

## **Executive Summary of the Final Report**

“A Study on the Sustainability of Fisheries of the Straits of Malacca”

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## **1. Introduction**

This Executive Summary considers the highlights of the Scoping Report, Design and Selection of the Pilot, Pilot Results and considers some decisions for the Future and Conclusions.

## **2. Summary of Scoping Report**

An extensive scoping study was carried out in the national implementation of SDG 14, where the mission, vision, objectives, policies, strategies, action plans, concerns and priorities laws, and governance structures of the various agencies responsible for ocean governance in Malaysia were considered. The Scoping Report was circulated to all the ocean-related stakeholders and deliberated at the First National Workshop on Ocean Accounts for Malaysia. Stakeholders for this Project were divided into data providers and data users. There is no ocean policy in Malaysia although there is a National Policy on Biological Diversity 2016-2025.

## **3. Activities undertaken in Implementing the Pilot**

### **3.1 Design and Selection of the Topic for Pilot at the First National Workshop**

Fifty-three stakeholders from 30 agencies attended the First National Workshop on Ocean Accounts for Malaysia, organized on 4<sup>th</sup> and 5<sup>th</sup> April 2019 at the DOSM where they reviewed, responded and considered the priorities for further development by the Pilot. Four topics were adopted from these broad challenges. These were focused on a Study of (1) The Living resources (Straits of Malacca); (2) Protecting the marine habitat (Peninsular Malaysia); (3) Ocean conservation (indicators); and (4) Klang Straits (land-based). Votes were cast by the attendees to determine which topic would be accorded the highest priority.

The topic '*Living Resources of the Straits of Malacca*' in terms of work to be done required the compilation of existing data for the area. The six-month output would require drawing up an Inventory of available data and the running of Test accounts for extent & conditions. It was a Proposal for an analytical project. It required a collaboration between DOSM and the State & local authority, Forestry, Department of Fisheries, Ministry of Water, Land and Natural Resources (KAT), Marine Parks, Ministry of Agriculture and Agro-based Industry (MOA), Fisheries Development Board of Malaysia (LKIM), Malaysian Institute of Maritime Affairs (MIMA), Local universities such as the University of Malaya (UM) and the National University of Malaysia (Local univs.), the Department of Minerals and Geoscience, the National Hydraulic Institute of Malaysia (NAHRIM) and the Drainage and Irrigation Department (DID). This topic got 22 votes.

For the topic 'Protecting marine habitat (Peninsular Malaysia)' the work to be done included getting data on Fish catch/stock, Ship movement and Mapping unprotected resources. The six-month output would require an Initial map of unprotected reserves, Test accounts for extent & aquatic resources and Assessment of pressures. It required a collaboration between the DOSM and Marine Parks, Fisheries and Marine Department, the Department of Environment (DOE), State and local authority, and the Drainage and Irrigation Department. The priority accorded was one vote. This topic addressed concerns in living resources in the ecosystem of the coastal stretch of

Terengganu in line with SDG 14 in the east coast of Peninsular Malaysia and port and fisheries activities in the area of the Klang valley (from the sea to river) as there were port activities contributions to marine pollution with impact on mangroves and fisheries.

The topic ‘Ocean Conservation (indicators)’ required work to be done on the water quality, CO<sub>2</sub> emissions, and land-based pollution. The six-month output required an Agreement on indicators, Mapping of spatial data, and Test accounts for conditions. It required a collaboration between DOSM and DOE, KATS, Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC), DOA, and the Marine Department. The priority accorded was seven votes. This topic was concerned about the depletion of fish stocks and oil and gas resources; coral reefs; tourism and enhanced livelihood of the local communities.

The final topic ‘Klang Straits (land based)’ in Peninsular Malaysia required work to be done in two areas: (1) Distinguish land-based activities; and (2) Estimate pollutants. The six-month output would be an Inventory of available data; Integration of scientific data; and Test accounts for water emissions, wastewater, solid waste. It required a collaboration between DOSM and the DOE, Ministry of Water, Land and Natural Resources (KATS), Marine Department, DID, Port Authorities, NAHRIM, DOA, Forestry, UM and MIMA. The priority accorded was 12 votes. This proposal was concerned about the marine region which provides major ecosystem services to the Klang valley. Ports, invasive alien species, fisheries and aquaculture, indigenous population dependent on fisheries, land-based sources of marine pollution, mudflats and mangroves were considered in this topic.

The topic “Living Resources of the Straits of Malacca” garnered the most votes. However, it was not finalized by the DOSM. This topic was selected because it reflected on all SDG 14 targets, directly and indirectly. There were challenges to mangroves, coral reefs, mud flats along the Straits of Malacca. The impact of climate change and erosion, pollution and oil spills from ship collisions on these habitats in the Straits were considered. It was felt that the way forward was to increase the number and size of the marine protected areas, regulate mangroves and coral reef protection and enhance safety of navigation. For the Straits of Malacca, there was existing data on fish production (capture fisheries), fish price, a vessel list and vessel movements. There were also records of increase in fish stock, an increase in fishermen’s livelihoods, and guarantee of food security for consumption.

In conclusion, the First Workshop deliberated on the stressors on the ocean surrounding Malaysia and its resources. As only one topic would be confirmed for the Pilot, it was an important case study as it would be a prototype to conduct many more studies in the future, given the many issues and topics of concern.

## **2.2 Activities undertaken to refine the Pilot**

The activities undertaken in refining and implementing the pilot focused on the Establishment of a Working Group, Research, Consultation, Data collection, integration, Mapping Analysis, Accounting, and Valuation. Considerations of data availability and time constraints, as this Pilot

was the first effort of its kind in Malaysia, prompted several robust administrative and scientific meetings where various high-level and working groups were established and a specialist scientific team called the UM Team was constituted for this purpose. The Working Group (WG) comprised the High-Level Group of Stakeholders, the DOSM personnel and the UM Team. The High-Level Group (HLG) for the System of Environmental-Economic Accounting (SEEA) Ocean Accounts in Malaysia took place on 2nd July and it was chaired by the Chief Statistician YBhg. Dato' Sri Dr. Mohd Uzir Mahidin. On 23 July 2019 (Tuesday), the Small Working Group (SWG) met at DOSM for the first time. The SWG comprised the Department of Fisheries, Department of Environment, Plan Malaysia, Marine Department, Remote Sensing Agency, Forestry Department, the UM Team, DOSM and Centre for National Geospatial Data. The UM Team comprised Professor Azizan Abu Samah, Dr Rizman Idid, Dr Wee Cheah, Dr Loh Kar Hoe, Dr Illyani Ibrahim, Dr Jillian Ooi, Dr Sahadev Sharma and Professor Mary George. The DOSM sought departmental approvals for the release of data upon agreement of the Pilot topic. Finally, there was an analysis and examination of the data presented and experimental results obtained at the Second National Workshop on Ocean Accounts for Malaysia held on 17 October 2019. The stakeholders adopted the results. The Malaysian Pilot was presented at the Global Ocean Accounts Partnership, 12-16 November 2019.

### **3. The Pilot**

#### **3.1 Research Question**

The research question focussed on food security risk under climate variability. The approach we took was from ocean to land. Most of the other works are from land to ocean. So the Malaysian study is in the reverse.

#### **3.2 Methodology**

The study focused on fish landings in the west coast of Peninsular Malaysia in the Straits of Malacca from 1998 to 2017. Fish landings data were obtained by extracting data from the fisheries report published annually by the Department of Fisheries, Malaysia. Three major drivers that have an impact on fisheries in the Straits of Malacca were identified: (1) Sea surface temperature (SST), (2) chlorophyll a (Chl) concentration (indication of primary production) and (3) total suspended matters (TSM, indication of river runoffs i.e. nutrient input). SST data were obtained from the National Oceanic and Atmospheric Administration (NOAA) Optimum Interpolated SST (OISS) product, Chl data from the European Space Agency (ESA) Ocean Colour Climate Change Initiative (OC-CCI) product, and TSM from ESA's MERIS satellite sensor. All three environmental data were averaged as show in Figure X.

#### **3.3 Analysis and Finding**

Overall, fish landings in the west coast of Malaysia Peninsular increased 31.1% from 1998 (551,183 metric tonnes) to 2017 (723,543 metric tonnes). Annual fish landings reached its peak in 2016. Seasonally, fish landings were high in summer and low in winter. On the contrary, Chl a concentrations were high in winter and low in summer in response to low SST in winter and high

in summer. Overall, Chl concentrations increased 17% and SST reduced 1.29°C. A drop of almost 70% of mangrove area was observed from 1995 to 2017 in the west coast of Peninsular Malaysia. In contrast, land-used for aquaculture and built-up area increased > 200% and 100%, respectively. Among the fish species, only anchovy appears to be sensitive to land-used change.

#### **4.Future plans**

As fisheries is under the purview of the agricultural division of the FAO, a joint workshop for a balance food sheet has been confirmed in DOSM by FAO where more than 20 agencies will be involved, on 25 -29 November 2019 in Malaysia. As Malaysia currently does not have an agency for food security, it is currently being administered by the Ministry of Agriculture and the Department of Statistics is going to spearhead the project on food security. The UM Team and DOSM are also considering implementing a similar pilot in the South China Sea. This Pilot brought statisticians, scientists and policy persons together for the first time under its umbrella. The experimental results of the Pilot endorse the impact of the climate on food security and primary productivity.