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MARINE POLLUTION—EFFECT AND MANAGEMENT

Introduction

The chilling prophecy made in the lines of the poem *Archy and Methitable* that, 'man is making deserts of the earth/it wo'nt be long now/before man will have it used up/so that nothing but ants and centipedes and scorpions/can find a living on it'¹, by the poet Donald Marquis is not at all an extreme view when we truly realise what disaster the world is facing at the turn of 20th century. Today the alarm bells are ringing world wide with the message that since man has created his doom by destroying the precious ecological balance, it is the man upon whom rests the duty to stop or slow the process of destruction of 'Earth', the only planet where life can survive.

The protection of global environment has become an issue of international concern only in recent years but it reached its peak from mid-eighties particularly in the year 1989 following certain catastrophes with grave ecological implications viz, nuclear disaster in Chernobyl, Exxon valdez oil spill, floods in Bangladesh, drought in the United States, acid rain in the Polish-Czechoslovak border, creation of hole in the ozone layer over Antarctica etc. Hence an observer writes, 'If historians remember 1989 as the year the Iron

1. Thomas A. Sancton, *Time*, January 2, 1989, p-18.

Curtain collapsed it has also been the year that concern for the environment reached a new peak.² Although assault to nature has been going on for a long time particularly since the dawn of industrial revolution, reverse action from nature in the last few years have worked as a powerful catalyst for world wide public opinion. Everybody suddenly sensed that this gyrating globe, this precious repository of all the life that we know of was in danger.³

Protection of environment today is a universally recognised fact but the question remain as to the problem of 'how much' and 'how'! Moreover environment is one thing which affects everyone irrespective of land and sea-boundary between nations. Therefore, protection of environment requires world wide collective effort. Effective action to halt the massive injury to environment shall require mobilization of political will, international cooperation and sacrifice to an extent unknown except in war time. Moreover, since each state is the supreme actor within its own boundary, effective control and protection shall require utter effort and sincerity at the national level, to stop environmental disaster within each country. Thus it shall involve the control of political, legal, commercial and economic system of the countries of the world which legitimized the environmental assault through such activities in the first place. Mostafa Tolba, the Executive Director of UNEP said 'Addressing the global environmental crisis requires nothing less than a radical change in the conduct of world policy and the world economy.'⁴

For proper management of environment, we have to identify those areas which poses serious problems. Among the various environmental crisis, environmental pollution is one. It has been defined as 'The introduction by man into any part of the environment of waste matter or surplus energy, which so changes the environment as directly or indirectly adversely to affect the opportunity

2. *Ibid*, December 18, 1989, p.36.

3. *Ibid*, January 2, 1989 p. 17.

4. *Ibid*, December 18, 1989, p.37.

of men to use or enjoy it.⁵ Ocean pollution is one area in environmental pollution. A rational and acceptable definition of water pollution is the presence of substances in water in such quantities and of such quality that the water's value to other users is unreasonably impaired. The Stockholm Declaration has defined marine pollution as 'the introduction by man directly or indirectly of substances 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 as seawater and reduction of amenities'⁶. Ocean is one which belongs to no one and to everyone. It is the common heritage of mankind. "It is above all at the edge of the sea that the pretension of sovereignty ceases and the fact of a shared biosphere begins more strongly with each passing decade to assert its inescapable reality⁷." Therefore common endeavour is necessary to retain in the healthy marine environment more than any other areas of environment.

In this paper, an attempt has been made to evaluate the importance of Ocean in our life, a short assessment of how Ocean is being polluted together with its implication and how this problem can be managed nationally, regionally and internationally.

I

Oceans : Their Pollution and Implications

In the Earth's wheel of life, the Ocean provides the balance.⁸ Ocean covers an area of 361 million square kilometre i.e. 70.8% of

5. Cited by C.V. Cole and Mahesh Chand, "Water Pollution Control—A Need of the Day", in *Legal Control of Environmental Pollution*, S. L. Agarwal (ed), (Bombay : N.M. Tripathi Pvt. Ltd, 1980) p-32.
6. U.N. doc. A/CONF. 48/8. pp. 78-79.
7. Barbara Ward and Rene Dubos, *Only one Earth* (New York: W. W. Norton, 1972), p. 203.
8. World Commission on Environment and Development, *Our Common Future* (New York : Oxford University Press, 1987) p. 262.

the total surface of the earth. It constitutes almost 98.8% of the hydrosphere and plays a critical role in maintaining earth's life support system. Acting as a huge heat reservoir, it moulds out climate ironing out the extremes of temperature that would otherwise prevail over the earth, creating deserts and frozen wastes.⁹ Ocean provides a major source of food, rich mineral resources both in the form of hard and liquid. It is the energy house of unlimited potential. Still today, Ocean provides the cheapest and convenient means of transportation. It helps earn huge income from the industry of tourism.

Ocean which so far viewed to everyone as a vast stretch of water capable of absorbing everything and anything into their midst is no longer so. Neglect and disregard for the mighty Ocean caused us to dump today, an astonishing 20 billion tons of garbage and waste including oil, toxic chemical, nerve gases, radioactive industrial wastes etc into the vast arms of the sea. All these add up not only to tremendous assault on the livelihood of millions of people but also causing irreparable damage to the marine environment, thus disrupting the valuable ecological balance.

The major source of contemporary marine pollution, accounting for up to 80% of all pollution, is land-based activities such as industrial discharges, factory effluents, agricultural wastes and sewage.

Oil spill, either accidental or operational is another source of Ocean pollution. Today, oil is the major source of fuel for Ocean-going vessels, but it is the vast expansion in world energy consumption and in oil as the primary source of that energy that has led to the tremendous increase in the transport of oil by sea, hence dramatic rise in maritime pollution. On 16 March, 1978, the supertanker M/T Amoco cadiz grounded off the coast of Brittany (eight miles north of the island of Ushant) resulting the discharge of the entire cargo of 210,000 tons of crude oil and 4,000 tons of bunker

9. Howard Brabyn, "The Sea Deserves All Protection", *The Observer*, August 10, 1989.

fuel.¹⁰ The explosion of French tanker *Belelgeuse* in Bantry Bay in the Irish Republic on 8 January 1979 unloaded about two thirds of its cargo of 120,000 tons of crude oil.¹¹ The Exxon Valdez disaster which poured 10 million (260000 bbl) of oil in Prince William Sound in Alaska on March 1989 causing oil slick that covered 1600 sq mile of water, fouling 800 miles of shoreline, killing thousands of wildlife, is a remainder to mankind that development in science and technology cannot always prevent disasters which may ultimately cost our survival. Cleaning of Exxon mess involved so much labour and money that a company executive said, 'we could invade a small country with what we have deployed here.'¹² But only 61,000 bbl of oil could be recovered and the rest 199,000 bbl of oil speeded irretrievably into the ecosystem. The Alaska tragedy shows that no amount of money and finger pointing can compensate for a disaster on a scale of the Exxon Valdez spill. Once the oil got away, there was no way to clean it all up.¹³ Even the once inaccessible Continent, Antarctica could not escape human assault as the scientists in the name of research continuously causing pollution to the environment. The careless behaviour to this Continent is evident in the 'Bahia Paraiso' incident, an Argentine ship, which ran aground and sank in January 1989 and apart from the spill of a nominal 70,000 gallon of diesel fuel, it continued to leak indefinitely. What is astonishing is that no one is responsible under international law for cleaning up the Bahia Paraiso spill.¹⁴

Dumping of toxic wastes is a major source of pollution. In March 1975, the Finnish tanker 'Enskeri' planned to dump a cargo of waste including several tons of arsenic trioxide in the South Atlantic. But at last it could not successfully do so because the fact became known and being subject to strong criticism the ship

10. R. P. Barston and Patricia Birnie, "The Marine Environment" *The Maritime Dimension*. (London : George Allen Ulwin, 1980), p. 118.

11. *Ibid.*

12. *Time*, May 8, 1989, p. 42.

13. *Ibid.*

14. *Newsweek*, October 23, 1989, p. 18.

subsequently returned to Finland with the waste cargo. Although this attempt failed, but the attempt made by the ship 'Pelicano' (1986) was successful which dumped 14,000 tons of toxic incineration ash off the coast of some third world countries in the Indian Ocean—a stark symbol of the environmental exploitation of poor countries by the rich.¹⁵ In the past two years, some 3 million tons of hazardous waste have been transported from the US and western Europe on ships like the Pelicano to countries in Africa and Eastern Europe.¹⁶

Ocean dumping and oil spill contribute to the larger problem of Ocean pollution, which not only cause health hazard but destroys the fragile balance of ecosystem. Although oil may seem apparently harmless but oils are complex collections of compounds some of which are toxic and kill organisms while others alter the biological characteristics and behaviour of organisms in a variety of ways. Among the four type of oil usually discharge from vessels (crude oil, Bunker fuel oil, diesel fuel oil and light petroleum products e.g. gasoline, kerosene), diesel fuel oil has been described as the worst in terms of toxicity. The effect of discharges are also influenced by factors like the biota of the area, local conditions such as temperature, currents, winds and the extent of existing pollution, the volume and concentration of the oil discharged and whether the location of the spill is in the open Ocean or more enclosed bodies of water.¹⁷ These factors strongly affect the 'weathering' processes which gradually remove the oil spill from the environment.¹⁸ For instance, high temperature means that evaporation of certain fractions of the oil will be fast. In contrast, spillage in Arctic areas could last for decades.¹⁹

The effect of oil pollution on marine life is disastrous. Rich estuarine or other breeding areas are extremely vulnerable, as has

15. John Langone, "A Stinking Mess, *Time*, January 2, 1989, p. 32.

16. *Ibid.*, p.34.

17. M Gonigle and Zacher, "The International Problem of Oil Pollution," *Pollution, politics and International Law* (London : University of California press, 1979), p. 33.

18. *Ibid.*

19. *Ibid.*

been depressingly demonstrated by the 'Amaco Cadiz' disaster. Unofficial reports of that spill indicate that it may have eradicated one of France's most highly prized seabird sanctuaries in the Sept Isles archipelago at a time when its bird population (particularly the puffins) was just beginning to show signs of recovery from the 'Torry Canyon' spill a decade earlier.²⁰ It has been estimated that chronic oil pollution in the North Sea and North Atlantic alone kills a staggering total of between 1,50,000 birds every year.²¹ A GESAMP (Joint Group of Experts on the Scientific Aspects of Marine Pollution) report stated that 'some sea bird populations have suffered from oil pollution to the extent that certain species or subspecies are threatened with extinction.'²² The Torrey Canyon spill killed between 40,000 and 100,000 waterfowl.²³ Exxon Valdez spill caused the death of 984 Sea otter and 35,000 birds.²⁴ Fishes are also sensitive to pollution specially light refined oil. After the West Falmouth spill of 160,000 gallons of refined oil, an oceanography survey within three days found 95% of its catch dead.²⁵ Although the stock may eventually recover but the recovery process is slow and full recovery can not be assumed.

Similar to oil pollution, dumping of wastes also has adverse effect on the marine life and health of Ocean viz, killing or retarding of growth, vitality and reproductivity of marine organism due to toxic pollutant; reduction of dissolved Oxygen necessary for marine life due to increased Oxygen demand from organic decomposition of wastes; biostimulation by nutrient rich waste, causing excessive blooms of algae in shallow waters of estuaries, bays, and parts of the continental shelf resulting in depletion of Oxygen and subsequent killing of algae that may wash up and pollute coastal

20. *Ibid*, p. 34

21. *Ibid*.

22. *Ibid*, p. 35.

23. *Ibid*.

24. *Time*, September 25, 1989, p. 40

areas; and habitat change caused by waste disposal practices that subtly or drastically change entire marine ecosystem.²⁶

The result of land based activities is the near destruction of Baltic sea, a dumping ground for industrial wastes from Poland, East Germany and Lithuania.²⁷ The river Daniub which acts as boarder among different states from West Germany to Romania is a major source of pollution to the Black sea since the river carries nitrogen run-off of agricultural fertilizer and discharges of plants along its bank.²⁸ A poisonous chemical soup, the product of coal mines and metal smelters roils Polish waters in the Bay of Gdansk.²⁹

Thus the oil pollution and waste dumping not only directly kills the marine population, but indirectly destroy them through the destruction of food chain or the water character. Even in the Antartic the entire population of seal and penguins may face extinction because of the rate of death of 'Krill', their staple food, due to increased pollution of water. 'Bahia paraiso' incident killed countless Krill population. The Exxon Valdez spill caused 25% reduction in the amount of Zooplankton which is a fundamental link in the food chain in Alaska Sea.³⁰

Major impacts on people and society caused by marine pollution include the following : production of public health hazard caused by marine organisms, transmitting disease to people; loss of visual and other amenities as beaches and harbours become polluted by solid waste, oil and other materials (the beaches of the Mediterranean, North sea and the English Channel are nearly closed because of pollution); the economic loss caused in a different

25. M Gonigle and Zacher, *op. cit.*, p. 35.

26. Edward A. Kellar, "Waste Disposal", *Environmental Geology* (Columbus, Ohio : Charles E. Merrill Publishing Co., 1979), p. 252.

27. *Time*, April 9, 1990, pp.40-45.

28. *Ibid.*

29. *Time*, January 2, 1989, p.32

30. *Time*, May 8, 1989, p.42

way viz, the reduction in tourism and finally the cost of cleaning the mess. The cleaning up of Mizushima (Japan) oil spill costs \$2000 million for Canada.³¹ The Exxon clean up took about \$ 1 billion. The worst effect of marine pollution will be the raising of sea-level. The increased rate of pollution in the Antarctic shall increase the capacity of polar ice to absorb more heat which shall ultimately result in melting the ice, hence causing huge supply of water in the Ocean. The coastal areas of the world would be subject to extinction.

What is important to remember is that marine pollution affects not only the place where pollution occurred but the entire mankind and Oceanic life and is likely to destroy the delicate balance between life and ecosystem.

II

Managing the Marine Pollution

Man's struggle to extend national sovereignty over the Ocean is of long standing nature, the outcome of which is that 35% of the Ocean surface today is brought under national control with regard to management of natural resources. Only the High Sea outside the territorial sea (12 nm from the low tide elevation) and EEZ (200 miles) are truly 'commons'. But pollution, fish species and other effects of economic activities do not respect legal boundaries and affects life beyond these. In the High sea where the traditional freedom as per Grotious's concept ("The immense, the infinite, bounded by the heavens, parent of all things perpetually supplied neither seized nor enclosed),"³² still remains, pollution

31. C. W. Nicol, *The Mizushima Oil Spill—A Tragedy for Japan and a Lesson for Canada*, Cited by M. Gonigle and Zacher, *op. cit.*, p. 35.

32. Hugo Grotious, *Mare Liberum*, (New york: Oxford University Press, 1966) p. 37.

occurred recklessly to the helpless environment as 'no mans land'. But the effects are today reaching beyond the 'free sea' to the doorstep of individuals. Ocean which provides balance in the delicate ecosystem is now under threat because of over exploitation, pollution and landbased development. If we want to avoid quick destruction of the planet earth and its fragile ecosystem we should initiate instant effort towards managing the Ocean. Since economic activities geared by scientific and technological development is the source of all pollution, schemes should be taken, if not for survival but for 'sustainable development. For this purpose the 'World Commission on Environment and Development, in its report, 'Our Common Future' has divided the entire Ocean in five areas.³³

1. Inland areas, which affect the Oceans mostly via rivers;
2. Coastal lands—swamps, marshes and so on—close to sea, where human activities can directly affect the adjacent waters;
3. Coastal Waters: estuaries, lagoons, and shallow waters generally—where the effects of land-based activities are dominant;
4. Offshore waters, out roughly to the edge of the continental shelf ;
5. High Seas, largely beyond the 200-mile EEZs of coastal state's control.

Three imperatives lie at the heart of the Ocean management question.³⁴

1. The underlying unity of the Oceans requires effective global management regimes.
2. The shared resource characteristics of many regional seas make forms of regional management mandatory.
3. The major land-based threats to the Oceans require effective national actions based on international co-operation.

33. World Commission on Environment and Development, *op. cit.* p-262.

34. *Ibid*, p. 264.

A. International Effort, UN Contribution and Law of the Sea:

The sense of 'Oneness' of the environment has prompted international effort but it is only a recent phenomenon. First international initiative was taken by the League of Nations and some governments during 1920s and 1930s to conclude an interational convention to control ship pollution but it could not gain much response. In the late '40s and 50s' the United Nations Transport and Communication Commission begun discussion for a possible treaty to control oil pollution of the Oceans, the outcome of which was the convening of Convention by Britain in 1954, which marked the beginning of International Environmental Regulation.

But the control of Ocean pollution remained more or less a matter of theory till the late 60s when the entire world was shocked by the impact of the oil spill caused by the grounded Liberian Super tanker 'Torry Canyon' which poured 120,000 tons of heavy crude oil into a hundred miles of British and French coastlines.³⁵ The world became aware of the fact that 'what previously could only be grasped intellectually : the earth is indeed small, lovely, unitary, finite and vulnerable.'³⁶

The significant step taken by the UN was the establishment of the agency called IMCO (Intergovernmental Maritime Consultative Organisation) in 1958 mainly for the purpose to control vessel-source pollution by developing rules and practices concerning the technical aspects of international shipping and encouraging the adoption of the highest practical standards for maritime safety and efficient navigation. The 1954 Convention for the prevention of pollution of the Sea by oil, though entered into force before the IMCO Convention, but its administration was taken over by the later. In 1973 IMCO adopted an International Convention for the Prevention of Pollution from Ships (MARPOL) which covers all

35. M Gonigle and Zacher, "The Nature of the Challenge", *op. cit.*, p. 5.

36. *Ibid*, p. 6.

forms of pollution from ships except dumping of wastes. The 'Torry Canyon' disaster in 1967 led in 1969 to the conclusion of Convention Relating to Intervention on the High Seas in cases of Oil Pollution Casualties, enabling coastal states to take action in defined circumstances against foreign vessels on the high seas which have become maritime casualties.

Dumping at sea of toxic wastes generated on land, specially radioactive wastes and redundant nerve gases, led to such international protest that in 1972 two Conventions were adopted viz Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft, Oslo and Convention on the Dumping of Wastes at Sea, London. Both institute a system of annexes into which pollutants are graded according to their harmfulness. Highly dangerous one are prohibited from being dumped in any circumstances; others can only be dumped on certain conditions under special permits, the rest can be freely dumped. In 1974 the North Sea and North Atlantic states concluded the 'Convention for the Prevention of Marine pollution from Land-based Source' in Paris to prevent and control pollution from these sources, categorising pollutants under annexes as in the Dumping Conventions.

Apart from the above the important conventions Concluded at the international level are the International Conference on Marine Pollution 1973, Convention on Civil Liability for Oil Pollution Damage 1969, The International Convention for the Establishment of International Fund for Oil Pollution Damage 1971 etc.

Instead of concluding numbers of international Conventions, the problem remained that these were not obligatory on the states to adopt. Moreover these conventions did not cover the land-based sources of marine pollution or pollution caused due to deep sea-bed operations. Apart from these, problem also remained as there was lack of a generally accepted framework or structure of legal principles capable of dealing with the full range of marine pollution problem and defining comprehensively and with greater particularity the

powers and duties of states, in all matters of marine environmental protection.³⁷

Recognising such inadequacies of existing laws, UN convened the conference on Human Environment at Stockholm in 1972 which recommended states to accept and implement existing instrument on the control of pollution and dumping at sea and to participate in new efforts to bring all sources of marine pollution including land-based sources, under appropriate controls.³⁸ To carry out the recommendation of UN, it created UNEP (United Nations Environment Programmes) which inspired various agreements at the regional level, but UNCLOS III (United Nations Convention on Law of the Sea) so far has been the most extensive document to deal with the protection of marine environment. It tried first of all to create a general duty to regulate all sources of pollution; secondly, to redistribute and redefine the balance of prescriptive power and duties between coastal and flag states, and finally, to control the content and standard of those regulations.

a. Duty to protect marine environment

Article 192 and 194 of UNCLOS III impose duty in general to protect and preserve the marine environment and to take all necessary measures to prevent, reduce and control pollution and Art. 207-212 impose obligation to adopt laws regulations and to establish international, global and regional rules and standards. The Convention does not specify precisely the content and extent of the laws and regulations to be adopted, but proceeds indirectly through rules of reference which indicate a minimum standard for legislation. Thus, flag states regulation of vessel pollution must "at least have the same effect as that of generally accepted international rules and standards established through the competent

37. Alan E. Boyle, "Marine Pollution under the Law of the Sea Convention", *American Journal of International Law*, (Vol. 74, April 1985), p. 348.

38. *Ibid.*, p. 349.

international organization or general diplomatic conference" (Art-211,2) ; seabed operation laws must be "no less effective than international rules, standards and recommended practices and procedures" (Art 208,3); and dumping regulations must be "no less effective than the global rules and standards" (Art-210,6). Therefore the state is free to set higher standards should it choose to do so, but international or global rules provide the starting point for at least what it must do.³⁹

b. Power of the coastal state

Art 17 of the Convention of the Territorial sea and Contiguous zone required foreign ships exercising the right of innocent passage to comply with the laws of the coastal states in so far as these were in conformity with the Convention and other rules of international law and did not hamper innocent passage. The Convention retains the basic preference for national rules and standards in the territorial sea and allows the coastal state to adopt its own pollution discharge rules for foreign vessels. But the legislation should not hamper, deny or impair the right of innocent passage; vessel causing pollution will only cease to be innocent if the pollution is willful and serious. But the coastal state has no power to regulate the design, construction, manning and equipment of foreign ships unless such rules give effect to generally accepted international rules and standards (Art 21, 2).

In the EEZ, the coastal state has jurisdiction over the protection and preservation of marine environment but the regulation should conform and give effect to generally accepted international rules and standard through the competent international organization or general diplomatic conference e.g. the Marine Pollution Convention-1973.

c. Enforcement jurisdiction

UNCLOS III has imposed on states an obligation to enforce regulations on all sources of pollution. It extends on the one hand

39. *Ibid*, p. 354.

coastal states powers in certain respects and on the other, gave a much greater role to the port state. The coastal state can investigate, arrest and prosecute vessels in the territorial sea for violation of pollution laws under Art 220, 2 which is subject to the right of innocent passage. In the EEZ the coastal states powers are graduated according to the degree of harm threatened. Coastal state may undertake, arrest and prosecution only when pollution causes or threatens 'major damage' to the coastal state under Art-220 (6); Unless there is substantial discharge causing or threatening 'significant pollution' to the coastal state, the coastal state may only require information about the identity of the ship and its next port of call-(Art-220, 3).

The port state under UNCLOS III is empowered (apart from investigation and prosecution of any violation of applicable rules in its territorial sea and EEZ) to investigate and prosecute pollution discharge violation on the high seas on its own initiative or within the jurisdictional zone of other states only if requested by the coastal or flag state concerned (Art-218, 2).

Flag states no longer enjoys the exclusive jurisdiction over offences on the high seas. It is subject to the laws of the port state and in some cases the laws of coastal states; but a limitation is imposed here that the flag state may take over the proceeding itself except in cases of major damage to the coastal state (Art-228, 1), but it does not apply to coastal states proceedings for territorial sea offenses or port state proceedings for offense in the port state's own territorial sea or EEZ.

d. Responsibility and liability

The Convention provides that states are responsible for fulfilling their international obligations concerning the protection and preservation of the marine environment (Art-235, 1); States are required to take all necessary measures to prevent, reduce and control pollution of the marine environment (Art-194); to prevent pollution from

spreading beyond the areas where they exercise sovereign rights (194-2); to prevent the transfer of pollution damage or hazards from one area to another or the transformation of one type of pollution into another (Art-195); and to prevent, reduce and control pollution from the use of technology on the introduction of new or aline species (Art-196). If there is any breach of the above obligations, states can be held responsible for causing damage to the marine environment unconnected to loss or damage to the interests or environment of other states.⁴⁰

e. Coastal states' right of intervention

As to the right of intervention, the customary international law provided that coastal state could intervene beyond the territorial sea only when there was grave and imminent danger but after certain fatal accidents like the Amoco Cadez and Torry Canyon, it became evident that intervention right should be given to the coastal state much earlier i.e. on the apprehension of the occurrence of such an accident. Thus under Art 211(7) of the Convention requires the flag state to adopt regulations obliging vessels to give prompt warning to coastal states likely to be affected by the incidents involving discharges or the probability of discharges. States are also required under Art-198 to notify each other of the likelihood that they will be affected by pollution damage of which they become aware.

Thus UNCLOS III is unique in its formulation of a structure of principles governing all aspects of marine pollution, prevention and control. In addressing issues of regulation, enforcement and cooperation it reflects a fundamental shift from power to duty as the central controlling principle of the legal regime of the marine environment and a transition from a regime based on obligations of responsibility for damage to one based on obligations of regulation and control.⁴¹

40. *Ibid*, p. 368.

41. *Ibid*, p. 370.

Although UNCLOS III provides for a universal ocean order, but it put emphasis on regional cooperation for effective implementation of the provisions of the Convention. Various regional cooperation agreement have successfully worked for setting standard of liability for pollution. In cases where pollution occurred but no particular states suffered any damage, UNEP and IMO play a crucial role to the implementation of the wider purpose under the Convention of securing more general protection for the marine environment.

B. Regional Efforts

Although it is a recognised fact that because of 'oneness' of the human environment, even the most local environmental problem must be seen globally and from the point of view of its long term consequences, but at the same time it must also be recognised that the world is heterogenous, both in its natural environmental features and its pattern of man-made environmental development. Because of this heterogeneity, very few environmental problems can have uniform 'global solution' and can only be solved effectively by action at the national or regional level. At the same time it must be kept in mind that environmental organisations alone can not protect environmental disaster, only political will can ensure the implementation of any human action. Therefore, the fundamental aim of every environmental policy is to develop such a political will, both at the national and international level and such a political will can be mobilized through national and regional cooperation since each sovereign state is the principle actor of every action within its territory.

United Nations also encourages such endeavour as could be seen in the 'Regionalisation of the Law of the Sea' programme under UNCLOS III. Part XIV of the Convention calls upon states to promote the establishment of regional marine scientific and technological research centre and obligates all states in the region

to cooperate with the centres; part XII provides for protection and preservation of marine environment which establishes the framework for regional cooperation. In short, the Convention emphasised the need to harmonize national policies at the appropriate regional level. More important, provision is made that 'characteristic regional features' should be taken into account in the formulation of standards. Part XII recognises the need to provide scientific and technical assistance to developing states inter alia through regional organisations. As to resource exploitation, regional cooperation to preserve the marine environment is a must since the countries of the region share more or less the same marine resources. Though each state has sovereign right over the resources in its continental shelf, but there are certain biological factors which overlap with each other e.g. the same fish stock or associated stocks may be in two exclusive economic zones (EEZ). Cooperation is called for in the determination of conservation measures and in the flow of information, including cooperation at the subregional and regional levels.

Initiative of the United Nations for successful implementation of the concept of 'regional cooperation' is evident through its 'Regional Seas Programme'. This programme, under the auspices of the UNEP now brings together over 130 states bordering 11 different shared seas around the world, states that have an interest in cooperating for their own and mutual benefit.⁴² Beginning from 1974, UNEP has already established ten regional seas programme (Mediterranean region, Kuwait action plan region, West and Central African region, West Caribbean region, East Asian Seas region, South-East Pacific region, South Pacific region, Red Sea and Gulf of Aden region, Eastern African region) of which South Asian seas region is the latest. South Asian Seas programme is one of the fifteen 'Regional Environment Programme' taken by the 'South Asian Cooperation Environment Plan', in short SACEP established

42. World Commission on Environment and Development, *op. cit.*, p. 270.

in 1982 for solving the environmental problems of South Asia. UNEP is its focal point. Governing council of SACEP is formed by the members from eight countries viz. Iran, Afganistan, Pakistan, India, Sri Lanka, Malaysia, Bangladesh and Bhutan. In the Seminer organised in Bangkok on 25th December 1986, following decisions were taken

- (1) Formulation of coastal environmental plan for Pakistan;
- (2) Development of a system of protected area in the South Asian Seas;
- (3) Assessment of levels of effect of marine pollution in the South Asian Seas region;
- (4) Development of an operational regional contingency plan for responding to marine pollution emergency;
- (5) Survey of land based sources of marine pollution and formulation of guidelines and proposal for environmentally sound waste management technologies and policies;
- (6) Environmental education and promotion of public awareness for South Asian countries in connection with Asian Seas programme.

Functions that are taken specially for Bangladesh under South Asian Seas programme are as follows :

- 1) To identify Bangladesh as the coastal and marine protective area;
- 2) To determine the degree of marine pollution and to undertake cooperative programme with other countries of the region to prevent such pollution;
- 3) To create a regional marine contingency plan for Bangladesh and to take necessary steps;
- 4) To provide a guideline for proper waste disposal management with the help of the experts of international organisations;

5) To take various educational programmes with a view to create environment and pollution consciousness in Bangladesh.

Although there was positive response in the seminar from every quarter, dead lock was created between India and Bangladesh over Farakka barrage issue. Representative from Bangladesh claimed the inclusion of Farakka issue in the final report since it has created adverse effect in the ecological and socio-economic situation of Bangladesh. This was protested by the Indian representative on the plea that the issue was entirely an internal matter of India. Moreover they viewed the forum not the appropriate one to deal with contentious issues of this nature. Anyway the seminar accepted the version of Bangladeshi representative as final and the UNEP has requested Bangladesh government to provide long term political and financial commitment in this regard. But it is to be kept in mind that disagreement on such issues should not create a stale-mated situation in a project so great like control of pollution and protection of environmental disaster on which development of entire region depend and every one should cooperate in the spirit of give and take for the promotion of a better environment. UNEP has already sanctioned \$650,510 for the implementation of the Action plan of South Asian Seas and its two related projects.⁴³ Bangladesh has already created a 25 member national committee for successful implementation of the responsibility of the country in controlling marine pollution in South Asian Seas region.⁴⁴

Although UNEP can provide initial impetus by bringing governments together to develop a flexible legal framework within which further agreements can be negotiated and can also provide initial fund for programme development, but ultimately it is on the governments of the region themselves on whom rests the duty to take over funding and management. The result is a gradually evolving action oriented programme rooted in the needs of the

43. *Official Source*, Department of Environmental Pollution and Control, Govt. of Bangladesh.

44. *Ibid.*

region as perceived by the governments concerned.⁴⁵ But the regional efforts shall never be successful unless and until strong political and administrative actions are taken on national level to control land based development plans and to enforce strong pollution control programme.

Baltic Sea—a case study of regional effort

Baltic region is an excellent example of regional effort.⁴⁶ The Baltic covers an area of roughly 366,000 square km. The Littoral countries of the Baltic Sea are : Denmark, Sweden, Finland, the USSR, Poland, the German Democratic Republic, and the Federal Republic of Germany. Because of the geography of their semi-enclosed Sea, all of them except Denmark and Soviet Union, were members of 'Land-locked and Geographically Disadvantaged' group at the Third UN Conference on Law of the Sea.

The Baltic is very shallow and its seabed is, in virtually the whole area, only continental shelf. The average depth of the sea is only 60 meters. Because of its land-locked nature and great influx of fresh water (about 471 cubic kilometers per year) from some 200 rivers, the Baltic water has a very low salinity which is responsible for long winter freeze up of the ports. The sea receives the drainage of a land area more than four times as large as its own area which accounts much for land-based pollution of the Baltic sea. Apart from natural causes, human action from the littoral states are contributing largely to the pollution of Baltic environment.

The littoral states of the Baltic sea are all highly developed industrialised countries accounting for about 15% of the world's industrial output. A large amount of domestic, industrial and

45. World Commission on Environment and Development Report, *op. cit.*, p. 270.

46. All Informations relating to the Baltic Sea are taken from the article written by Boleslaw A. Boczek, "International Protection of the Baltic Sea Environment Against Pollution" in *The American Journal of International Law*, October 1978, Vol. 72, No. 4, pp. 782-814.

agricultural run-off is discharged into the sea through rivers, outfalls, pipelines and other effluent points. The ICES working groups and other marine scientists roughly estimate that in 1970 the organic BODs (the standard Oxygen demand for decomposing organic material discharge) in tons per year from all the Baltic coastal countries amounted to 1,183,000 tons of which 503,000 from Sweden, 281,00 from Finland, 266,00 from the Soviet Union, 93,000 from Denmark, 20,000 from the GDR and 10,000 each from Poland and FRG. Thus Sweden, Finland and USSR contribute most to pollution by organic waste. Because of dense population and industries like paper, pulp, wood etc, Finland and Sweden are responsible for large amount of sewage and industrial waste into the sea, most of which untreated. Sweden, East Germany and Poland are mainly responsible for contaminating the Baltic environment by harmful and toxic substances like chlorinated hydrocarbon pesticides (DDT, dieldrin, endrin), polychlorinated biphenyls (PCB's) mercury and other heavy metals.

Baltic littoral states are major shipowning nations and in addition represent a sizeable share of international waterborn traffic, accounting for about 20% of the world trade. The result is deliberate discharge of waste into the sea. In 1970 the Baltic ferries alone dumped 50,000 tons of rubbish into the sea. Everyday nearly 250 and 400 cubic meters of rubbish are dumped into the Baltic.

The Baltic sea is also polluted by dangerous toxic wastes. Very high level of arsenic in the sea led to the discovery that sometime in 1930's, 7,000 tons of arsenic had been dumped in concrete container off the Swedish coast.

Although due to the shallow nature of the sea, super tankers cannot enter there but due to increased supply of crude oil to the refineries of Sweden, Denmark, Finland and Poland, the sea is being polluted by oil at an increased rate. Due to relative coolness of water in the sea, the bacterial oxidation is slow and oil remains much longer there. It was estimated in 1971 that even if no more oil

spills occurred, it might take at least 15 years for the last trace of oil to decompose. But more oil spills have since occurred.

The coastal states of Baltic region became aware of the danger of pollution by early 1970s and each of the countries have taken unilateral actions by inacting comprehensive or sectoral legislation against pollution, employing both regulatory and preventive approaches. However international and regional cooperation was necessary because of peculiar ecological situation as well as shared interest among the coastal states of the Baltic Sea.

The 1954 Convention on oil pollution established certain 'prohibited zones' of the seas where discharge of oil by tanker was prohibited. Baltic sea is included within the concept of such zone. Under the 1973 Convention for prevention of pollution from ships not only by oil but also by noxious substances, garbage etc, Baltic sea is included under the concept of 'Special area'. Besides the 1958 Geneva Convention on the High Seas, the 1972 London Convention and partially the 1972 Oslo Convention applies to the Baltic Sea.

In 1955, Denmark and Sweden started bilateral cooperation concerning the Sound, a strait in the Baltic sea, which resulted into the establishment of Joint Sound Water Committee in 1960 and an agreement on the protection of Sound from land based pollution in 1974. In 1968 cooperation to combat pollution in the Gulf of Finland started between Finland and the USSR. In 1972 a Joint Finish-Swedish Gulf of Bothnia Committee was set up to coordinate water quality research programs in that part of the sea.

In 1971, four Nordic countries viz, Denmark, Finland, Norway and Sweden, concluded an agreement pledging cooperation in the implementation of the 1954 Oil Pollution Convention. Thus though attempts had been initiated at the international or sub-regional level to combat pollution of the Baltic sea, but these did not cover every aspect of pollution particularly land based pollution. Need for regionwide arrangement became obvious particularly after the 1972

Stockholm UN conference of an Human Environment and the establishment of UNEP.

Regional management of Baltic pollution dates back to the year 1969 and 1970 when the representatives of the Baltic states met at Visby (Gotland) twice to draft an agreement on the prevention of oil pollution in the Baltic. But the attempt failed due to refusal of FRG to recognise the GDR. With the radical change in West German policy and the recognition of GDR by other littoral states of the Baltic, road to negotiation among the governments opened. On September 13, 1973, in Gdansk, a Convention on Fishing and Conservation of Living Resources in the Baltic Sea and the Belt was signed and entered into effect on July 28, 1974. In 1973, a working group of governmental representatives, technical experts on ship based pollution, and legal experts from the seven countries met and in 1974 prepared a Draft Convention on the protection of Marine Environment of the Baltic Sea Area which entered into effect in 1979.

The Baltic Convention is the first regional arrangement to regulate marine pollution in a comprehensive way dealing with all sources of pollution particularly land based pollution. It is a remarkable cooperation among states professing different political ideology and following different foreign policy orientations.

C. Marine Pollution in Bangladesh

Bangladesh, a South Asian country in the sub-continent with an area of 144000 sq km and population of about 110 millions, is a coastal state. Most of Bangladesh is drained by the Ganges, Brahmaputra and Meghna river system which ultimately flow to the Bay of Bengal. The ocean bordering the country in the South covers nearly 250 miles. Bangladesh coastal area consists of greater Khulna, Patuakhali, Barisal, Noakhali and Chittagong districts alongwith all the islands including Bhola, Swandip, Hatiya etc, covering 36000 sq km with a population of about 20 million.

Bangladesh coastal area has one of the largest mangrove ecosystems in the world and the best among tropical forests. This is an wonderful assemblage of flora and fauna. The offshore marine water considered to be one of the best productive zone for fisheries in the world because of the presence of the Sundarban Mangrove forest.

This unique ecosystem today is threatened because of negligence of people in exploiting the nature to its utter limit both from inside the land and outside. Among the environmental disasters faced by the country like deforestation, desertification, flood, soil erosion etc water pollution is an acute one. Water pollution problem in Bangladesh consists of both the inland river waters as well as the coastal water.

The main reasons behind marine pollution in Bangladesh and its consequences in short are as follows :

Although Bangladesh is not industrialised country but the small number of industries which the country possess are handled in such a way that they are causing grave problem. Most of them are located on the banks of water bodies and none of the industries have any waste treatment plant or approved design from the Environment Department. Thus these industries specially the tanneries, fertilizer factories, paper and pulp industries, chemical plants, distilleries, sugar, jute and textile industries etc are causing severe marine pollution by draining their effluents untreated into the water bodies. During monsoon the flow of the river system is considered enough to dilute most of the waste discharged but in the dry season the dilution factor is tremendously reduced. The dissolved oxygen (DO) in water at higher temperature is low and poor regeneration characteristics of relatively stagnant water in dry season often fail to meet the Biochemical Oxygen Demand (BOD) or rapidly stabilising waste to maintain the DO level above critical at the point of disposal of the industrial waste; The major channels which carry domestic and industrial wastes reverse their flows at high tide and

spread into the coastal city areas causing pathogenic microbiological pollution and serious health hazards during the rainy season and flood periods. The massive death and disease of fish population after the 1988 flood is evident of such disaster.

The use of chemical in agricultural, particularly that of pesticides cause considerable environmental hazards. The flood and rain waters carry part of the agrochemical residues to the river system for final discharge in the coastal regions.

There is acute problem created due to absence of facilities for proper disposal of garbage in the major cities like Dhaka, Chittagong, Khulna etc. Most of the city wastes in our country is not even incinerated and either merely left lying around in waste dumps to slowly dispose by itself or thrown in the river. Chittagong city alone produces 300 tons of garbage per day. The water of Karnaphuly, Buriganga, contains toxic chemicals like ammonia, phenol cyanide nitrogenous compounds and oxygen consuming substances which make drinking of water from these river very harmful, not to speak of destroying marine resources. Absence of proper sanitation facilities and the ignorance of people specially in the village areas results into serious health hazards like diarrheal diseases in epidemic form. The declaration of Barisal, Patuakhali, Khulna as the 'Diarrheal Zone' and the death of thousands of people this year is evidence of how disastrous water pollution can be.

Flood is another reason for marine pollution in Bangladesh. The water of the major rivers reaches to a record high washing away the toxic chemicals from large number of industries. In the 1988 flood, the worst affected by this include Panchagarh, Rangpur, Kushtia and Ghorashal. The waters not only dissolved the industrial chemicals stacked in godowns but also the lagoons of three distillery units (producing rectified spirit viz in Rangpur, Panchagarh and Darshana) and those of the fertilizer factories at Ghorashal, Palash and Fenchuganj. Explaining the magnitude of 1988 chemical pollution problem, an environmentalist said, each of the three

distillery unite used over 70 thousand gallons of toxic chemicals per day and effluents from one such distillery was enough to pollute an entire region.⁴⁷ The bio-chemical oxygen demand of the chemicals released by these was as high as 60,000 miligrams per liter against the allowable limit of 50 per liter, according to a survey carried out earlier by the Department of Environment Pollution.⁴⁸ After flood the Ghorashal and Palash fertilizer caused ammonia and chromium effluents to be mixed with the water of Lakhya river which is already known not to have any fish habitat near the Ghorashal area. Similiar is the area with the Fenchuganj fertilizer factory. The tripple super phosphate factory at Chittagong releases effluents directly into the water at Potanga. This untreated chemicals from the distilleries and fertilizer factories consume dissolved oxygen from water making it unfit for survival of acquatic plants and animals and thus threaten the precious ecological balance.

The water around Chittagong and Mongla Port are highly polluted not only by Industrial effluents but also by the bilge-water and burned oil from ships because the ports do not provide any facilities to dump those wastes, hence causing serious effect on marine resources like shrimp cultivation and fish habitats. Apart from port facilities, the country do not possess adequate petroling system, as a result of which toxic wastes from developed countries could be dumped in the Bay of Bengal without notice. During the last quarter of 1988 the Washington Embassy of Bangladesh had received a telexed warning massage from 'Green Peace', an international environmental pressure group, that a Vessel them naned 'Felicia' had entered the Indian Ocean with an ulterior motive of dumping toxic incinerator ash. The ship after being refused access to ports in Yugoslavia, and Sri Lanka entered Indian Ocean and reached Singapore after emptying its cargo in the territories of certain country which the crew of the ship refused to name. After

47. Mustafa Kamal Majumdar, *Holiday*, September 30, 1988.

48. *Ibid.*

receiving message from 'Green Peace' though the authorities in Bangladesh took up the matter, but since the country, even the Department of Environmental pollution control (DEPC) do not possess the equipments it could not be determined whether such dumping took place.

Another dimension of marine pollution problem is that since Bangladesh has not ratified most of the Conventions and protocols dealing with pollution (viz International Convention for the Prevention of Pollution of the Sea by Oil, 1954, International Convention Relating to Intervention on the High Seas in Use of Oil Pollution Casualties 1969, International Conference on Marine Pollution 1973, Convention on Civil Liability for Oil Pollution Damage 1969, Inter-Governmental Conference on the Convention on the Dumping of Waste 1972, the protocol of 1978 relating to International Convention of the Prevention of Pollution from Ships 1973 etc), she can not possibly take any action even if any accident or spillage of oil occurred. The reason behind this is the fact that Bangladesh government could not provide the minimum facilities in the ports or has not, till recently, adopted any municipal laws on pollution which are pre-requisite to the signing of International Conventions and protocols. Hence the country is often subject to helpless position as could be seen during the oil spill caused by the ship named M.T. Filothei. On 24 September, the ship spilled 2247.7LT of crude oil at the outer anchorage of Kutubdia. Instant protest was made from Chittagong port authority but the ship without making any apology or effort to redone the harm caused by the spillage, left the country quickly. The domestic survey committee as well as survey made under UNDP experts reported the existence of oil floating in large areas (consisting Kalurghat, Dulsi, Shore-line South of the Channel to Chittagong, Moishali island); damage to fish, shrimp culture, Urigrass (wild paddy) and newly planted mangrove; damage to sea beach and coastal mangrove forests etc. Claims for compensation for oil pollution damage could be brought

against the owner of the ship which caused the damage and also against the International Oil Pollution Compensation Fund (IOPC). The basis for such claim are the International Convention on Civil Liability for Oil Pollution Damage 1969 and the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage 1971. But since Bangladesh is signatory to none of the aboves, no action could be taken against the spillage.

Beside taking legal action, Bangladesh do not possess the skilled man-power or technology to clean the mess done either by the oil spill or the dumping of chemical waste. Hence the country is utterly dependent on nature to take its course in cleaning such mess or to suffer consequences of such man-made environmental disasters.

Although the authorities in Bangladesh are fully aware of the need of protecting its marine environment and related ecosystem, very little has so far been done in this respect. Ever since the establishment of the Department of Environment Pollution Control (DEPO) in the wake of the promulgation of the Environment Pollution Control Ordinance 1977, much was said about the improvement of the polluted inland waterways, but the follow-up in the later years had been poor. Considerable response was received after the national seminar held in 1979 under the joint sponsorship of ESCAP, the Swedish Environment Protection Service (SEPS) and DOE. It was identified by the government as 'phase I programme' aimed at protecting the marine and coastal surroundings in the Asia Pacific Region. The seminar broadly identified the constraints as shortage of equipment for use in monitoring and combating marine pollution, lack of trained man-power, absence of legislation and the lack of pragmatic contingency plans. But no progress so far been done as follow-up of the seminar. Bangladesh has become a member of UNEP which proposed to set up a data bank and make arrangements under the programme but because of lack of consensus among

some of the member countries including India, things had not progressed much.

The EIA (Environmental Impact Assessment) which is essential in determining whether a new developmental activity would be environmentally sound, still remains neglected in Bangladesh. EIA involves certain complicated steps which require not only skilled man-power but also to be backed by law. According to the DOE source, due to the absence of a law for EIA, the department can not ensure that EIA is made a pre-requisite for sanctioning projects. There is no representative from the DOE to the Investment Board which is the sanctioning authority for new industries⁴⁹. As a result the industrial projects are causing irreparable damage to the environment. The Asian Development Bank (ADB) has agreed to provide assistance to Bangladesh for developing skilled manpower and strengthening institution for starting of EIA activities in the country⁵⁰.

Although the DOE has identified 13 categories of industries as those which could be held directly responsible for polluting the environment but because of lack of effective legislative backing no action could be taken. Although there is a 1986 Gazette notification issued by the local Division of the Ministry of LGRD and Cooperatives according to which the ministry of Industries has been requested to ensure that new industries as well as the old industries to have antipollution measures or protective system but the Ministry had taken no antipollution measure either at those existing industries identified by DEPC or in new industries sanctioned.

Meanwhile Bangladesh government has declared the year 1990 as the Anti-Pollution year. Its sincerely to protect environment is evident in renaming the Ministry of Forest as 'Ministry of Forest and Environment' and upgrading of the Department of Environment Pollution Control under full fledged ministry. But what is ironic is

49. Moinuddin Naser, "EIA Vital for Environmental Protection, *Dhaka Courier* May 4-10, 1990.

50. *Ibid.*

that nothing tangible has so far been done. The DEPC has so long worked with limited power to enforce the pollution control Act 1977, but upgrading of the department is not still enough to combat pollution problem which still lacks necessary finance, technology and trained manpower. The immediate steps which the government should take to avoid irreparable damage caused by environmental pollution are as follows :

- 1) To adopt effective legislation regarding environment protection for all concerned bodies viz, DOE, Ministry of Industry, Inland Waterways, Port Authorities etc. At the same time close cooperation should be ensured among these departments.
- 2) To provide efficient man-power through training abroad or within the country under the assistance of foreign experts of International Organisations.
- 3) To take measures for establishing necessary technologies essential for controlling pollution e.g. machinaries necessary for waste treatment in industrial plants as well as in the port areas.
- 4) To provide facilities for dumping city garbage as well as disposal of bilge water or oily residues in the port areas.
- 5) To provide proper sanitation facilities in the villages.
- 6) To strengthen the port authorities control as well as petrol system to watch over the activities of ships to stop any illegal activities within the territorial sea as well as outside.
- 7) To sign the various International Conventions and Protocols dealing with pollution and to provide necessary port facilities as well as adoption of municipal legislation which are prerequisite to signing these.
- 8) Finally to create awareness as to hygiene standard among the mass and to initiate extensive publicity and training programmes for that purpose.

Conclusion

Since economic activities geared by scientific and technological development is the source of Ocean pollution, successful effort to control it shall depend on how economic policies are implemented at all level viz national, regional and international. Sustainable development should be the key word in all environmental policies. The World Commission on Environment and Development has defined such development as that 'which meets the needs of the present with compromising the ability of future generation to meet their own need, Need of economic activities can not be avoided since it is the must to feed the growing mouths and we have to adopt such policies which on the one hand shall encourage development and on the other shall be environmentally sound. This should be the aim not only the governmental policies of every state but also the various developmental policies taken at the level of international, regional and subregional.

Various monetary organisations like World Bank, Asian Development Bank, IMF etc could play a very substantial role. Apart from including environmental provisions in the terms of loan and aids these could initiate such innovative measures like the idea of 'Debt for Nature swaps.' This is a concept developed by the conservationists which involves the acquisition of debt by conservation organisation at a discount and its redemption in bonds or local currency to be used for conservation purposes. In July 1987, Bolivia entered into the first 'debt for nature swap' with Conservation International (CI), a U. S. organisation Under the agreement CI purchased \$650,000 of Bolivian commercial debt through Citicorp Investment Bank for 100,000 or 15 percent on the dollar. In exchange for CI'S redemption of the debt, the President of Bolivia agreed to demarket some 1.5 million hectares of tropical forest as protected area and to establish a \$ 250,000 fund in local currency to manage the biosphere reserve.⁵¹ Similar approach could be adopted for encouraging control of marine pollution.

51. Kathryn S. Fuller, 'Debt-for-Nature Swaps : A New Conservation Tool', *Economic Impact*, No, 65 p. 41.

'Since the developed countries are the worst polluter in the world, burden to redone or control the mess depends of them'—is the general approach prevailing in the Third World. Moreover the Third World countries are so engrossed in managing such minor thing as food, shelter etc. that 'protection of environment' usually appear high sounding and abstract to them. Although there is much rationale behind such attitude and although there is no doubt that the major responsibilities lie on the developed world, but at the same time it should be kept in mind that whether poor or rich, we are concerned here about the common future of the Earth. No amount of attempt from the developed world shall be successful unless and until the third World go along with them.

The industrialised nations must therefore pursue the Third World to embrace the goal of sustainable development i.e. economic growth that rely only on renewable resources and does not damage the environment permanently. Much can not be expected from the debt burdened Third World countries unless there is enormous help from the developed countries regarding fund and technology. The question is to what extent the developed countries would be sincere. Even George Bush, widely known as an Environmentalist during his Presidential campaign is backing from his commitment to pay \$ 100 million to be used in the Third World countries to find substitute for chlorofluoro carbon (CFCS) arguing that studing the environment is not complete and the fund should come from organisation like world Bank. Anyway developed countries should play their proper role before ideologizing the Third World countries as to their role. Policies like preaching of environmental ethics on the one hand and dumping wastes in the territories of Third World countries would never make protection of environment a success, because its adverse affect would ultimately reach the doorstep of every one.

Therefore both the poor and the rich should make common effort to protect the Earth in ratio of there capacity. The immediate steps which should be taken are:

- (1) Reforms in institutional and legal framework on the level of international, regional and national which should consider the environment policies together with economic, trade, energy agriculture, industry and other sectors.
- (2) Strengthening the role of non-governmental organisations, conservation groups like 'Green Peace' as well as monetary organisations not only to encourage control of pollution but also to help combating the effects of pollution specially in third world countries.
- (3) Inclusion of environment protection provisions in all types of aids and loans to the Third World countries.
- (4) Increased cooperation in various regional groupings like ASEAN, SAARC, OAU, OAS, EEC etc so that joint actions could be taken in controlling pollution. Exchange of information, scientific knowledge, technology and expert man-power would be very useful in this field.
- (5) Extensive help to the Third World countries from the industrialised countries regarding supply of developed technology, experts, funds to help visualise environmentally sound economic and Commercial activities.
- (6) Finally no amount of cooperation and help shall make the protection of environment as well as control of pollution a success unless and until every individual becomes aware of his own environment as well as its future. Therefore elaborate programmes should be taken at all level to grow a sense of right and responsibility among the states and its citizens.

'Think Globally: Act Locally'—the slogan propagated by the World Health Organisation (WHO) in its celebration of the World Health Day 1990, is most timely and appropriate. As we approach the year 2000 we have to work together to combat the pollution problem as individual, as countries and as part of the entire world for our survival. Although the initial costs and labour may seem huge for a country like Bangladesh and a region like South Asia but we should remember that we are investing in our future and for that we should contribute to our share of responsibility.