



MARINE POLLUTION — THE SHIPPING DIMENSION

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OUTLINE

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INTRODUCTION

FOOD FOR THOUGHT

“Let us not flatter ourselves over much on account of our human conquest over nature. For each such conquest takes its revenge on us.”

... FREDERICK ENGELS

INTRODUCTION CONT'D

MIRACLE OF THE KORAN: OCEANS COVERAGE OF THE EARTH

“Land is mentioned in Koran 13 times and Sea is mentioned 32 times.”

TOTAL = 45

$$\frac{32}{45} \times 100 = 71.11 \%$$

$$\frac{13}{45} \times 100 = 28.8 \%$$

BLUE ECONOMY 6TH OR 7TH

INTRODUCTION CONT'D

HISTORY OF OCEANOGRAPHY

“Where are your moments, your battles, martyrs ? Where is your tribal memory? Sirs, in that grey vault. The sea locked them up. The sea is history.”

... DEREK WALCOTT

INTRODUCTION CONT'D

MULTIPLE AND VARIED USES OF THE SEA

History of Natucket

“In the year 1690 some persons were on a hill observing the whales spouting and sporting with each, when one observed there pointing to the sea is a green pasture where our children’s grand children will go for bread .”

... OBED MACY

Concentration of what we can get from the oceans

DEFINING MARINE POLLUTION

- In 1839 Lin Zexu, who had been sent to Canton to wipe out the Opium trade confiscated 20,000 chests of Opium from the British traders. He adulterated these with salt and lime. As he was dumping these into the sea, he consigned the narcotic cargo to the spirits of the sea with a prayer
- “You who have washed away all stains and cleanse all impurities... poison has been allowed to creep in unchecked till barbarian smoke fills the market; tell the creatures of the water to move away for sometime to avoid being contaminated.”
- “Wrong amount of the wrong substance at the wrong place and the wrong time.”

DEFINING MARINE POLLUTION CONT'D

- GESAMP's DEFINITION

“The introduction by man either directly or indirectly of substance or energy into the marine environment including estuaries, resulting in such deleterious effects as harm to living resources, hazards to human health, hindrance to marine activities (including fishing), impairment of quality for use of sea water and reduction of amenities”

- UNCLOS

“The introduction by man, directly or indirectly of substances or energy into the marine environment, including estuaries, which results or likely to result in such deleterious effects as harm to living resources and marine life, hazard to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities.”

MAJOR MARINE POLLUTANTS

- Oil
- Sewage
- Pesticides and other persistent organic chemical
- Heavy metals
- Radioactivity

MAJOR MARINE POLLUTANTS CONT'D

❖ OIL

○ SOURCES

- Offshore production
- Routine ship operations
- Ship accidents
- Land-based sources
- Natural sources

○ EFFECTS

- Beaches
- Plants (kelp, sea grass , mangroves)
- Animals (birds, fish, mammals)
- Humans (loss of income, closure of marinas, harbours, tourist beaches, fishery)

MAJOR MARINE POLLUTANTS CONT'D

❖ SEWAGE

- BOD
- Sewage Treatment
- ill effects
- Biblical solution
 - Deuteronomy 23: 12-13

MAJOR MARINE POLLUTANTS CONT'D

❖ PESTICIDES AND OTHER PERSISTENT ORGANIC CHEMICALS

- Halogenated hydrocarbons (DDT & PCB)
- Toxicity, Persistence and bioaccumulation
- DDT & Predatory birds
- PCBs & infertility in seals and sea lions

MAJOR MARINE POLLUTANTS CONT'D

❖ HEAVY METALS

- Mercury
- Cadmium
- TIN
- Lead

MAJOR MARINE POLLUTANTS CONT'D

❖ RADIOACTIVITY

- Natural Input
- Artificial Input
 - Atomic weapon testing
 - Other military activities
 - Nuclear waste from nuclear fuel reprocessing plants
 - Low-level radioactive waste dumped at sea
 - Loss of nuclear powered submarines
 - Explosion at nuclear reactor sites

OTHER MARINE POLLUTANTS

- Solid Waste
- Dredge Spoil
- Garbage
- Waste Heat

SOURCES OF MARINE POLLUTION

- Direct out fall
- River inputs
- Shipping
- Offshore
- Atmosphere

SOURCES OF MARINE POLLUTION CONT'D

❖ DIRECT OUT FALLS

- Estuaries
 - Parts (centers of population)
 - Urban and industrial wastes
- Coastal Towns
 - Untreated municipal waste
 - Fouling of local beaches
- Coastal Industries

SOURCES OF MARINE POLLUTION CONT'D

❖ RIVER INPUTS

- Organic waste
- Pesticides and Fertilizers
- Petroleum and Oils waste from roads
- Generally all land-based material washed off by rainfall

SOURCES OF MARINE POLLUTION CONT'D

❖ OFFSHORE

- Dredge Spoil
- Sewage sludge
- Offshore industrial activities

SOURCES OF MARINE POLLUTION CONT'D

❖ ATMOSPHERIC INPUTS

- Discharges through rain, fallouts or particulate matter
- Dissolution at the sea surface
- Metals (Lead, Mercury)

SOURCES OF MARINE POLLUTION CONT'D

❖ SHIPPING

- Accidents
- Routine operation

SHIP-BASED MARINE POLLUTION

❖ SHIP ACCIDENTS

- Torrey Canyon
- Amoco Cardiz
- Exxon Valdez
- Castello De Belver
- ERIKA
- Prestige

SHIP-BASED MARINE POLLUTION CONT'D

❖ ROUTINE OPERATIONS

- Bilges/chemicals/biocides
- Garbage & sewage
- Physical & other damages
- Emissions
- Noise

SHIP-BASED MARINE POLLUTION CONT'D

❖ INTERNATIONAL LEGISLATION

- Role of Shipping
- Limitation and Constraints
- Problems of implementation

INTERNATIONAL LEGAL REGIME

❖ Examples of Legislations

- UNCLOS
- MARPOL
- AFS
- OPRC
- Intervention Convention
- BWM
- SOLAS
- STCW
- CLC
- FUND

CONCLUSION

- Marine Environmental psychologist
- Programme Development
- RMU's Example
- Disaster- Reactive Syndrome
- Management of Perception