Global Dialogue on Ocean Accounting
November 12-15 2019
Malaysia

by
Department of Statistics, Ministry of Economic Affairs, Government of Malaysia
And
University of Malaya Team

Mary George
Azizan Abu Samah
Rizman Idid
Wee Cheah
Loh Kar Hoe
Illyani Ibrahim
Jillian Ooi
Sahadev Sharma
Outline

The Pilot Study
Scoping the pilot
Pilot Design
Activities & Result
Issues and Challenges
Policy
1. The Pilot Study

A Study on the Sustainable Fisheries of the Straits of Malacca

• Scoping report
  • Malaysia – attained independence from the Commonwealth of Nations on 31 Aug ‘57. Steep climb to ocean resource protection in the midst of nation-building
  • Importance of the ocean - a maritime nation surrounded by seas and heavily committed to SDG 14 through international treaty ratification and domestic implementation of laws, policies, strategies, action plans, among others
  • Plausible Concerns – unsustainable fisheries, loss of mangroves, and marine pollution including oil pollution resulting in poor marine water quality in the Straits of Malacca
  • Stakeholders – ocean governance.
  • Initiatives (policies, strategies, targets) – no specific policy on oceans but there are several policies and acts related to oceans (e.g biodiversity policy, transportation policy, environment act & fisheries act)
## 2. Scoping the pilot

### Table 3: List of Topics

<table>
<thead>
<tr>
<th>Topic</th>
<th>Work done</th>
<th>6-month output</th>
<th>DOSM and…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living resources (Straits of Malacca)</td>
<td>• Compile existing data for the area</td>
<td>• Inventory of available data</td>
<td>State &amp; local authority, Forestry, DOF, KATS, Marine Parks, MOA, LKIM, MIMA, Local univ., Minerals and Geoscience, NAHRIM, DID</td>
</tr>
<tr>
<td>Protecting marine habitat (2) (P.M’sia)</td>
<td>• Fish catch/stock • Ship movement • Mapping unprotected resources (tbd)</td>
<td>• Initial map of unprotected res. • Test accounts for extent &amp; aquatic resources. • Assessment of pressures</td>
<td>Marine Parks, Fisheries and Marine Dept, DOE, State and local authority, DID,</td>
</tr>
<tr>
<td>Ocean conservation (indicators)</td>
<td>• water quality, CO2 • land-based pollution</td>
<td>• Agreement on indicators • Mapping of spatial data • Test accounts for conditions</td>
<td>DOE, KATS, MESTECC, DOA, Marine Dept.</td>
</tr>
<tr>
<td>Klang Straits (land-based)</td>
<td>Distinguish land-based activities and estimate pollutants</td>
<td>• Inventory of available data • Integration of scientific data • Test accounts for water emissions, wastewater, solid waste</td>
<td>DOE, KATS, Marine Dept, DID, Port Authorities, NAHRIM, DOA, Forestry, UM, MIMA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>12</td>
</tr>
</tbody>
</table>
3. Pilot design

1. Main considerations for design of the pilot
   • 30 relevant stakeholder agencies related to ocean
   • Data availability
   • This Pilot is the first effort of its kind in Malaysia and there are no prior works on ocean accounts
   • Time constraint

ii. Pilot design
   • Research question
   • Data sources
   • Analytical outputs
4. Activities undertaken

- Activities undertaken in implementing the pilot
  - Establishment of working group – High-level Panel and Small Working Group
  - Research – hired three research assistants
  - Consultation – frequent consultation with DOSM and most directly relevant stakeholders
  - Data collection, integration
  - Mapping
  - Analysis, accounting, valuation ...
4.1 Data

1. **Fisheries data: 1998-2017**
   - fish landings, licensed vessels, gear type, etc.
   - Source: Department of Fisheries Malaysia

   - Source: Satellite data (Ocean Colour Climate Change Initiative)

   - Source: NOAA’s Optimum Interpolation SST (OISST) products

4. **Total suspended matter: 2002-2012**
   - Source: ESA’s MERIS satellite sensor

5. **Land coverage data**

6. **Spatial data (satellite imagery) from Malaysia Space Agency (MySA)**
5.1 Study Area

[Map showing the Straits of Malacca and surrounding areas]
Fish landings and licensed vessels in the Straits of Malacca from 1998-2017

No. of Vessels

- Outboard powered vessel
- Inboard-powered vessel
- Fish landings

Year

Fish landings (Metric Tonne)
Normalized Fish Landings per Outboard and Inboard Powered Vessel in West Coast Peninsular Malaysia, 1998-2017

Normalized Time Series of Marine Fish Landings (West Coast), 1998 – 2017

Fish landings per outboard powered Vessel

Fish landings per inboard powered vessels
Chlorophyll a vs. Sea Surface Temperature

- Chlorophyll – proxy of primary production which will influence fish catch
- Inverse relationship between primary production and temperature: low temperature indicates mixing of colder-high nutrient waters
Chlorophyll vs Sea Surface Temperature

$r = -0.58$
$p < 0.0001$

Chlorophyll vs Total Suspended Matter

$r = 0.35$
$p < 0.0001$
• Fish landings basically follows the chlorophyll trend
• After 2009, the trends of fish landings and chlorophyll started to split could be due to increase in the number of outboard vessels
## Ocean Account

<table>
<thead>
<tr>
<th>Parameters</th>
<th>1998</th>
<th>2017</th>
<th>Changes (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish landings (Metric Tonnes)</td>
<td>551,183</td>
<td>723,543</td>
<td>+31.3</td>
</tr>
<tr>
<td>Chlorophyll (mg/m³)</td>
<td>1.96</td>
<td>2.29</td>
<td>+16.8</td>
</tr>
<tr>
<td>Temperature (°C)</td>
<td>29.86</td>
<td>29.48</td>
<td>-1.29</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Area (km square)</th>
<th>1995</th>
<th>2006</th>
<th>2017</th>
<th>Changes (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mangrove</td>
<td>688.27</td>
<td>411.17</td>
<td>180.75</td>
<td>-73.7</td>
</tr>
<tr>
<td>Aquaculture</td>
<td>45.15</td>
<td>105.02</td>
<td>152.79</td>
<td>+238.4</td>
</tr>
<tr>
<td>Built-up</td>
<td>550.38</td>
<td>733.75</td>
<td>1113.92</td>
<td>+102.4</td>
</tr>
</tbody>
</table>
Anchovy Purse Seines

Landings (Metric Tonne/no. of gear)

- 1998
- 2003
- 2008
- 2013
- 2017
5. Summary of findings

- Total fish landings generally increased from 1998 and reaching its peak in 2016.
- Contrary to the increase in total fish landings, fish landings per vessel are decreasing.
- Fish landings per inboard vessel (bigger vessel) is increasing. This could be due to better strategy and technology.
- Impact of decrease in mangrove area seems to influence only selected species e.g. anchovy.
- Phytoplankton biomass appears to be the main driver of fish landings which is controlled by temperature and river runoffs.
- Thus, fisheries is indirectly subjected to the atmospheric/climatic phenomenon such as El Nino, monsoon, warming, etc.
6. Main challenges and needs

- Data
- Institutional (such as data sharing)
- Technical capacity
- Time limitation
- Guidance (such as the framework)
- International collaboration
Malaysia: Sustainable Development in Action

(International Commitment National Actions)


United Nations set up the World Commission on Environment & Development

Bruntland Report on definition and principles of sustainable development, 1987

Rio Summit: World commitment on sustainable development & Agenda 21, 1992

Kyoto Protocol, 1997

Millennium Development Goals, 2000

Johannesburg Earth Summit 2002, Rio +10

Bali Roadmap on Climate Change, 2007

Hyogo Framework for Action, 2005

2004 – Ministry of Natural Resources and Environment

2005 – National Physical Plan

Selangor Sustainable Development and Agenda 21

2005 – National Biotechnology Policy

2006 - Malaysia Ninth Malaysia Plan

– 4th Thrust (Improve Standard and Sustainability of Quality of Life)

2006 - National Biofuel Policy

2006 – National Urbanisation Policy

2009 (April) – Ministry of Energy, Green Technology and Water

2009(July) – National Green Technology Policy

2010 – National Climate Change Policy

Environmental Quality Act (EQA), 1974

Establishment of Department of Environment (DOE)

National Forestry Policy (1978)

National Energy Policy (1979)

National Depletion Policy, (1980)

Four Fuel Policy, (1981)


Local Agenda 21


Public Participation in Development Plan

Planning Doctrine – holistic devt for land use planning

National Biological Diversity Policy, 1998

2000 – 5th Fuel Policy, in the 8th Malaysia Plan

SREP (small renewal energy power program)

VISION 2020

IMP 1 (1986 - 1995)

IMP 2 (1996 - 2005)

Malaysia National Environmental Policy, 2002

7. Next steps for ocean accounts or policy
Malaysia: Sustainable Development in Action (cont’d)
(International Commitment National Actions)

7. Next steps for ocean accounts or policy

2010
2012
2013
2014
2015
2016
2019
10 MP 1 (2010 - 2015)
11 MP 1 (2016 - 2020)

2011 – National Policy on Biological Diversity 2016-2025
– National Physical Plan 3
– Merchant Shipping Ordinance 2016
– SDG Roadmap for Malaysia, 2016-2030

2019 – National Transport Policy 2019-2030
– Dasar Kebersihan Negara
– Initiative by Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC)

2016
• Implementation on Sendai Framework in Malaysia
• SDG Dashboard
• SDG Blueprint
• SDG Baseline Data

2017
• National SDG Council

2018
• Implementation SDG in Malaysia
Recent Development related to Green Growth
Development Planning in Malaysia

11MP is part of a Systematic Planning of National Development...

The theme of the 11MP is.....

“Anchoring growth on people”

1. People are the bedrock of the nation
2. Preparing people for the future
3. Everyone enjoys growth and development

New Economic Model

11th Plan Strategic Thrust

- Enhancing inclusiveness towards an equitable society
- Improving wellbeing for all
- Accelerating human capital development for an advanced nation
- Pursuing green growth for sustainability and resilience
- Strengthening infrastructure to support economic expansion
- Re-engineering economic growth for greater prosperity
PILLAR V: PRIORITY AREA B
Conserving natural resources

- **Strategy B1**: Conserving terrestrial and inland water areas
- **Strategy B2**: Conserving coastal and marine ecosystems
- **Strategy B3**: Enhancing livelihood and capacity of the indigenous and local communities

PRIORITY AREA A
Strengthening governance
- **Strategy A1**: Strengthening policy, legislation and institutional framework
- **Strategy A2**: Improving capacity and capability, enforcement and monitoring
- **Strategy A3**: Raising awareness and fostering a sense of shared responsibility

PRIORITY AREA C
Combating climate change and reducing disaster risks
- **Strategy C1**: Intensifying climate change mitigation
- **Strategy C2**: Augmenting climate change adaptation
- **Strategy C3**: Strengthening disaster risk management

MID TERM REVIEW
ELEVENTH MALAYSIA PLAN (11th MP) : PILLAR V

Pillar V: Enhancing Environmental Sustainability through Green Growth
Ocean Governance in Malaysia

**Economy**
- DOSM
- MOA
- MOT

**Environment**
- KATS
- MESTECC
- MOA

**Research**
- KATS
- MOA
- MESTECC

**Tourism**
- MOTAC
- MOA

**Security & Sovereignty**
- MOFA
- MINDEF
- MOHA
- PMD

*Note:
- DOSM: Department of Statistics Malaysia
- MOA: Ministry of Agriculture and Agro-based Industry
- MOT: Ministry of Transport Malaysia
- KATS: Ministry of Water, Land and Resources
- MESTECC: Ministry of Energy, Sciences, Technology, Environment and Climate Change
- MOTAC: Ministry Of Tourism, Arts & Culture
- MOFA: Ministry of Foreign Affairs
- MINDEF: Ministry of Defense
- PMD: Prime Minister Department
- MEA: Ministry of Economic Affairs
- MOHA: Ministry of Home Affairs
- MOF: Ministry of Finance

12 Ministries / Various Agencies
CAPTURE FISHERIES
- Fisheries Act 1985
- EEZ Act 1984
- National Agro Food Policy 2011-2020
- Licensing Policies and Procedures
- Strategic Planning of Department of Fisheries Malaysia 2011-2020
- FAO Code Of Conduct For Responsible Fisheries
- National Plan of Action (NPOA)

AQUACULTURE
- Fisheries (Inland Fisheries Aquaculture) (Federal Territory of Kuala Lumpur and Labuan ) Rules 2017
- Malaysian Good Agricultural Practices (MyGAP) Certification Scheme

OCEAN LEGISLATION/SUBSIDIARY LAW
- Merchant Shipping Ordinance 2016
- Federation Port Rules 1953
- Boat Rules 1953
MAPPING SDGs WITH 11th MP STRATEGIC THRUSTS

Enhancing inclusiveness towards an equitable society

Improving wellbeing for all

Accelerating human capital development for an advanced nation

Pursuing green growth for sustainability and resilience

Strengthening infrastructure to support economic expansion

Re-engineering economic growth for greater prosperity

Transforming public service for productivity

Sustainable Development Goals
Thank you!
Fish basically follows the chlorophyll trend

After 2009, the trends of fish landings and chlorophyll started to split could be due to increase in the number of outboard vessels
Total Number of Licensed Fishing Gears in West Coast Peninsular Malaysia, 1998-2017

Total Number of Licensed Fishing Gears in the West Coast, 1998 –2017

- Anchovy Purse Seines
- Fish Purse Seines
- Drift/Gill Nets
- Trawl Nets

Time

Number of Licensed Fishing Gears
Total Fish Landings of Major Gear Groups in West Coast Peninsular Malaysia, 1998-2017
Total suspended matter (proxy of turbidity i.e. indication of river runoffs)

- General trend: High concentrations in summer and a smaller peak in winter
- Not signification interannual trend
Mangrove area in the state of Selangor (close to Kuala Lumpur)

Coverage: 261.34 km² 137.73 km² 49.52 km²
Aquaculture area in the state of Selangor (close to Kuala Lumpur)

<table>
<thead>
<tr>
<th>Year</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>12.57 km²</td>
</tr>
<tr>
<td>2006</td>
<td>36.82 km²</td>
</tr>
<tr>
<td>2017</td>
<td>58.60 km²</td>
</tr>
</tbody>
</table>

Coverage: 12.57 km², 36.82 km², 58.60 km²
Built-up area in the state of Selangor (close to Kuala Lumpur)

Coverage:

- **1995**: 144.86 km²
- **2006**: 187.05 km²
- **2017**: 213.70 km²