SUSTAINABLE PORT

DEVELOPMENT IN WIO REGION

BY

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Large Scale Developments in WIO region

Port and the Environment
- Port-City Relations
- Effects on Environment

Objectives of the Proposed study

Port Development
- Traditional Port Development
- Ports of the Future

Scenario Modelling

Policy Recommendations
Large Scale Developments in the WIO Region

Large Scale developments along WIO coastlines ranging from:
- Ports
- Railways
- Roads
- Oil & Gas explorations
- Mining activities

The countries of the WIO are expected to enter into a period of rapid economic growth, enabled by their:
- Current low economic baseline
- Rapid demographic growth
- Access to new energy sources.

a) Kenya.
1. Port of Mombasa
   - 3 berths completed in Sep. 2016-550,000 TEUs
   - KSH35B phase II for Additional 450,000TEUs (230,320 and 350m)
   To handle Pannamax and Post Panamax Vessels
2. Lapsett Project- 32 berth port and other infrastructures (ongoing)

b) Tanzania
1. In July 2017 Dar es Salaam Maritime Gateway Project (DSMGP) was unveiled aiming to overhaul Port of Dar es Salaam’s infrastructure by 2023.
2. TradeMark East Africa is providing the TPA with technical support in the rehabilitation of access roads to help reduce traffic congestion.
3. Plans to build a dry port in the country’s western Kigoma region.

4. Phase I of 205-km rail between Dar es Salaam and Morogoro, is scheduled for completion by October 2019

c) Mauritius
1. Expanded Port Louis by dredging up to 16.5m
2. Mauritius Container Terminal constructed and Inland Container terminal is proposed.

d) Madagascar’s Toamasina Port Development Project (April 2017-April 2027).

e) Nacala Port in Mozambique is undergoing Rehabilitation and Expansion

f) Uganda is expected to ship its oil soon-maybe through Mombasa
Ports act as transfer hubs for trade and are intermodal systems where road, rail, pipelines and other transport modes meet for purposes of trade enhancement.

Investments in ports; Drivers
1. Increase in vessel sizes.
2. Cargo base expansion among other factors.
Challenges Facing Ports of Today

a) Increase in Cargo volumes
b) Challenge in cargo types
c) Changes in Vessel Fleets
d) Inland connections constrains
e) Changing physical conditions
f) Increased environmental impacts

Can be avoided by proper planning during port development and expansion as well as incorporating strategies to reverse environmental effects of existing port
OBJECTIVES

1. Overview on Ports and developed along the WIO Ocean region.
2. Audit on specific environmental effects of major ports of the WIO region.
3. Conduct scenario analysis and develop scenarios for port development and expansion along the WIO region.
4. Produce a Toolkit on development of green ports and highlight a mechanism for enforcement to provide support to governments for decision making in port development and expansion.
There is an unavoidable intersection with critical coastal and marine resources with huge potential to compromise the integrity of these resources because the resources are critical for the socio-economic development of the region since the economies are largely natural resource based e.g. tourism, fishing, farming, mining etc.

<table>
<thead>
<tr>
<th>Degradation of natural coastal landscapes</th>
<th>Changes to coastal processes</th>
<th>Degradation of water and sediment quality</th>
<th>Loss of public access and amenity</th>
<th>Degradation of marine heritage</th>
<th>Disrupting the relationship of people with the marine environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significant visual intrusion</td>
<td>Disruption of wave energy, currents and tidal flows</td>
<td>Discharge of sediment or pollutant-laden water</td>
<td>Restriction or exclusion of public access to parts of the coastal environment</td>
<td>Damage to the integrity of archaeological sites and other sites of historical significance</td>
<td>- Contamination of water and sediment</td>
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<td>Replacement of natural shapes and forms with hard lines and edges</td>
<td>Alteration of sediment transport regimes causing coastal erosion or sediment accumulation</td>
<td>Increased levels of rubbish, oil and antifoul paints entering the water, through increased use of an area</td>
<td>• Loss of amenity through increased noise, light and traffic</td>
<td>• Contamination of water and sediment</td>
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<tr>
<td>Disruption of natural coastal patterns and processes</td>
<td>• Habitat change</td>
<td>Through increased use of an area</td>
<td></td>
<td>• Loss of intertidal areas</td>
<td>• Loss of access to, or destruction of, culturally important sites</td>
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- Habitat change
• Direct loss of coastal habitat
• Disruption of sensitive and/or ecologically productive ecosystems and transition zones
• Damage to habitats of birds and intertidal fish and animals.
• Reduction in natural flushing, potentially leading to eutrophication
• Shading of areas of water resulting in the longer term loss of marine plants
• Removal of all marine life from parts of the seabed
• Permanent loss of slow growing, sensitive species which are unable to recover
• Release of sediment into seawater which reduces light penetration, disrupts juvenile species and filter feeders, and smothers benthic communities over a wide area
• Release of organic-rich sediments into seawater which can exacerbate algal blooms
• Release of metals, chemicals, organochlorines and PCBs into the marine environment
Port development will continue to impact on the marine ecosystems unless port capacity and efficiency can be shown to benefit more from sustainable port development than from traditional approaches.

**BUSINESS AS USUAL PORT DEVELOPMENT SCENARIO**

- Increase in profit (unsustainable)
- Short Term Results
- Long term Effect

1. Real wealth decrease
2. Habitat loss
3. Species loss
4. Severe decline in marine gross product.

Undermining achievement of the UN 2030 Agenda for Sustainable Development.
Let us reflect on this quote:

*This planet does not belong to the adults of today and should not be managed on the basis of short-term considerations of economic gain or political power. If the signatures of our children were needed to ratify decisions that affect their future, many of the destructive actions perpetrated today would certainly cease. Whatever we do, the ocean will survive in one way or another. What is more problematic is whether we shall preserve it in a state that ensures humanity’s survival and well-being.*

Federico Mayor, Director-General of UNESCO, 1998

Sustainability in port development and management is therefore an unavoidable concept that needs to be address urgently.
Sustainable Port Development

Aims to create scenarios for “Ports of the Future” which are green, sustainable and has minimal or no impact to the environment.

**Green Port Development**

- **BALANCE of:**
  - Economic growth + Port Community Welfare + Healthy Ecosystems

- Achieved by a look into:
  - Blue Economy Strategies in port’s influence area.
  - Innovative Port Governance.
  - Public - Private Partnerships.
  - Integration of Port-City socio-economic and cultural impacts
  - Green Energy Sources use
  - Synchronization and optimization of port operational processes
  - Strong environmental regulations

- Leading to:
  - Sustainable Port

1. Improved Air quality
2. Improved waste management
3. Real time monitoring of pollution sources
4. Real time monitoring of ecosystems
5. Improved Port Security
6. Sustainable Profits
7. Efficient port operations

By the use of:

- Advanced IT technologies
- Modelling and simulation tools
**Improved Air Quality**

- Replacing fossil fuel use by electric transportation at the ports and use of renewable energies.

- Equipping new and possibly also existing vehicles/machinery with oxidation catalysts and particulate traps, which may reduce emissions of CO, HC and PM by up to 90%.

- Calm driving (EcoDriving).

- Improve port logistics, reducing fuel consumption and pollutant emissions per goods unit handled

- Introduce and increase the supply and use of shore-side electricity (*regional approach*)

- Use of fuels with lower sulphur content (*by regulations* or voluntarily).

- Use of sulphur scrubbers (*by regulations* or voluntarily).

- Use of NOX reduction systems (*by regulations* or voluntarily).

- Use of particulate traps (*by regulations* or voluntarily).

**Improved Water and Soil Quality**

- Environmental friendly antifouling agents.

- Adequate reception facilities.

- Structurally sound oil transmission and containment equipment.

**Reduce Noise**

- Flood protection by Eco-engineering solutions.

**Benefits**

- Reduced inland transport costs

- Reduced operational expenses.

- Healthy Port environment

High investment costs hence there is need for a proper look at the financial viability.
Focus on Environmental Strategy in Port Development

Environmental Technologies

- New Equipment and Technology Introduction
- New and Renewable Energy sources
- Optimizing the routing of vehicles
- Sustainable building construction
# Sustainable Practices in Port Operation

<table>
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<tr>
<th>Regulatory Compliance</th>
<th>Societal Pressures (Resulting direct Economic Benefit)</th>
<th>Port Development and Planning</th>
<th>Operational Issues</th>
<th>Competitive Advantage (Gain)</th>
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<tr>
<td></td>
<td>-International Maritime and Environmental Legislation</td>
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<td></td>
<td>-National and Local Environmental Legislation (provincial, county, state)</td>
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<td>-Corporate and social responsibility</td>
<td>-Coastal Zone planning</td>
<td>-Operational Performance</td>
<td>-Competition between regional ports</td>
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<td>-Environmental protection and quality Improvement</td>
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<td>-Health and safety Issues</td>
<td>-Create/promote/gain green logistics</td>
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<td>-Economic Incentives</td>
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<td>-Process standardization</td>
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<td>-Environmental Management (pollution prevention)</td>
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Scenario Modelling

1. Financial and economic analysis (Cost and pricing).
2. Operational Analysis and Capacity Assessment.
3. Environmental Assessment and impact analysis.
4. Social cost benefit and value for money analysis

Formulation and Assessment of development scenarios

Models
- Flexible to incorporate change
- Make best use of existing port assets
- Allow for phased development to match demand
- Include port zooning to cover for both land and water areas—often by trade type
- Allow for future proofing of critical parameters

Policy Recommendations

Nairobi Convention to adopt an initiative of identifying a sustainable regional (WIO) development strategy for ports and harbors by;

1. Conducting scenario analysis for port development and expansion in the WIO region
2. Producing a toolkit for green port development for the WIO region

The green port toolkit will aim at providing guidelines for port development with limited impacts on existing ecosystems and maximizing social welfare.

The region will greatly benefit due to reduced ecological and environmental impact that are seen today in the traditional ports.
THANK YOU

Q & A