adoption.</li> <li>Close collaborations between NPOA relevant government departments and WWF-Pakistan.</li> <li>Deep sea fishing policy adopted in 2018</li> <li>Existing ban n catch of CITES species</li> <li>Preliminary results of b catch mitigation in hand, i.e. LED experiments, subsurface gillnetting, multifilament gillnets.</li> <li>Improving National compliance at International forums, e.g. IOTC.</li> </ul>	<ul style="list-style-type: none"> <li>Low capacity in government departments in key positions</li> <li>Lack of trained personnel</li> <li>Lack of funding available</li> <li>Lack of national level integrated coastal zone management strategy</li> <li>Monopoly of buyers, i.e. economy centred market drivers</li> <li>Absence of proper fisheries data collection mechanism</li> <li>Gaps between official landing statistics and trade data</li> </ul>	<ul style="list-style-type: none"> <li>Prioritization issues</li> <li>Fast depletion f rate sharks</li> <li>Collapsing food webs</li> </ul>	<ul style="list-style-type: none"> <li>Port state measure/planned visits of FAO delegation to Pakistan</li> <li>Sawfish eDNA studies underway which will lead to management plans, e.g.: restricted areas size restriction, gear limitations.</li> <li>Replication of indigenous solution to bycatch mitigation in region i.e. experience sharing.</li> </ul>
<b>Maldives</b>	<ul style="list-style-type: none"> <li>Maldivian EEZ already declared as a shark sanctuary</li> <li>NPOA already developed and adopted</li> <li>NPOA reinforces existing legislature</li> <li>Provides a platform or international and regional cooperation for improved management of sharks, in particular migratory species</li> </ul>	<ul style="list-style-type: none"> <li>Insufficient monitoring and review of the implementation process of the NPOA</li> <li>Does not identify priority levels of actions</li> <li>Difficult in securing local funding as a shark sanctuary</li> <li>Overlapping mandates between relevant agencies</li> <li>Limited scientific and educational awareness</li> </ul>	<ul style="list-style-type: none"> <li>Depredation issue- could undermine the current NPOA</li> <li>Successful implementation of goals requires regional cooperation</li> </ul>	<ul style="list-style-type: none"> <li>Helps to secure funding from international organizations</li> <li>Improves standing on regional/international platforms</li> <li>Provide data for IOTC shark stock assessments</li> </ul>

Country	Strengths	Weaknesses	Threats	Opportunities
	<ul style="list-style-type: none"> <li>• Includes provisions for championing shark conservation in the region via relevant RFMOs and conventions etc.</li> <li>• Acts as an instrument for promoting scientific research on sharks</li> <li>• Provides a mechanism for cooperation within relevant agencies</li> </ul>			
<p><b>Sri Lanka</b></p>	<ul style="list-style-type: none"> <li>• Sri Lanka has achieved 79% of previous NPOA objectives.</li> <li>• Revised NPOA uses regional offices to implement objectives</li> <li>• NPOA is species specific and fisheries specific</li> <li>• Proper collection of data mechanism in place and a good understanding of species composition</li> <li>• Information on target and bycatch fisheries available</li> </ul>	<ul style="list-style-type: none"> <li>• Regular coordination meetings did not take place</li> <li>• No specific management actions</li> <li>• Insufficient awareness conducted</li> <li>• Negative attitudes from fisheries towards NPOA</li> <li>• Alternative livelihoods not addressed</li> <li>•</li> </ul>		<p>Species level identification and associated trainings to be improved</p>



National Priorities for Sharks	Regional Priorities for Sharks
<ol style="list-style-type: none"> <li>1. Data collection to support stock assessments – landing sights and onboard vessels</li> <li>2. Socio-economic considered in the plans</li> <li>3. Bycatch mitigation</li> <li>4. Education of the fishers (role in the ecosystem, EBFM, Spp. ids, etc.) of the buyers on the same issue so they don't purchase these species</li> <li>5. MCS – VMS especially, support and monitor implementation of protected areas</li> <li>6. Political influence – lack of funds</li> <li>7. Trade monitoring</li> <li>8. Increase the value of the landed catch</li> <li>9. Internal consultative group</li> <li>10. Consultation with fishers</li> <li>11. Regular review of objective, monitoring and review of the NPOA</li> <li>12. National legislation – due to lack of capacity and resources</li> </ol>	<ol style="list-style-type: none"> <li><b>1. IOTC measures and bycatch mitigation*</b></li> <li><b>2. Stock assessments and population structures, migratory pathways*</b></li> <li>3. Communication and Coordination – sharing knowledge</li> <li><b>4. Focal point in each country, initiate dialogue*</b></li> <li><b>5. Sharing knowledge, consultative groups, lack of formal consultative group, bi-annual meetings across region*</b></li> <li>6. Standardised data collection methods, including through the IOTC</li> <li>7. How to circumvent the politically delicate nature across the region</li> <li>8. Reviewing commonalities of the NPOAs</li> <li>9. Sharing developments and updates from NPOAs to support outcomes at the RPOA</li> </ol>
<p><b>*In bold are those priorities that were identified by the participants of the workshop as the most important ones to be discussed at the regional level with respect to shark conservation and management.</b></p>	



<p><b><u>IMPORTANT but LESS URGENT</u></b></p> <ul style="list-style-type: none"> <li>a) Regional research, e.g., Stock / population structures, migratory pathways, etc.</li> <li>b) Focal point in each country, initiate dialogue</li> <li>c) Sharing knowledge, consultative groups, lack of formal consultative group, bi-annual meetings across region</li> </ul>	<p><b><u>IMPORTANT AND URGENT</u></b></p> <ul style="list-style-type: none"> <li>a) <b>IOTC measures and bycatch mitigation research</b></li> <li>b) <b>Communication and Coordination – sharing knowledge (identifying areas of collective actions)</b></li> <li>c) <b>Standardized data collection methods, including through the IOTC, CMS, CITES, etc.</b></li> </ul>
<p><b><u>LESS URGENT AND LESS IMPORTANT</u></b></p> <ul style="list-style-type: none"> <li>a) Sharing developments and updates from NPOAs to support outcomes at the RPOA</li> </ul>	<p><b><u>URGENT BUT LESS IMPORTANT</u></b></p>

The workshop participants used the Eisenhower box to underline the most urgent and most important areas of work for improving shark and ray management in the NIO. These shortlisted areas of work were used for developing a road map for RPOA.



Priority Area	Areas of actions (focused activities)	Stakeholder/ partners Responsibility (working groups/ leads/ support)	Timeframe Short = within 12 months Medium = t2-3 years Long = ongoing effort	Additional funding / resources required	Next steps
<b>IOTC measures and bycatch mitigation research</b>	<u>IOTC Measures</u> <ul style="list-style-type: none"> <li>Improve reporting requirements in 15/01, 15/02 of discards, shark mortality to species level if possible</li> </ul>	Coastal State Government(s) (lead) All stakeholders: industry, NGO (support)	Short term. NB timeframes need to take into account the capacity limits of the developing States.	No funding. Resources including time and expertise to develop and execute proposals.	<ol style="list-style-type: none"> <li>Present to G16 group</li> <li>Look to progress from there.</li> </ol>
	<ul style="list-style-type: none"> <li>Amend shark resolution to require that sharks are identified to species/family level (aspirational target), will likely consist of continual improvement: identification of family groups, then moving to species level.</li> </ul>	Coastal State Government(s) (lead) All stakeholders: industry, NGO (support)	Medium term. NB timeframes need to take into account the capacity limits of the developing States.	No funding. Resources including time and expertise to develop and execute proposals.	<ol style="list-style-type: none"> <li>Present to G16 group</li> <li>Look to progress from there.</li> </ol>
	<ul style="list-style-type: none"> <li>Capacity building of observers/enumerators to identify sharks to species (build capacity to improve species identification over time)</li> </ul>	National Government(s) (lead) All stakeholders: industry, NGO (support)	Long-term. Capacity of fishers will need to be developed through time, will likely consist of continual improvement: identification of family groups, then moving to species level.	Yes funding. Workshops for fishers Materials: apps, videos, printed materials, Ongoing training workshops for observers Community activities: discussion groups, guest speakers, attending celebrations, competitions	<ol style="list-style-type: none"> <li>Develop a program</li> <li>Review existing materials</li> <li>Develop a funding proposal</li> </ol>

Priority Area	Areas of actions (focused activities)	Stakeholder/ partners Responsibility (working groups/ leads/ support)	Timeframe Short = within 12 months Medium = 2-3 years Long = ongoing effort	Additional funding / resources required	Next steps
				International exchanges to share knowledge	
	<ul style="list-style-type: none"> <li>Support and lead efforts to develop and implement e-reporting for both target and bycatch species (including sharks), with built in verification methods</li> </ul>	Government (lead) All stakeholders: industry, NGO (support)	Medium term. NB timeframes need to take into account the capacity limits of the developing States.	Yes funding. Workshops for fishers Materials: apps, videos, printed materials, Ongoing training workshops for observers Community activities: discussion groups, guest speakers, attending celebrations, competitions International exchanges to share knowledge	<ol style="list-style-type: none"> <li>Develop a program</li> <li>Review existing materials</li> <li>Develop a funding proposal</li> </ol>
	<ul style="list-style-type: none"> <li>Amend bycatch measures to include gillnet and long line best practice and/or scientifically proven mitigation techniques (e.g. subsurface deployment)</li> </ul>	Coastal State Government(s) (lead) All stakeholders: industry, NGO (support)	Medium term.	No funding. Resources including time and expertise to develop and execute proposals.	<ol style="list-style-type: none"> <li>Present to G16 group</li> <li>Look to progress from there.</li> </ol>
	<u>Bycatch Mitigation Research</u> <ul style="list-style-type: none"> <li>Priority research on bycatch mitigation for gillnets and extension</li> </ul>	Government(s) for gillnet those countries using GN and for LL those countries using LL, research agencies,	Medium term.	Yes funding. Workshops for fishers	<ol style="list-style-type: none"> <li>Review existing research and traditional knowledge of fishers</li> </ol>

Priority Area	Areas of actions (focused activities)	Stakeholder/ partners Responsibility (working groups/ leads/ support)	Timeframe Short = within 12 months Medium = t2-3 years Long = ongoing effort	Additional funding / resources required	Next steps
	<ul style="list-style-type: none"> <li>• Second priority for longline bycatch mitigation research extension</li> </ul>	including international research agencies		Materials: apps, videos, printed materials, Ongoing training workshops for observers Community activities: discussion groups, guest speakers, attending celebrations, competitions	2. Building on the existing research, develop research proposals 3. Share with other coastal States through the G16 and other international institutions
<b>Communication and Coordination – sharing knowledge (identifying areas of collective actions)</b>	<ul style="list-style-type: none"> <li>• Develop a taskforce on sharks in the NIO (similar to turtle taskforce under the IOSEA) as a sub-committee of G16 (a brief proposal will be submitted to G16)</li> <li>• Communications platform on CMS website</li> <li>• Biannual face-to-face meetings?</li> <li>• Information / knowledge products (IEC materials i.e., multi-media stories, published papers etc.)</li> </ul>	<p>Three governments (of Maldives, Pakistan, and Sri Lanka) will take the lead on developing a brief proposal (1-2 pager) and submitting it to G16 to take the task force as a sub-committee</p> <p>National focal points of CMS will submit the proposal for on-line platform to CMS (pending??)</p> <p>(Note: National focal points for the taskforce</p>	<p>02 weeks to draft the proposal and feedback</p> <p>02 months to get internal consent (of governments), and submit to G16</p>	Funding needed for regional meeting (face-2-face)	Identify next opportunity to submit the proposal to G16

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		and comms platform to be the same)			
<b>Standardized data collection methods, including through the IOTC, CMS, CITES, etc.</b>	Expand and continue crew-based observer program <u>with</u> EMS	Fisheries dept.		Being funded by ABNJ in Pakistan however additional funding necessary	Pakistan: adopt crew-based observer program from WWF
	Introduce port-based sampling  Determine a representative sampling scheme	Fisheries department			
	Tell the story of how the crew-based observer program has worked in Pakistan – to obtain additional funding and entice other countries to join				
	Implement electronic logbooks also with smaller vessels (doubles as VMS and ability to take photographs of bycatch)				