Environmental Issues Related To Port Activities

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Port Louis Harbour

Port Characteristics

*Terminal I*

- Consist of Quays A, D and E
- Trou Fanfaron Fishing Port

*Terminal II*

- Multipurpose Terminal consisting of Quays 1, 2, 3 and 4

*Terminal III*

- MCT 1 & MCT 2

*Other Facilities*

- Cruise Jetty
- Oil Jetty
- Bulk Sugar Terminal
- Mauritius Freeport Development
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Terminal I

Trou Fanfaron Fishing Quay I:
150 mts x 5.5 mts

Trou Fanfaron Fishing Quay II:
165 mts x 7.0 mts

Quay B: 135 mts x 40 mts
Black oil, inter-island trade, general cargo, passengers

Quay D: 170 mts x 12.2 mts
Black oil, wheat, maize, soya bean meal, molasses, edible oil, general cargo, passengers & inter-island trade

Quay A: 210 mts x 12.2 mts
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Terminal II – Multi-Purpose Terminal

Mauritius Freeport Development (MFD) Fishing Quay
115 mts x 9 mts

Quay No. 1: 123 mts x 12.2 mts
Black oil, white oil, fertilizers, talow

Quay No. 2: 180 mts x 12.2 mts
cement, coal, general cargo, containers

Quay No. 3: 185 mts x 12.2 mts
general cargo, containers

Quay No. 4: 185 mts x 12.2 mts
general cargo, LPG, containers, bitumen
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Terminal III – Mauritius Container Terminal

Port Louis: 2nd deepest container port in Sub-Saharan Africa capable of handling 5th generation container vessels

- Commissioned in 1999
- Quay length: 560 mts
- Dredged depth: 14.0 mts at quay, 14.5 mts in channel
- Turning basin: 450 mts diameter
- 5 post panamax quay cranes
- 288 reefer points
- Container scanner
- Terminal area: 27.5 H
- Container yard: 13 H
- Ethanol tanker also berthed
Port Louis Harbour
Environmental Issues At Port Louis Harbour

Port Control & Regulations

The Mauritius Ports Authority (MPA) established as landlord authority with powers to regulate environmental issues in the port.

Applicable Legislations

• Ports Act of 1998
• Port (Operations & Safety) Regulations

Other Legislations

• Environment Protection Act
• Coastal Water Quality Guidelines

International Conventions

• MARPOL, SOLAS etc
MARPOL Convention

The International Convention for the Prevention of Pollution from Ships (MARPOL) is the main international convention covering prevention of pollution of the marine environment by ships from operational and accident causes.

- The Convention includes regulations aimed at preventing and minimizing pollution from ships - both accidental pollution and that from routine operations - and currently includes six technical Annexes. Special Areas with strict controls on operational discharges are included in most Annexes.
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MARPOL Convention
Technical Annexes.

• Annex I Regulations for the Prevention of Pollution by Oil
• Annex II Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk
• Annex III Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form
• Annex IV Prevention of Pollution by Sewage from Ships
• Annex V Prevention of Pollution by Garbage from Ships
• Annex VI Prevention of Air Pollution from Ships (not yet ratified by Mauritius)
Environmental Management at MPA

• MPA certified to ISO 14001 Environmental Management System since 14.08.2015
• Quality and Environmental Policy adopted
• High Level Green Port Committee set-up
• Operational Arm: Marine Department- Headed by Port Master

Functional Units

  – Port Environment Unit : Preventive Role
  – Port Emergency Services : Reactive Role
Port Louis Harbour

Main Environmental Issues In The Port

- Oil Pollution
- Ballast Water
- Pollution from land based activities (floating debris & nutrient pollution)
- Hull Cleaning
- Ship generated solid wastes
- Dredging
- Biodiversity Conservation
- Climate Change
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Oil Pollution

• Includes illegal discharge of Slops, Sludge and bilge water
• Vessels not allowed to discharge in harbour waters
• Reception facilities available through licensed contractors (Virgin Oil, Eco fuel) to collect and treat such wastes
• Bunkering Activities
  – Requires Approval of Port Master
• Tanker/Barge/Bunkering Accidents
  – Activation of Port Louis Harbour Oil Spill Response Plan
  – Deployment of Oil Spill Equipment (booms, skimmers, sorbent materials etc)
• Polluter Pays Principle Applies
Environmental Issues At Port Louis Harbour

Oil Pollution
Environmental Issues At Port Louis Harbour

Oil Pollution (Contd)

Port Louis Harbour Oil Spill Response Plan

- Uses a Tiered Approach
  - Tier I
  - Tier II
  - Tier III

- National Oil Spill Response Plan
  Activated for large scale spills (may require international assistance)
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Ballast Water Management

• Ballast Water Convention Not Yet Ratified By Mauritius
• De-Ballasting not allowed in the harbour
• Port Operations at Port Louis involve mostly taking of ballast by ships

Port Baseline Survey carried out by Mauritius Oceanography Institute and Directorate of Shipping
Environmental Issues At Port Louis Harbour

Pollution from land based activities

• Floating Materials
  – Pollution of harbour waters by floating materials (mainly plastic bottles)
  – Risk of causing damage to propellers of vessels
  – Floating materials originate from the City and reaches the harbour through rivers and canals having their discharge in the harbour
  – Grids installed but ineffective due to risk of flooding

• Floating Debris Recovery Craft available at the MPA for the collection and disposal of floating debris
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Environmental Issues At Port Louis Harbour

Floating Debris Recovery Craft
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Pollution from land based activities

• Nutrient Pollution
  – Occurs mainly after heavy rainfalls
  – High level of Phosphates and Nitrates (indication of excessive fertiliser usage)
  – Monitoring of Harbour Water Quality done by Albion Fisheries Department
  – Sample collection and analysis also done by MPA as part of the requirements of Environmental Monitoring Plans of port projects
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Hull Cleaning

• Hull cleaning activities have a high risk of introducing Marine Invasive Species in the local marine ecosystem causing irreversible damage

• MPA has adopted a new policy on this issue – To favour clean technologies

• Clean Technologies are those that can *capture* and *destroy* the macro and micro organisms

• One Hull Cleaning Operator has been granted permission to use a clean technology

• Other hull cleaning operators have been given a moratorium period of one year to switch to similar clean hull cleaning technologies
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Ship Generated Solid Wastes

• In line with MARPOL Annex V the MPA provide solid waste reception facilities to ships calling at Port Louis
• Waste Contractor Appointed by MPA
• Vessels charged as per Port Fees Regulations.
• Waste collection and disposal from ships have specific sanitary / health / environmental requirements
• Incinerator Operational in the Port near Fort George) by the Plant Protection Office for disposal of Food wastes and Quarantined wastes (Funded by MPA)
• Port Waste Management Plan under preparation
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Dredging

• Removal of sediments and debris from the bottom of harbours to increase depth of navigation channels, anchorages, or berthing areas to ensure the safe passage of boats and ships.

• It is a routine necessity because of sedimentation - the natural process of sand and silt washing downstream.

• Dredging Operations being carried out Port Louis Consist of increasing the chart datum at MCT from 14.5 to 18.0 m and from 14.5 to 16.5 m along the English Channel.
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Dredging - Environmental Controls

• Subject to an EIA Licence supported by
  – Hydrodynamic and wave modelling
  – Sediment Transport Analysis
  – Baseline survey of subtidal benthic species and communities.
• Installation of silt screens during dredging works
• Constant Monitoring of water and sediment quality, suspended sediment and turbidity
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Biodiversity Conservation

Major Conservation Challenge In The Port:

• The **Rivulet Terre Rouge Estuary Bird Sanctuary** is visited every year by about 1200 migratory birds

• Protected under RAMSAR convention

• Classified as a sensitive area in the port

• Set back distances respected

• Link road from port to Jin Fei will not pass across the site
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Biodiversity Conservation (contd)

Major Conservation Challenge In The Port:

• MPA has assisted in the upgrading of the bird sanctuary site:
  – Construction of a pathway and kiosk
  – Installation of Lamp posts operated by solar panels
  – Upgrading of perimeter fencing
  – Rehabilitation of bird hide

• Management Plan of the site prepared by BIOTOPE (French Consultacy firm specialised in conservation projects of sensitive ecosystems)
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Biodiversity Conservation (contd)

Reef Conservation

• The MPA has on several occasions scuttled idle vessels to serve as artificial reefs
• Idle vessel TAWARIQ was sunk in the North Western region of the island about 2 km from the coast line of Trou Aux Biches at a depth of about 30 m to allow regeneration of the marine ecosystem in the area.
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Climate Change

• Vulnerability of Mauritius as a SIDS recognised by the UN (Earth summit, Brazil 1992)
  – Complemented By The Mauritius Strategy of Implementation (MSI) of 2005.

• Mauritius exposed to a large range of impacts from climate change (e.g. sea level rise) and potentially more frequent and intense natural disasters

• According to World Risk Report 2014 Mauritius is ranked as
  – 14th country with highest disaster risk
  – 7th on the list of countries most exposed to natural hazards
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Climate Change

International Panel on Climate Change (IPCC) Report 2007

- **Temperature**
  - Average temperature rise: 0.74°C – 1.1°C (1961-1990 mean)
  - Projected to rise by 2°C by 2061-2070

- **Sea Level Rise**
  - Sea level rise of 1.5 mm/yr at Port Louis (1950 – 2001)
  - Mean sea level rise of 2.1 mm/yr (1987 – 2007)
  - Projected to reach 1.0 m for southern oceans.
  - Latest figures from the University of Hawaii indicate a mean sea level rise of 5.6 mm/yr
Sea Level Rise At Port Louis

Source: Ministry of environment
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Climate Change

Vulnerability of Port Louis

Port Louis Harbour is exposed to a combination of risks:

- Sea level rise
- High swells
- Strong wind gusts
- Storm surge
- Rapid intensification of cyclones
- Flooding

Estimated losses due to bad weather at National Level

2013 - Stoppage of operations for 21 days – losses amount to Rs 3.9 Billion
2014 – Stoppage of operations for 10 days – losses amount to Rs 1.9 Billion

(source: MPA/MEXA)
Flooding at Mauritius Container Terminal

Source: Mauritius Ports Authority
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Climate Change - Adaptation

- Preliminary Technical Study and Design of an Island Terminal and Breakwater Structure at Port Louis Harbour
- Flood wall erected at Mauritius Container Terminal
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Climate Change - Adaptation

New Port Master Plan Prepared (2015-2040)

Main Recommendations:

- Construction of an island terminal with 2 km break water
- Construction of a barge jetty
- Break water at Fort Williams
- Break water at Caudan basin
Breakwater and Container Terminal – Long Term

- Construction of 2 km breakwater
- Dredged depth: 18 m
- Reclaimed land: 60 Ha
- Container Terminal
- Quay length: 1 km
- Container yard: 40 Ha
- Throughput capacity: >1 M TEUs
- Estimated costs: US$ 303 M/ Rs. 10 Billion
A “Climate Change Vulnerability and Adaptation Study for the Port of Port Louis” is underway with the technical assistance of the Climate Technology Centre & Network (CTCN)

Main Components of the Study:
- Review existing national plans and strategies directly or indirectly related to the port sector in the context of climate change.
- Undertake a location-specific climate risk assessment for the Port of Port Louis, both land-based and sea-based,
- Formulate an action plan for the implementation of adaptation options
- Identify capacity building needs of engineers, marine personnel and other cadres of the port sector.
- Recommend appropriate construction standards, codes, specifications and climate-resilient legislations for the port infrastructure and develop adaptation guidelines to assist the port authorities.
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Climate Change Adaptation (contd)

Expected Outcome of study:
(i) Enhancing the resilience of our port infrastructure
(ii) Ensuring that climate changes are incorporated in future design specifications.
(iii) Mitigating the impact of climate change through proper planning.
(iv) Enable more targeted investment in technology and equipment that will adapt to future climate changes.
(v) Identifying areas where upgrading of infrastructure including port facilities, storage areas and navigation systems are required.
(vi) Identifying risks that can not be mitigated and need to be outsourced to a third party.
(vii) Ensuring that emergency preparedness and response plans include specific risks related to climate change and related to port operations.
Thank You