TRENDS IN INTERNATIONAL ENVIRONMENTAL LAWMAKING : A CASE STUDY OF THE OZONE REGIME

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DECLARATION

Certified that the dissertation entitled, **TRENDS IN INTERNATIONAL ENVIRONMENTAL LAWMAKING : A CASE STUDY OF THE OZONE REGIME**, submitted by **RUCHI ANAND** in partial fulfiment of the requirements for the award of the degree of **MASTER OF PHILOSOPHY** (M.Phil.) of this University, has not been previously submitted for any other degree of this or any other University, and is her own work.

We recommend that this dissertation may be placed before the examiners for evaluation.

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Preface

The purpose of this dissertation is to discuss certain trends in international evironmental lawmaking that have been incorporated in the legal response to the crisis of ozone depletion. The main role of law in the field of environment is to work on a legal order which allows environmentally detrimental activities to be regulated and monitored. More specifically, it aims at minimising, if not totally avoiding disputes based on environmental issues. This depends heavily on concepts of participation and cooperation. For this purpose, innovative and normative legal concepts are emerging. However, it will be understood subsequently that the crucial phase of a implementation of these new constructs, remain to be addressed, dictating the success or failure of these emerging trends.

My study is planned in five chapters. **The first chapter** is an introduction to the topic and the framework of study. In this chapter, an attempt is made to draw out the emerging trends in international environmental lawmaking.**The second chapter** consists of a detailed examination of the ozone crisis and the negotiations and difficulties to reach and choose policy options.**In the third chapter**, an effort is made to give an indepth study of the Ozone Regime and its various provisions. This provides a basis for the case study. **The fourth chapter** consists of a critical evaluation of the main features of the

instruments of the Regime. An attempt is made to highlight innovations in rule creation and implementation and certain drawbacks of these new methods.**The fifth chapter** deals with conclusions and deductions drawn from this study.

This study is primarily analytical and to a certain extent deductive. The study is based on the use of primary and secondary source material.

I wish to express my special appreciation and gratitude to Dr. Bharat Desai who provided me with his valuble supervision and guidance. I am also grateful to Prof. R.P. Anand, Prof Rahmatullah Khan, Prof. V.S. Mani, Dr. Y.K. Tyagi and Dr. B.S. Chimni for their constant support, encouragement and suggestions.

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CHAPTER I

SOME TRENDS IN INTERNATIONAL ENVIRONMENTAL LAWMAKING

The severity of the environmental crisis has captured attention of the entire international community. The recognition of the need to confront this crisis has also been acknowledged. It is understood to be a global crisis beyond the capacity of any single state to address effectively. As a result, the global agenda has witnessed a reordering of priorities with environmental concerns gaining a significant position.[1] This has introduced an urgent need for new imperatives for international law and cooperation.

There are many environmental problems faced by humankind today. Some of them are climate change, atmospheric and marine pollution, acid rain, hazardous waste, nuclear hazards, dwindling forest cover, extinction of species and ozone depletion. The varied threats to the environment highlight the importance of establishing norms to control activities that endanger all nations and people, regardless of where the activities take place.

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1. See Richard E. Benedick, **Ozone Diplomacy : New Directions Safeguarding the Planet**, (Harvard University Press : Cambridge Massachusetts and London, England 1991). p.ix. Throughout most of the twentieth century, the traditional subjects of diplomacy were political and economic relations. After the second world war other issues arose from the information revolution, developmental needs and technical advances. The twentyfirst century presents new challenges to environmental diplomacy and law making.

In response to these global ecological problems, many international efforts have contributed towards an international environmental legal structure. The need of the hour is to fashion an appropriate and adequate international legal framework which can address the all-embracing critical needs of survival more effectively. This represents new trends in international environmental lawmaking which are innovative, normative and flexible. These improved proposals aim to build on existing institutions and international law.

The international legal order, in general, aims at providing a certain degree of accountability and order to international relations. The capacity of international law to attain the goals it was set to fulfill depends on several factors. One of the fundamental factors is the very nature of problems it is attempting to remedy.

1.1 Nature of Environmental Problems

According to Schneider and Thompson, a prototypical global environmental issue is :

> longlasting...essentially irreversible... on century time scales and...hence intergenerational... It has both perceived winners and losers and is fraught with technical uncertainties.[2]

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2. See Stephen H. Schneider and Starley L. Thompson, "Future Changes in the Atmosphere", in Robert Repetto, ed., **The Global Possible : Resources, Development and the New Century**. (Yale University Press : New Haven and London World Resources Institute, 1985) p.412. This

The nature of environmental problems is reflected, among others, from the following indicators:

(a) One characteristic that distinguishes many environmental agreements from others is that the environment constitutes a global common[3], the management of which requires international cooperation.

This reflects the need for liason, coordination and cooperation between countries. The same is true for the constituent parts of the system; be it economic, political, scientific, legal, diplomatic or ecological. Serving the practical interests of states, the international environmental legal system is proposed to optimise the interests of the states' and the system as a whole.[4] For this, it is necessary to establish rules that are binding on all subjects of international law, regardless of the attitude of any particular state. For, unless all states are

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paper examines three international atmospheric pollution issues - stratospheric ozone changes, acid rain and the carbon dioxide "greenhouse effect". The problems differ in geographic scale and in details but share certain causes, effects and possible policy responses. p.397.

3. "Developments : International Environmental Law", (hereinafter, Developments) **Harvard Law Review**, vol.104, 1991, p.1534.

4. Erwan Fouere, "Emerging Trends in International Environmental Agreements" in John E. Caroll, ed., **International Environment Diplomacy :The Management and Resolution of Transfrontier Environment Problems**, (Cambridge Univ. Press : Massachusetts, 1987), p.31.

bound, an exempted recalcitrant state could act as a spoiler or hold-out for the entire international community. Moreover, such free-rider states profit economically by refusing to share the costs of regulation. Such a situation proves very acute in the environmental context since it prevents any effective agreement to come into being.[5]

There are three types of global commons[6] -allocated commons, unallocated commons and "true commons". The first type consists of resources which are found within the territories of a state or group of states but have an impact on the global environment, (for eg. African elephant, Brazilian rainforests etc). Possessor states have recently aired their willingness, although conditionally, to let these resources fall under the "common heritage of mankind" pool. These states demand that the international community should share costs of protecting these resources. The second type are the unallocated commons such as Antarctica and parts of the oceans. The issue involved in this category is who should control the regulation of these resources. The third type are "true commons" ; resources such as the global climate, atmosphere and ozone layer that are not contained

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5. See Developments, n.3, pp.1537-39.

6. ibid, n.3, pp.1534-36.

in any state. In this category, the hold-out and free-rider problems are severe.[7]

(b) Another distinctive feature of environmental agreements is that they have to respond to scientific evidence of the problem in question. The need for adequate data and evidence places conflicting demands and has the potential of slowing down the journey towards any legal structure. Uncertainty of scientific data leads to a lack of consensus regarding the nature, cause and consequence of the issue in question. This leads to equivocal conclusions about measures required which an delay action. Such delays leading to irreversible environmental harm are unjustifiable. Only when benefits of the additional information are greater than the costs of delay, are such delays acceptable.

Another correlated factor is the difficulty in drawing up an equation of short term costs versus long term benefits. This amounts to the difficulties of carrying out a cost-benefit analysis, and is capable of impeding progress towards legal agreements. Conflicting estimates of environmental damage and cost benefit analyses not only result from scientific uncertainty or lack of data but also from international politics.

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7. See **Chapter III** for discussion on the Ozone issue.

(c) The interest of future generations in environmental policy formulation is another distinctive feature.[8] This issue has two extreme models of response. One is the **preservationist** model which is based on preserving all resources for the future, the other is the **opulent** model which entitles the present generation to exploit resources it wants, without consideration to the future generations.[9] The third intermediate model of intergenerational equity is what commentators propose. Here the questionable aspect is how one should incorporate such a consideration into the formulation of a legal structure and who will dictate the fairness or unfairness to future generations.[10] As a result,

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8. See Anthony D'Amato "Do We Owe a Duty to Future Generations to Preserve the Global Environment?", **American Journal of International Law** (hereinafter, A.J.I.L.), vol.84, 1990, pp.190-98 and Edith Brown Weiss, "Our Rights and Obligations to Future Generations for the Environment", **A.J.I.L., vol.84, 1990, pp.198-207** and Lothar Gundling, "Our Responsibility to Future Generations. **A.J.I.L., vol.84, 1990, pp.207-12.**

9. See The Rio Declaration, U.N. A/C 2/47/9, 4 December 1992, Principle 3. "The right to development must be fulfilled so as to adequately meet developmental and environmental needs of present and future generation". Also see Foo Kim Boon, "Rio Delaration and its Influence on International Environmental Law", **Singapore Journal of Legal Studies**, December 1992, pp.347-64.

10. See Derek Parfit, **"On Doing the Best** for Our Children" in M. Bayles, ed., **Ethics and Population** (1976). The Parfits Paradox arises when we seek to discharge this

there is a visible promising trend to embody perceived common interests on a bilateral, regional and global scale in appropriate institutions, norms and procedures.[11]

The above discussion goes to highlight some of the aspects which are characteristic of international environmental issues. Keeping these in mind will make clear some inherent problems related to environmental lawmaking.

1.2 Need of the Hour.

The weaknesses of the old strategies of international environmental lawmaking suggests the need for newer ways to produce an effective environmental agreement. Palmer has described older methods as "slow, cumbersome, expensive, uncoordinated and uncertain" According to Palmer,

> Unless we device a better way to make international law for the environment, future progess is likely to be piecemeal, fitful unsystematic and even random. If the appropriate steps are not taken now, the manifestly unsatisfactory situation we have will limp along toward crisis.[12]

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intergenerational obligation. He argues that the slight difference resulting from our intervention in the environment will affect the ecosphere in the years subsequent to our intervention. In particular it will affect the condition under which human procreation takes place, and when the sperm cells and eggs will go through different mutations and combinations, different people will be born from those who would have been i

11. See Ved P. Nanda, "Trends in International Environmental Law, **California Western International Law Journal**, vol. 20(2) 1989-90, p.187.

12. Geoffrey Palmer, "New Ways of Making International Environmental Law, **A.J.I.L.**, vol.86, 1992, p.259.

The problem, broadly speaking is how the various obstacles in effective international environmental lawmaking may be overcome. Palmer advocates the need for taking "bold steps" for this purpose. These steps, according to him could be studied by analysing the very nature of environmental issues that we are intending to find solutions for, the institutional arrangement for dealing with environmental issues and currently used methods of making international law.[13] The first of these factors has already been dealt with in the earlier section. The second goes to highlignt that the United Nations lacks a precise and adequate coherent institutional structure for dealing with environmental issues. The United Nations Charter excludes any mention of an exclusively enviornmental organisation but divides the environmental responsibility among specialized agencies.[14] There is thus, the need for an institutional machinery for monitoring, assessing, making and negotiating legal instruments, implementation and

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13. ibid.

14. For example, Food and Agriculture Organisation (FAO), International Maritime Organisation (IMO), World Health Organisation (WHO), World Meteorological Organisation (WMO), United Nations Development Programme (UNDP), United Nations Educational Scientific and Cultural Organisation (UNESCO) with a coordinating role with the United Nations Environment Programme (UNEP), **United Nations Environment Programme** (formed by GA Resolution 2997, 27UNGAOR supp (No.30) at 43, UNDOC A/8730 (1972).

dispute settlement, for evaluating gaps.[15] The third factor brings us to a brief discussion on the methods currently used to make international environmental law. From this will emerge a case for new ways of making international environmental law. Palmer also believes that changes in the world order have created a more conducive environment for achieving change in methods of making international environmental law.[16]

1.3 Hard Law Framework of Enviornment Protection

The international environmental regime constitutes customary law, treaty law, institutions and territorial application of domestic environmental law. Thus, it comprises of both national and international laws.

National and international treaties along with customary rules are examples of hard law. Customary

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15. See Ved P. Nanda, n.5, p.193. According to Ved. P. Nanda (in the context of the Vienna convention and Montreal Protocol) within the international community, there are always significant and uncertain concerns of ensuring treaty implementation. This requires, 1) achieving wide ratification of the instrument for practical reasons of instilling a sense of commitment, 2) A solid institutional structure to oversee and monitor implemantation, apply standardised norms and agree upon remedies.3) Appropriate procedures to assure reasonable acess to the decision making process for those expecting redress under the agreement. 4) An effective incentive and coercive system. 5) A dispute settlement mechanism to encourage observance and answer reliance.

16. See Palmer, n.12, p.259.

international law is the product of state practice and *opinio juris*.[17] If the international community accepts the norms as obligatory under law, and states act in conformity with it, a form of international law is established. This development may take time or may happen quickly or instantly.[18] The practice of nations adapts to comply with new norms, as environmental consciousness expands. This makes it easier to accept that an "international custom, as evidence of a general practice accepted as law", has emerged. This emerges with the backdrop of already practiced international ecostandards, *de lege lata*. New international ecostandards continue to be born, *de lege ferenda*.

Under classical international law, the State is solely responsible to prevent transnational environmental pollution. The doctrines of state responsibility and

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17. See J. G. Starke, **Introduction to International Law**, (Butterworth & Co.: London), 1989, p.38.*Opinio juris sive necessitatis*, 'Recurrence of the usage or practice tends to develop an expectation that, in similar futures situations, the same conduct or the abstention therefrom will be repeated. When this expectation evolves further into a general acknowledgement by states that the conduct or the abstention therefore is a matter both of right and of obligation, the transition from usage to custom may be regarded as consummated'.

18. Bin Cheng, "UN Resolutions on Outer Space: Instant International Customary Law", **Indian Journal of International Law** (hereinafter, I.J.I.L.), vol.5, 1965, pp.23-113.

international liability have codified rules of customary international law.

The maxim *sic utere tuo ut alienum non laedas* provides that states cannot use or permit the use of their territory to the detriment of the rights and legitimate interests of other states and are responsible for the damage they may cause in doing so. The International Court of Justice ruled in the *Corfu Channel*[19] case that every state has a duty not to knowingly allow its territory to be used for acts contrary to the rights of other states. This reflects the basic principle of good neighbourliness. The *Trail Smelter*[20] arbitration had also established this principle of good neighbourliness that can be applied to environmental problems. The *Lake Lanoux*[21] arbitration established the

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19. *Corfu Channel* (UK V. Alb.) 1949 ICJ Reports 7 (Judgement of Apr.9). The ICJ held that Albania was liable to the UK for the loss of two of its warships destroyed by mines laid in the Corfu Channel. Indirect evidence was the basis of the ICJ ruling. It ruled that the nation know or should have known about the mines that were laid in her territorial waters. In the Corfu Channel case, the ICJ did not base its ruling on a treaty but on customary international law.

20. *Trail Smelter* (US V. Canada), 3 R Int'l Arb. Awards 1905 (1938 & 1941). The International Commission ruled, "No State has the right to use its territory in such a manner as to cause injury to the atmosphere by emissions when serious consequences are involved and the injury to the atmosphere is demonstrated by clear and convincing evidence".

21. *Lake Lanoux Arbitration* (France V. Spain), 12 R. Int'l Arb. Awards 281, 1957, 24 **I.L.R.** 101, also reprinted in 53 **A.J.I.L.** 156, 1959.

principle of notification by a state when its actions are likely to impair the environment rights of another state. A few subsequent decisions by international courts and tribunals have ratified the *sic utere tuo* principle in international law.

The principle of *sic utere tuo* has been incorporated in the Stockholm Declaration on Human Environment as Principle 21 which has now acquired the status of a customary law. It reads :

> States have, in accordance with the Charter of the UN and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies and the responsibility to ensure that activities within their jurisdiction or control donot cause damage to the environment of other states or of areas beyond the limits of national jurisdiction.[22]

Moreover, the Declaration also stated that the states shall cooperate to develop further international law regarding liability and compensation for the victims of pollution and other environmental damage caused by activities within the jurisdiction or control of such states to areas beyond then jurisdiction.[23] *Sic utere tuo*, thus,

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22. See Stockholm Declaration on the Human Environment : Report of the UN Conference on the Human Environment, UN Document A/CONF. 48/14 (1972), reprinted in 11 **I.L.M.** 1416 (hereinafter, Stockholm Declaration), Principle 21.

23. ibid, Principle 22.

has attained the status of "general principles of international law recognized by civilized nations" as per Article 38(1)c of the statute of the ICJ. *Sic utere tuo*, continues to remain an abstraction which needs to be filled in with substantive provisions and content.

The concept of self help has also assumed much recognition in environmental protection. This stems from the limitations of state responsibility and state liability to safe guard environmental interest. However, its scope was laid down in the context of armed self defense.[24] Customary international law, has its strengths and advantage of flexibility and standing. It is however limited in scope and insufficient in content, being non-regulatory in character. Customary rules of international law rarely specify required behaviour of state obligations. They are often too ambiguous to be used readily for application to specific disputes or disagreements.[25]

Many developing countries resist being bound by customary international law even if the rule is very determinate. They argue that since they played a limited

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24. Eg. *The Caroline Case (1837)*. See in J.B. Moore, **A Digest of International Law**, (Washington: GPO, 1906), vol.2, p.409.

25. Two cases of application of custom. *Paquete Habana (1900)*, 175 US Supreme Court Reports 677, *The Lotus case (1926)*, PCIJ Ser. A/B, No.22, 1926.

role in the evolution of the custom, they do not wish to be bound by inherited relics for the benefit of the wealthy and powerful states. Often they consider customary principles of environment protection as attempts to curtail their industrial growth. Developing nations[26] maintain that developed countries, who benefitted from the absence of environmental standards before the twentieth century should bear the costs of managing and controlling environmental degradation they have caused. The above discussion clearly shows that divergent norms and differing values can explain the inability to codify more specific obligations of customs.

Conventional treaties as sources of law take time to develop because of the long and difficult process from negotiation to ratification. More so, they require unanimous consent for universal applicability. This makes treaty-making a long drawn out and cumbersome process.

In the environmental context, when there is an urgency of taking action before it is too late, formal treaty-making seems to lag behind the need of the hour. In order to meet the global environmental challenge, a new approach is

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26. See Ampazi Sinjela, "Developing Countries Perspective of Environmental Protection and Economic Development", **I.J.I.L.**, vol.24, 1984, p.489.

required. Environment is an obligation *erga omnes*[27] since all states can be held to have a legal interest in their protection.

1.4 Soft Law Option

An attractive alternative is thus a soft law option. Soft law is a concept of both range and flexibility. It ranges from material that is not law at all, through a long spectrum, to material so close to being hard law as to be indistinguishable from it. Environmental soft law needs to be kept as far as possible toward the high end of the spectrum. It is vital part of the continuous process of building norms.[28] This interest in soft law has been spurred by the nature and limitations of international law itself, specifically, the fact that the provisions of international

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27. The *Barcelona Traction case* ICJ Reports 4, 1970. This judgement mentioned that certain obligations exist. "towards the international community as a whole". In view of the importance of the rights involved, the court declared that "all states can be held to have a legal interest in their protections; they are obligations *erga omnes*. Also see Nagendra Singh, "Right to Environment and Sustainable Development as a Principle of International Law", **Journal of Indian Law Institute**, vol.29(3), July-Sept. 1987, p.289. When a regulation concerns itself with the human being as such, without reference to the national frontiers within which he may reside; that regulation becomes the fountain source of a law applicable to all the human race, whether viewed individually or collectively. By doing so, the law assumes an *erga omnes* character and becomes the "law of mankind" and not merely the "law of nations".

28. Geoffrey Palmer, n.12, p.276.

law are often vague and indistinct, creating commitments that may be subjective, tentative and conditional.

A continuum from hard to soft law with many graduation is the most realistic way to approach soft law. Prosper Weil opines that hard law consists of "norms creating precise legal rights and obligations." According to him, the soft law end of the continuum is characterized by "norms whose substance in so vague,so uncompelling that As obligation and Bs rights all but elude the mind."[29] Baxter also underscores that there are norms of various degrees of cogency, persuasiveness and consensus which are incorporated in agreements between state, but do not create enforceable rights and duties. He describes these soft laws as distinguished from hard laws, consisting of treaty rules which states expect will be carried out and complied with.[30]

Gold's[31] formulation of soft law has two dimensions. First, it may impose an obligation that is so vague and unclear that assessing compliance will be almost impossible. Second, the law may establish an obligation that is crystal

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29. Prosper Weil, "Towards Relative Normativity?", **A.J.I.L.**, vol. 77, 1983, p.414.

30. R.R. Baxter, "International Law in Her Infinite Variety", **International and Comparitive Law Quarterly**, (hereinafter, I.C.L.Q.), vol.29, Oct. 1980, p.549.

31. Joseph Gold, "Strengthening the Soft International Law of Exchange Agreements", **A.J.I.L.**, vol.77, 1983, p.443.

clear, but dilute that obligation by the use of words such as "may" or "should" resulting in law that is just as soft as if no clear obligation has been developed in the first place.

The foremost jurisprudential difficulty is regarding the status of a soft law. Is it really law? A single uniform response to such a question is not possible because soft law instruments are very varied in character. While some are concluded with high levels of specificity, others are rather abstract. Soft law instruments range from treaties with soft obligations to non binding resolutions and codes of conduct, to statements laying down international principles.[32]

Whatever the jurisprudential difficulty involved, soft laws have a substantial advantage in the field of international environmental lawmaking. Between two extreme standpoints of states who donot wish for any regulatory instrument and states which want a strong treaty, soft laws are often viewed as the moderating compromise. A soft law option is thus a better alternative than having no outcome whatsoever. It is branded by some as a political convenience.[33] Besides providing greater range and

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32. C.M. Chinkin, "The Challenge of Soft Law : Development and Change in International Law", **I.C.L.Q**, vol.38. October 1989, p.851.

33. ibid, p.861.

flexibility, soft laws also add manouvreability and allow opinions to coalesce. This begets greater participation and support. Environmental soft law, thus, is an important part of the process of building norms. This is attributable to the right setting which soft law instruments create, for the emergence of a hard law instrument.[34]

The evolving international legal order requires ways and means for change and development to fulfil demands of new subject areas. Challenging the various traditionalities of international law, soft law option represents change and evolution. This development may be viewed as a consequence of some pressing needs for changes in international law, which have not been met adequately.[35] That, it too has many weaknesses and shortcomings cannot undermine its contribution as an innovative step in lawmaking, as an emerging trend in international environmental lawmaking.

1.5 Framework convention-protocol approach

The framework convention-protocol approach is a soft law strategy keeping in mind that many states may not be ready for concrete and specific legal obligations. As the name suggests, contracting parties lay down the broad policy

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34. ibid, p.856.

35. ibid, p.866.

framework leaving the nettlesome details to be worked out in subsequent protocols.

This approach has been used for involving a legal regime for the ozone depletion problem, details of which will be discussed in the subsequent chapters.[36] This approach, aids in making the negotiating process less unweildy and unmanageable. Besides, it does encourage greater participation of states by providing breathing space between the framework convention and subsequent protocols.

The apparent success of the ozone negotiations has led to the framework convention-protocol approach becoming the favoured method of creating multilateral environmental agreements. It can be viewed as a response to the very nature of environmental issues.

1.6 Precautionary Principle

The use of the precautionary principle[37] is another

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36. See **Chapter IV** of this dissertation.

37. See Ved P. Nanda, n.11, p.192. The principle is used in the Climate Change Convention, 1992. In the context of the uncertain phenomenon of global warming pertaining to the time frame. Ved P. Nanda discusses various strategies for confronting this challenge. One type is *adaptive*. This approach seeks to modify social trends to cope with climate change. This could be implemented unilaterally. e.g. This strategy is likely to be chosen after a disaster occurs and involves large expenses A second type of strategy is *preventative* which seeks to prevent damage rather than adjusting after disaster strikes. Some of these may be applied unilaterally too

development to suit the requirements of certain environmental issues. When scientific data, as proof of a crisis, is inadequate to present an environmental impact assessment (EIA) and a cost-benefit analysis; a legal norm a precautionary principle can delay or save catastrophes. It means action based on anticipation.[38] However, due to expenses involved and apparent lack of instant results, such a principle may face much political and public resistance.

1.7 Public Participation

Coupled with the growing process of centralization of environmental lawmaking, regional, bilateral and non state entities (eg. nongovernmental organisations) are increasingly playing a significant role in setting

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but have to be pursued by a large number of states to have the desired outcome. This too has some inherent problems. Also see Cameron and Werksman, The Precautionary Principle : A Policy for Action In the Face of Uncertainty, **C.I.E.L. Background Papers on International Envirionmental Law**, (School of Law, King's College, London), No.1, 1991.

38. See Rio Declaration, n.9, Principle 15. "In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing *cost-effective* measures to prevent enviornmental degradation". (emphasis added) This Principle has also been embodied in the Stockhlom Declaration without the word *cost-effective*, in many ministerial declarations and conference statements.

standards and evolving regimes.[39] Effective international environmental agreements must also establish institutional arrangements for continuous cooperation.

1.8 Conclusion

All efforts, therefore need to be are directed at continuously exploring new ways for effective environmental lawmaking to suit the demands of the issue in question.

The development of an effective international legal regime requires substantive norms corresponding to state interests, yet based on concerted international action. The recognitions of a common interest of humankind; the global environment and the growing awareness for the need to address these challenges effeictively, have created the ideal setting for the expedious development of an appropriate international legal environmental framework. My study is based on the legal response to the problem of ozone depletion, which is discussed in the following chapters.

39. ibid, Principle 10 : Public Participation. "Environmental issues are best handled with the participation of all concerned citizens at the relevant levels".

CHAPTER II

THE OZONE CRISIS

The Ozone Regime[1] presents an exemplary model to highlight the emerging trends in international environmental lawmaking. However, in order to understand the legal response to the crisis it is essential to conduct a detailed and systematic study of the crisis itself and the series of negotiations that led to the creation of a legal structure.

2.1 The Ozone Layer

The existence of ozone was unknown before 1839.[2] A highly unstable molecule of oxygen, ozone contain three atoms. It is found in the atmosphere in differing concentrations, mainly in its lower two layers, the troposphere and the stratosphere.[3] The troposphere extends 10-12 kilometers upwards from the surface of the earth, while the stratosphere lies between the troposphere and 50

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1. The Ozone Regime Comprises : The Vienna Convention for the Protection of the Ozone Layer, 1985; The Montreal Protocol on Substances That Deplete the Ozone Layer, 1987; The Helsinki Declaration, 1989; The London Amendments, 1990, The Copenhagen Amendment, 1992 and The Bangkok Meet, 1993.

2. Ozone was discovered in 1840 by a German chemist, Christian Friedrich Schonbein. See Frank C. Andrews, **The World Encyclopedia**, vol.14, (World Book Inc.: Chicago, London, Sydney, 1983).

3. UNEP, **The Ozone Layer**, UNEP/GEMS, Environment Libr., No.2, 1987, pp.9-10.

kilometers above sea level. What is referred to as the ozone layer is the region of high concentration of ozone molecules, in the middle stratosphere.[4] When an ultraviolet (UV) light photon strikes an oxygen molecule, the oxygen molecule splits into two oxygen atoms. These atoms instantly combine with the intact oxygen molecule to form ozone. Ozone then, absorbs the harmful ultraviolet radiation and disintegrates into its original parts (O and O_2). Ozone is then recreated when the freed atom of oxygen joins up with another oxygen molecule. These continuous reactions ensure that ozone levels are maintained in a state of dynamic equilibrium. It is the introduction of anthropogenically manufactured chemicals which accelerate the process of destruction of ozone.[5]

The ozone layer performs vital functions to life on earth.[6] Stratospheric ozone, in the process of its creation and destruction, absorbs harmful solar radiation wavelengths and prevents it from reaching the earth's surface. Besides, it absorbs and emits thermally significant terrestrial

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4. ibid., p.9.

5. Richard S. Stolarski, "The Antarctic Ozone Hole", **Scientific American**, vol.30, 1988, p.258.

6. United States Environment Protection Agency, (USEPA) **Analysis of Strategies for Protecting the Ozone Layer** (hereinafter, Analysis of Strategies), Working Group Meeting, 21-25 Jan. 1985, Geneva, Switzerland.

infrared radiation, maintaining the stability of global climate.

2.2 Ozone Depletion

In 1973, two scientists of the university of Michigan, Richard Stolarski and Ralph Cicerone were studying the effects of possible chemical emmission from National Aeronautical and Space Administration (NASA) rockets. In 1974, their published research showed that a single chlorine released in the stratosphere is capable of triggering off a complicated chemical reaction which would continuously destroy ozone for many decades.[7] However, this theory at first did not seem very alarming because, at this stage the hypotheses was rather controversial.

In 1974 Mario Molina and Sherwood Rowland at the University of California, Irvine, studied some unusual characteristics of chloroflurocarbons (CFCs) which are widely used anthropogenic chemicals. They discovered the exceptionally stable[8] chemical structure of CFCs which

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7. Richard S. Stolarski and Ralph J. Cicerone, "Stratospheric Chlorine: A Possible Sink for Ozone, "**Canadian Journal of Chemistry**, vol.52, 1974, pp.1610-15, Also see. Mario J. Molina and F. Sherwood Rowland, "Stratospheric Sink for Clorofluoro Methancs: Chlorine-Atom-Catalysed Destruction of Ozone, 249, **Nature**, 1974, p.810.

8. See UNEP : **The Ozone Layer**, n.3, p.11. CFCs, depending on their individual structure, can remain intact for many decades and even centuries. Common CFCs and halons have atmospheric lifetimes of 75-110 years.

persist and move slowly up to the stratosphere. Eventually, solar radiation breaks down CFCs, releasing large quantities of chlorine into the stratosphere.[9]

The above two individual hypotheses, it was found, had combined implications. This led to a link between CFCs and ozone depletion. Revelations of this link came as an environmental as well as economic bombshell. Invented more or less by accident in 1928, they were first developed as the working fluid for refrigerators. Later, since 1950 they started being used as propellants for aerosol cans. Next, they were used as solvents. Newer uses of CFCs were explored till CFCs became important contributors in a number of critical areas.[10] However, the chlorine released from CFCs, has been found to destroy the natural balance of ozone in the stratosphere.[11] In addition to CFCs, halons which

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9. See Jack Fishman and Robert Kalish, **Global Alert: The Ozone Pollution Crisis**, 1990, pp.44-45. CFCs are virtually the sole source of chlorine in the stratosphere. Natural chlorine exists in the stratosphere at a level of approx. 0.6 parts per billion.

10. **The Montreal Protocol: A briefing book**, Alliance for Responsible CFC Policy, December 1987, Virginia, USA, p.V-3.

11. See The Ozone Layer, n.3, pp.9-10. According to chemists, the third oxygen atom reacts with chlorine(cl) to form a chlorine monoxide encounters a free oxygen atom, which is highly reactive, forms a new oxygen molecule, freeing chlorine. This loose chlorine radical begins Ozone destruction again.

contain bromine, are a major factor in the destruction of ozone molecules. Halons are used only as agents for fire extinguishers and are ten times more ozone destructive than CFCs, carbon tetrachloride and methyl chloroform too pose a serious threat to ozone. Although there is still inadequate evidence that ozone depletion is caused by CFCs (and halons) there are no longer questions about an implicit relationship.

2.3 Implications of Ozone Depletion

There are serious implications of ozone depletion on human health, on plants and animals, on aquatic life, on air pollution, on building materials and on the climate:

(A) UV-B radiation has many effects on the body, both positive and negative. The adverse effects, however, overshadow the positive ones.

(a) UV-B radiations may cause sunburn, cataract, snow-blindness, ageing of the skin and skin cancer.[12] Some predictions include a 2-5 percent increase in squamous skin cancer. There is also a predicted increase of 1-3 percent in basal skin cancer and a 1-2 percent increase

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12. The Swedish Society for the Conservation of Nature and Annika Nilsson (Stockholm, 1990), **Saving the Ozone Layer: A Global Task** (hereinafter, Saving the Ozone Layer), January 1990, p.8.

in melanoma skin cancer, for each one percent depletion of the ozone layer.[13]

(b) UV-B influences the immune system. It can suppress the immune defense against not only tumors initiated in the skin; but also against infections of the whole body. This occurs, irrespective of skin colour and there are a large number of diseases that might increase in both evidence and severity with an increase in the UV radiation. Some of these include herpes, measles, chicken pox, viral diseases, malaria, leish maniasis, bacterial infections such as tuberculosis and leprosy; and fungal infections too.[14]

(c) Ultraviolet radiations may contribute to a variety of eye disorders, particularly cataract which can cause blindness. A study made by the United States Environment Protection Agency (USEPA) claims to have recorded that every 1 percent decrease in stratospheric ozone, cataract will increase between 0.3 and 0.6 percent.[15]

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13. EPA: Office of Air and Radiation, **An Assessment of the Risks of Stratospheric Modification** (hereinafter, Stratospheric Modification), 1986, p.6.

14. Saving the Ozone Layer, n.12, p.9.

15. ibid., p.10.

(d) The genetic material, DNA, in each cell is sensitive to UV light. Any damage to this genetic component can kill the cell or turn it to a cancerous one.

In each of these cases the future generations would be more severely affected as they would have to be exposed to these radiations much longer.[16]

(B) UV-B radiation affects the ability of plants to capture light energy during photosynthesis. Legume, squash and cabbage families are particularly sensitive to its negative effects. Forests appear to be vulnerable too. Thus an alteration in crop yields and forests growth has been adversely affected.[17]

(C) There has been a visible alteration in aquatic ecosystems and aquatic food chain. It is estimated that a 25 percent reduction in ozone would lead to a 10 percent loss in primary production in the upper layer and a 35 percent reduction in the lower layer.[18]

(D) Photochemical smog is a result of increased UV light at the earth's surface. Traffic and industry emissions interact with the UV light leading to a highly

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16. ibid.

17. ibid., p.11.

18. Stratospheric Modification, n.13, pp.7-8.

reactive chemistry forming ozone. This low-level ozone is a toxic pollutant gas and is harmful to plants, animals and humans.[19] (E) Ultraviolet light degrades polymers used in industry (e.g. buildings, paints, packaging etc.) necessitating expensive economic counter-measures.[20] High temperatures and abundant sunshine hastens and increases the process. This jeopardises polymers in developing countries.[21]

(F) There are two different ways in which CFC emissions contribute to global warming.

(i) Firstly, CFCs are greenhouse gases like carbon dioxide and thus can trap heat. This results in an increased average temperature and obvious climate changes.[22] Every CFC (11 and 12) can warm the earth 10,000 times as the carbon dioxide molecule can.[23] They are responsible for an estimated 15-20 percent increase in global warming.[24] Even when the temperature changes are small, the effects of 'global warming' are rather

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19. Saving the Ozone Layer, n.12, p.12.
20. Stratospheric Modification, n.13, p.8.
21. Saving the Ozone Layer, n.12, p.12-13.
22. ibid., p.11.
23. UNEP: Action on Ozone, 1991, p.5.
24. Saving the Ozone Layer, n.12, p.11.

severe. As a result of the warming, sea water expands. This increases the chances of floods in low lying regions. The warming also leads to the melting of polar caps which make sea levels rise to threatening levels.[25] Such increases could erode coastlines, damage wetlands and increase damage from storms. Studies are said to predict that sea levels could rise by 10-20 centimeters by 2025 and by 55-190 centimeters by 2075.[26]

(ii) Secondly, the destruction of ozone allows more sunlight in the lower atmosphere and thus heats it. This process, simultaneously, implies cooling of the stratosphere, because of the redistribution of heat in the atmosphere from a higher layer to a lower one. This further creates the ideal conditions for cloud formation in the stratosphere, facilitating more ozone depletion.[27]

2.4 Need for a Response

While addressing the first session of the United Nations Environment Programmes (UNEP) Governing Council in

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25. ibid.

26. ibid.

27. National Academy of Sciences: **Causes and Effects of Changes in Stratospheric Ozone, An update 1983**, NAS, Washington DC, 1984.

June 1973, the Executive Director's address cited damage to the ozone layer as a possible "outer limit" which humanity would be wise to respect. Pollution that disregarded the limit, he added, "may endanger the continuance of human life on this planet."[28]

Obviously, this alarming data requires some response. Thus, the need for identifying goals and then, acting on them became urgent. One fundamental goal in the case of the ozone crisis is to maintain the ozone layer in as undamaged a condition as possible. A second objective should be to establish international guidelines by international consensus. These should lay stringent controls that accommodate the limited use of CFCs for vital economic uses, while totally eliminating wasteful uses of CFCs.[29] After all, common international interest demands urgent and whole hearted action without delay to protect and preserve the ozone layer. For developing a suitable response, four important factors must be kept in mind- effectiveness, economics, equity and enforceability.[30]

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28. Action on Ozone, n.23, p.6.

29. John Warren Kindt and Sammnel Pyeatt Menefee, "The Vexing Problem of Ozone Depletion in International Environmental Law and Policy, **Texas International Law Journal**, vol.24, 1989, p.270.

30. USEPA: Analysis of Strategics, n.6, p.2.

2.5 Divergent Responses

The next several years after the 1974 theories were full of disputing personal and professional stands within the scientific community.[31] The international chemical industry vigorously denied any connection between CFCs and the diminishing ozone layer.[32] An acceptance of the CFC-ozone link would mean the beginning of the phasing out of CFCs and exploring substitute products.

To a great extent, official disagreements between the United States and the twelve nation European Community[33] (now European Union) on ozone policy reflected important disparities in public perceptions of the danger. These differences influenced both the politics and economics of the issue.[34] This is because the EC and the US emerged as the principal protagonists in the diplomatic process that culminated in international agreement.[35] The US and the EC

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31. Lydia Dotto and Harold Schieff, **The Ozone War** (Garden City; New York, Double day, 1978), Chapters 1 and 3.

32. Richard Elliot Benedick, **Ozone Diplomacy: New Directions in Safeguarding the Planet**, (Harvard Univ. Press: Cambridge Massachusetts and London, England, 1991). p.12.

33. The European Community consists of Belgium, Denmark, France, the Federal Republic of Germany, Greece, Ireland, Luxemburg, the Netherlands, Portugal, Spain and the United Kingdom.

34. Richard E. Benedick, n.32, p.23.

35. ibid.

had disagreement over scientific evidence[36] and the necessity for international regulation.[37] Besides these transatlantic conflicts, there were conflicts of stand even within the EC. Therefore, any effective solution to this much debated crisis, required a global context. The United Nations Environment Programme (UNEP), in the midst of national debates was laying down the groundwork for an international approach acting as a catalyst for this mission for humankind. with an annual budget of less than 40 million dollars, the UNEP proved indispensable to the process of arriving at an international consensus to protect the ozone layer.[38]

2.6 Towards a Legal Regime

At the third meeting of the Governing Council of UNEP,

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36. ibid., p.29, Some Observers believes that differences between the EC and the United States in public sensitivity to warnings concerning the ozone layer may have been related to the early space explorations and related American pre-eminence in Stratospheric Sciences (e.g. National Aeronautical and space Administration (NASA) and the National Oceanic and Atmospheric Administration (NOAA). There was no equivalent of NASA/NOAA in Europe.

37. ibid., pp.31-33. The US producers, principally Dupont, Allied and Pennwalt, appeared more sensitive than their EC counterparts, to the evolving science and related environmental risks from the growing CFC emissions. France's Atochem, Britain's Imperial Chemical Industries, Italy's Montefluos and West Germany's Hoechst, were aiming to preserve market dominance for as long as they could avoid taking to substitutes.

38. ibid., p.40.

a programme was proposed by the Executive Director on the risks that the ozone layer was facing.[39] In September 1975, the UNEP funded the World Meteorological Organisation (WMO) technical conference to study the implications of US research. This resulted in the first official statement of international scientific concerns about CFC,s[40] The UNEP Governing Council also decided on an international conference "to review all aspects of the ozone layer." Accordingly, experts from 32 countries met in March 1977 in Washington D.C. and adopted, the "World Plan of Action on the Ozone Layer." This agreement was a detailed 21 point research plan covering the monitoring of ozone and solar radiation, the assessment of the effect of ozone depletion on human health, ecosystems and climate. It also included a cost-benefit study of control measures. Various UN agencies and international non-governmental organisation (INGOs) took responsibility for specific parts of the programme, with the UNEP coordinating these roles.[41] A Coordinating Committee on the Ozone Layer (CCOL), was established by the UNEP which

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39. Action of Ozone, See 23, p.6

40. World Meteorological Organisation, **Statement on Modification of the Ozone Layer Due to Human Activities and some Possible Geophysical Consequences**, WMO/R/STW/2, annex, Geneva 1975.

41. Action on Ozone, n.23, pp.6-7.

prepared periodic reports that served as valuable references for policy makers.[42]

The US hosted an intergovernmental meeting (April 1977), where for the first time, questions regarding international controls over CFCs were formally raised.[43] In May 1977, the US announced that it was phasing out the use of CFCs in aerosol cans. Canada, Norway and Sweden placed similar bans.[44] This move, however, was thought to be premature by several countries who opposed it. Within the EC, while West Germany was prepared to reconsider its earlier opposition to the ban, UK and France blocked any consensus on the issue. The UNEP Governing Council in April 1980 passed a non-binding resolution, which suggested reduction of CFCs without setting fixed targets.[45] In May 1981, it took a further step and set up a working group to prepare a global framework convention for the protection of the ozone layer. This followed the UNEPs successful formula originally developed to reach agreements between coastal states to conserve the common seas. The format was a general treaty resolved to tackle a problem in principle; followed

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42. Richard E. Benedick, n.32, p.40.

43. ibid., p.41.

44. Thomas B. Stoel and Others, **Fluorocarbon Regulation**, (DC Health: Lexington, Massachusetts, 1980), p.275.

45. Richard E. Benedick, n.32, p.41.

by the more arduous task of agreeing on protocols which drew up specific controls.[46]

In strategic terms, such a multi-options approach or framework convention-protocol approach, was to provide immediate insurance against the potential threats of depletion, while providing the scientific community the requisite time to reduce existing uncertainties.[47]

The UNEP took a next logical step in January 1982 and convened an Ad Hoc Working Group of Legal and Technical Experts for the Preparation of a Global Framework Convention for the Protection of the Ozone Layer. Representatives of 24 countries attended this meet in Stockholm. The UNEP working Group negotiated (1982-85) a convention on research, monitoring and data exchange but failed to agree on a 'protocol on CFC controls.'[48] This was due to the sharp divide between two general groups: the Toronto Group comprising Canada, Finland, Norway, Sweden and Switzerland (later the US joined too) who advocated a worldwide ban on non essential uses of CFCs.[49] The European Community, on the

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46. Action on Ozone, n.23, p.7.

47. USEPA: Analysis of Strategies, n.6, p.2-3.

48. Peter Sand, "Protecting the Ozone Layer: The Vienna Convention is adopted" **Environment**, June 1985, p.19.

49. Richard E. Benedick, n.32, p.42.

other hand, made clear that it was not intending to negotiate on any sort of reduction of CFC production or use. Followed by Soviet Union and Japan, the EC countries rejected the notion of any international regulatory regime. Later in 1984, the EC proposed an alternative draft protocol text that prohibited addition to CFC production capacity. However, the deadlock continued regarding the protocol. It is presumed that if the Toronto Group had insisted in Vienna any further on the adoption of a protocol with control schedules, many CFC producing countries would have opted out of the exercise.[50]

2.7 The Vienna Convention

In March 1985, representatives of 43 nations, of which 16 were developing countries, convened in Vienna to complete work on the ozone convention. The efforts paid dividends with substantial agreement on the framework convention as well as all elements of the subsequent protocol excepting control provisions. Finally, the Vienna Convention for the Protection of the Ozone Layer was signed by 20 nations and the EC convention on 22 March 1985.[51] Underlining the significance of the framework convention, Mostage Tolba, the then UNEP Executive Director, concluded on the legal response to the ozone issue :

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50. ibid., p.44.

51. ibid., p.45.

> This is the first global convention to address an issue that for the time being seems far in the future and is of unknown proportions. This convention, as I see it, is the essence of the anticipatory response so many environmental issues call for: to deal with the threat of the problem before we have to deal with the problem itself.[52]

Despite the stalemate in the area of regulatory measures, the Convention was in a sense a success providing an umbrella treaty on the ozone problem.[53]

2.8 Montreal Protocol

There were two important developments that came about as work progressed towards a second meeting for the adoption of a protocol. The first of these was the announcement of an alarming report[54] by a British research group in May 1985. This report identified huge losses in the ozone layer over Antarctica, leading to an ozone hole. It observed:

> The hole, a previously unknown and unsuspected phenomenon, dated back to 1977. Although it first became prominent enough to spot in 1981, when it was noticed by members of the British Antarctica survey, who then watched it grow year by year[55]

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52. Excerpt from the Statement of Mostafa Tolba, Executive Director of UNEP, delivered at the Convention for the Protection of the Ozone Layer, Vienna, Austria, Quoted in Sand, n.48, p.20.

53. ibid., p.41.

54. NASA, : **Present State of Knowledge of the Upper Atmosphere: An Assessment Report, 1986**, p.15.

55. Taubes and Chen, "Made in the shade?", **Discover**, August 1987, at pp.62-63. Quoted in Kindt and Menefee, n.29, p.280.

In fact the, American satellite measurements (through NASAs Nimbus 7 satellite) confirmed the results of the British team. Earlier too, it had recorded the ozone hole which was rejected due to some interpretational errors.[56]

It was also found that a "hole" opens every southern spring in the ozone layer over Antarctica. This hole, said to be as big as the United States and as deep as Mount Everest was growing since the late 70s. When it was at its biggest in October 1987, the total ozone count cover was less than half of its 1970 Level.[57] It was found that between 15 and 20 Km over Antarctica, where depletion was the most, 95 percent of the ozone had disappeared[58].

As a result of the increasing evidence that the ozone layer was getting depleted all over the world, the ozone problem was high on the world's diplomatic agenda[59]. The finding of airborne Antarctica ozone experiment seemed to single out meteorology and unusual chemistry as responsible factors for the seasonal ozone decreases over Antarctica.[60]

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56. John J. Nance, **What Goes Up: The Global Assault On Our Atmosphere**, (William Morrow and Co. Inc.: New York, 1991), pp.78-80.

57. UNEP: Action on Ozone, n.23, p.4.

58. ibid, p.4. Also see R.E. Benedick, n.32, p.110.

59. Kindt and Menefee, n.29, p.281.

60. The Montreal Protocol : A Briefing Book, n.10, p.iv-3.

There was a major controversy regarding the possible cause. Two camps emerged, one who looked for chemical culprits and the other who reasoned depletion as port of some natural variations in the atmosphere. Finally, in August 1986, scientists of the National Aeronantical and Space Administration (NASA), and the National Oceanic and Atmospheric administration (NOAA) cosponsored National Ozone Expeditions (NOZE) noted that a chemical mechanismn is basically responsible for the Antarctica ozone hole.[61]

It was subsequently established beyond doubt that CFCs were responsible for the phenomenon, aided by meteorological factors of the area. The extremely cold and isolated mass of air over the South Pole created the ideal conditions for the chemicals to play havoc.[62] The second trend[63] facilitated moves to adopt reductions and phasing out of CFCs by developing environment friendly substitutes. At this point of time, having realised the gravity of the situation, almost all of the interested parties agreed on the need for some phased reductions[64].

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61. UNEP: Action on Ozone, n.23, p.4

62. ibid.

63. David Caron, "Protection of the Stratospheric Ozone Layer and the Structure of International Environmental Lawmaking, **Hastings International and Comparative Law Review**, vol.14, 1991, p.759-60.

64. ibid., p.760.

As a result of these two developments, a substantive protocol to the Vienna Convention was adopted in Montreal in September 1987. Although the final report of the Antarctica hole study was not yet released, a remarkable fifty percent reduction in consumption and production of certain CFCs over some ten years was agreed upon.[65] The main issues that had been the subject of debate from December 1986 to September 1987 were concerning the chemicals to be included, controls of their production and consumption, the year from when reductions would be calculated, size and timing of these cuts, entry of force and revision of the treaty, the question of weighted voting, trade restrictions for non parties, special status of developing countries and the European Community.[66]

The issues involved were very complex involving scientific, technological, economic and political variables. The task which at first seemed formidable worked out to accommodate these variables and inbuilt conflicting standpoints.[67] As a result, the final agreement reflected

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65. Kindt and Menefee, n.29, p.270.

66. R.E. Benedick, n.32, p.77.

67. ibid, p.(xii).

68. UNEP: Action on Ozone, n.23, p.11.

the fineness of the negotiations. The Protocol is extremely flexible, yet can be tightened as scientific evidence gets strengthened, without having to completely reformat and renegotiate it.[68]

The Montreal Protocol came into force on 1 January 1989. Twenty nine nations and the EEC, representing almost 82 percent of world consumption of CFCs ratified it.[69] Of these,44 nations were those who had not even ratified the[70] Montreal Protocol. The Vienna Convention and the Montreal Protocol created dynamics of its own. In June 1988, Sweden became the first country to legislate a CFC phase out schedule. Others quickly followed it which included Denmark, Finland, Belgium, the Netherlands, New Zealand, Norway and Switzerland. They made public their intention to reduce CFCs faster than the Protocol required. The United Kingdom, which in the pre-Montreal negotiations was one of the rather skeptical developed countries also announced its willingness for CFC reduction. It decided to halve consumption by the end of 1989, subsequently aiming at an eighty five percent cut.[71] Following this, the Prime Minister of the United Kingdom, together with the UNEP

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69. ibid.

70. ibid., p.16.

71. ibid., p.15.

called a special conference in March 1989 in London to accelerate further reductions and mobilise the international community in this direction. It worked wonders.[72]

The twelve nation European Community also decided on a complete phase out of CFCS by the end of the century. They were followed by United States which undertook the same commitment. At this conference, twenty more countries decided to sign the Protocol. The Helsinki Declaration, had eighty one countries unanimously agreeing to phase out production and consumption of CFCs, halons and other ozone-depleting-substances (ODSs) as soon as possible, but not latet than the year 2000. They further agreed on developing environmental friendly substitutes, set up a working group in order to develop an international funding mechanism, keeping in mind developing country interests.[73]

The Helsinki meeting was a phenomenal success when it came to "breadth and level of participation sense of urgency and extent of consensus."[74] The Helsinki Declaration was an expression of will and was not legally binding. This is

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72. UNEP: Action on Ozone, n.23, p.15.

73. ibid.

74. R.E. Benedick, n.32, p.124.

because, the Protocol could not be revised until the second meeting of parties, scheduled at London 1990[75]

2.9 The London Amendments

The stage was set for the second meeting and more and more nations were calling for accelerated cuts in ozone depleting substances. Some countries even adopted unilateral measures for be same. At the London meet, the primary issue was whether the phase out should be achieved by 1997 or 2000.[76] Consensus was reached to amend the Protocol to phase out fully halogenated CFCs and carbontetracloride by 2000, and that of methyl chloroform by 2005. So, further phasing out marked the London meet.[77] Another distinctive feature was the construction of new international structures to recognise the right of developing countries to assistance and transfer of technology in order to encourage participation. It also established a Multilateral Fund which was a significant move. The conclusion of the London meeting had the representatives of India and China indicating their willingness to sign the Protocol in 1992.[78] The issues that stem from this junction are the

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77. ibid, p.762.

78. ibid, p.763.

facilitation, monitoring and enforcement of its implementation.[79] Susequently, these issues were addressed in the Copenhagen Amendment, 1992 and the Bangkok Meet, 1993.[80]

2.10 Some Observations

Within a very short span of time, the systematic evolution of the legal regime response to the ozone crisis is an important study because it brings to focus some interesting developments in international environmental lawmaking. The framework convention-protocol approach was skillfully incorporated as the main tool to galvanise the imperatives of a world wide environmental. The Vienna framework convention was filled in with subsequent details and more stringent provisions in the Montreal Protocol. The London Revisions further added provisions that made the regime more complete, stringent and expedited. This approach also helped coalesce opinions and actions of divergent groups to come to terms with the impending ozone threat. This step-by-step approach to the problem at hand, aided the possibility of greater participation and the will to cooperate on the part of states.

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79. ibid, p.764.

80. See **Chapter III** of this dissertation.

In addition, the precautionary principle was adopted to salvage the depleting ozone layer while the scientific community was working on confirming the intensity and urgency of the crisis. As the scientific proof of the depletion became stronger, so did the provisions of control. This has ensured a fine in-built lawmaking process, with flexibility and smoothness within the ozone regime.

The negotiations highlight the need for multilateral efforts by the international community to tackle a global environmental problem without a cumbersome and lengthy treaty-making process. Multilateralism also allows the sharing of costs to preserve a common resourse. A unilateral action does not contribute in the same way as does concerted action in an issue which is global in dimension. In fact, the ozone regime provided one of the first indicators of the growing degree of centralised lawmaking on environmental issues and a new approach to international environmental negotiation and law despite some of its inherent weaknesses.

CHAPTER III

The Ozone Regime

In this chapter, an effort will be made to give an account of the Ozone Regime and its various provisions. The Ozone Regime for the purpose of this paper comprises of the Vienna Convention (1985), the Montreal Protocol (1987) and the London Amendments (1990), the Copenhagen Amendments, 1992 and the Bangkok Meet, 1993. This study will provide a basis for the critical evaluation of this legal structure in the following chapter.

3.1 The Vienna Convention

The Vienna Convention for the Protection of the Ozone Layer was adopted by forty three countries in March 1985. It entered into force on 22 September 1988.[1] It was the result of lengthy negotiations and repeated revisions of its draft text.[2] It was the first legal instrument on the depletion of the ozone layer. Early diplomatic action in this case, was coordinated by the United Nations Environment Programme (UNEP).[3]

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1. Richard Elliot Benedick, **Ozone Diplomacy :New Directions in Safeguarding the Planet**,(Harvard Univ. Press: Cambridge. Massachusetts and London, England,1991), p.214,216

2. See ibid, chapter IV, pp. 40-50.

3. Alexander Wood, ?"The Interim Multilateral Fund for the Implementation of the Montreal Protocol", The **Global Environment Facility,** World Wildlife Fund, 1991, p.80.

The parties to this anticipatory Convention[4] accept the general obligation to take appropriate measures towards the protection of human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer.[5] The Convention lays down that states shall adopt these measures to control, limit, reduce or prevent such activities occuring under their jurisdiction[6], in accordance with the means at their disposal and their capabilities.[7] Besides a separate provision that urges cooperation in defined areas of research and scientific assessment[8], the Convention mandates cooperation in the exchange of relevant

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4. The Vienna Convention for the Protection of the Ozone Layer, opened for signature, March 22,1985, U.N.Doc. UNEP/1 G.53/5/Rev.1, 26 **International Legal Materials** (I.L.M.) 1529,1986. It entered into force September 1,1988 (hercinafter Vienna convention). Also reprinted in Richard Benedick, n.1,pp.218-29. See The preamble to the Convention, ''Mindful of the precautionary measures for the protection of

5. ibid, Article 2(1).

6. ibid, Article 2(2) (b), This provision articulates a generally accepted rule of customary international law ie. Principle 21 of the Stockholm, Declaration of the United Nations Conference on the Human Environment, U.N. GAOR U,N.Doc. A/Conf.48/14/Rev. 1(1973), UN Pub No. E. 73 II a . 14(1974), See chapter I of this dissertatio.

7. See n.4, Article 2(2) (b).

8. ibid, Article 3.

scientific, technical, socio-economic, commercial and legal information with special consideration to the needs of developing countries.[9] An institutional arrangement, at two levels, is established by the Convention which comprises a secretariat[10], which is to function as a permanent administrative body and a Conference of Parties, which is regularly convened.[11] The Conference of Parties has a broad mandate.[12] It is to keep under review the implementation of the Convention.[13] Additionally, it is to promote harmonisation of the policies, strategies and measures for minimising the release of harmful substances[14], adopt programmes for research, systematic observations, scientific and technological cooperation, exchange of information and the transfer of technology and knowledge.[15] It may further, consider and adopt amendments to the Convention[16] or to any

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9. ibid, Article 4.
10. ibid, Article 7.
11. ibid, Article 6.
12. ibid.
13. ibid, Article 6(4).
14. ibid, Article 6(4) (c).
15. ibid, Article 6(4) (d).
16. ibid, Article 6(4) (e).

protocol.[17] It may also adopt additional annexes[18] and subsidiary bodies if deemed necessary for the implementation of the Convention.[19] Thus, the Conference of Parties can consider and take any additional action that may be needed for fulfilling the purposes of the Convention.[20]

The Convention, with its application to the Protocol has very limited provisions for dispute settlement.[21] In the event of a dispute concerning interpretation or application of a provision, the parties shall seek redressal by negotiations;[22] and failing that, shall submit their dispute to either mediation[23] or to conciliation.[24] However,at the time of acceding to the convention, some parties may choose to declare in writing that in case their dispute is not resolved by other means, they accept either arbitration[25] or submit to the International Court of Justice or both.[26]

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17. ibid, Article 6(4)(f).
18. ibid, Article 6(4) (g).
19. ibid, Article 6(4) (i).
20. ibid, Article 6(4) (k).
21. ibid, Article 11.
22. ibid, Article 11(1).
23. ibid, Article 11(2).
24. ibid, Article 11(4).
25. ibid, Article 11(3) (a).
26. ibid, Article 11(3)(b)

The Convention failed to set any reduction or control schedules, setting obligations which are very general in nature. So much so, that it even omitted any definition of ozone depleting substances (ODS). Moreover, it has neither defined responsibility nor regulation. Thus, there was a conspicuous lack of regulatory provisions, attributable to scientific uncertainty, general lack of political will and disagreements concerning control measures.[27] Being a non-legal response, the convention did achieve in creating an atmosphere of international cooperation, enabling a more stringent set of provisions at a later date. Evidence of this, was the adoption of the Montreal Protocol, two years later, without much difficulty.[28]

> In the tradition of a substantial body of international environmental law, it (the Vienna Convention) is in fact a framework treaty, representing a core of common agreement, to be strengthened and refined with subsequent annexes and protocols - thereby evolving a response to improved knowledge and changing policy options."[29]

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27. See Benedick, n.1, Chapter VI, pp. 68-76.

28. Bryec Blegen. "International Cooperation in Protection of Atmospheric Ozone: The Montreal Protocol on Substances that Deplete the Ozone Layer", **Denver Journal of International Law and Policy,** vol. 16,2,3, 1988. p.417.

29. Anne Gallagher, ''The New Montreal Protocol and the Future of International Law for Protection of the Global Environment'', **Houstion Journal of International Law,** vol. 14(2), Winter 1992, p.281.

3.2 The Montreal Protocol

The Provisions of The Montreal Protocol on Substances That Deplete the Ozone Layer impose a variety of controls and provide a more stringent set of measures towards the protection of the ozone layer.

[A] Substantive Provisions : An Overview

In addition to the Convention provisions, the Montreal Protocol limits the production and consumption of controlled substances.[30] It lists these substancees[31] and defines how to calculate control levels.[32] It lays down trade restrictions[33], grants special concessions to developing countries[34], provides for a periodic review and assessment, of control measures[35] and incorporates financial provisions too.[36] The issue of non- compliance is however left to

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30. The Montreal Protocol on Substances that Deplete the Ozone Layer, opened for signature September 16,1987, 26. **I.L.M,** 1541 (1987). It entered into force January 1, 1989 (hereinafter Montreal Protocol). Also reprinted in Benedick, n.1,pp.230_41, Article 2.

31. ibid, Annex 1.

32. ibid, Article 3.

33. ibid, Article 4.

34. ibid, Article 5.

35. ibid, Article 6.

36. ibid, Article 13.

parties to consider and approve procedures and institutional mechanisms.[37]

(a) Control Measures for Ozone Depleting Substances

The Montreal Protocol is the first international agreement which laid down specific obligations for pollution reduction on participating nations.[38] In accordance with Article 2, Parties to the Protocol agree to freeze and then reduce their production and consumption of certain restricted chemical substances. These are five chloro-florocarbons specified in Group I to Annex A and three halons in Group II of Annex A.

The Protocol also provides a time schedule for the freeze and reduction. The prodution and consumption of the chloroflmorocarbons was to freeze at 1986 levels from July 1, 1990, be out by twenty percent by 1994 and then further reduced to fifty percent of 1986 levels by June 30. The production and consumption of halons were not dictated by this reduction schedule, but their production and consumption was to freeze at their 1986 levels.[39] However, the production of both groups (CFC'c and halons) were

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37. ibid, Article 8.

38. Roberta Dohse, ''Global Air Pollution and the Greenhouse Effect: Can International Legal Structures Meet the Challenge?'', **Houston Journal of International Law**, vol. 13, 1990,p. 203

39. See the Montreal Protocol, n.30,Article 2.

allowed by the Protocol to rise by a predetermined percentage for "industrial rationalisation[40] or to fulfil the "basic domestic needs" of developing state parties.[41]

(b) Exceptions to the Rule

The Protocol, in order to invite greater acceptance provides for a variety of exceptions to the general control schedule.

A state party which does not fall in the developing country[42] category, has facilities for the production of controlled substances under construction, (or contracted for)[43], and has been provided for in the national legislation [44], may add production.[45]

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40. ibid, Article 1(8), Industrial rationalisation is the "transfer of all or a portion of the calculated level of production of one Party to another for the purpose of achieving economic efficiencies or responding to anticipated shortfalls in supply as a result of plant closures.

41. ibid, Article 2(2). Interestingly, individual nations could decide their own reduction and freezing strategies since nowhere does the Protocol mention it.

42. ibid, Article 5.

43. ibid, Article 2(6), prior to September 16, 1987.

44. ibid prior to January 1, 1987.

45. ibid. Such added production should not raise the party's annual calculated level of consumption of the controlled substances above 0.5 Kilogram. per capita. Also see Bryce Blegen. n.28, p. 418. This article allowed the completion of CFC production facilities by the Soviet Union, in accordance with its already drawn up five year plan. It also allows for

Secondly, state parties which are member states of a regional economic integration organisation[46] may decide on jointly fulfilling their obligation regarding consumption, as long as their aggregate calculated levels do not surpass required levels.[47]

Thirdly, small producers of CFCs are allowed to cooperate to distribute procuction between themselves, their aggregate production not exceeding prescribed controls.[48]

Fourthly, developed countries may exceed their eighty percent production limits by up to ten percent, if this

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additional production from such facilities to be counted as part of the 1986 production and consumption. This article was inserted to accomodate the Soviet Union and other planned economies to accept the Protocol.

46. See the Vienna Convention, n.4. Article 1(6). A Regional Economic Integration Organisation means an "organisation constituted by sovereign states of a given region which has competence in respect of matters governed by this convention or its Protocol and has been duly authorised, in accordance with its internal procedures to sign, ratify, accept, approve or accede to the instrument concerned.''

47. See the Montreal Protocol, n.30, Article 2(8). Also see Bryce Blegen, n.28, p. 48 . This article allows the European Community (now union)members to meet the general requirements of Article 2 as a whole, if each of them ratifies the Protocol individually. This is another example of how a large community of European nations was made more amenable to join the Protocol.

48. ibid, Article 2(5).

surplus production is needed for developing country advancement purposes.[49]

Lastly, but most importantly is the developing country exception. The preamble to the Protocol acknowledged that special provisions are required to meet the needs of developing countries.[50] The Protocol provides for the developing countries[51] to avail of a special concession of deferring compliance upto ten years. As long as their consumption level does not exceed the maximum level[52] set by the Protocol, a developing country may increase its production and consumtion levels above its 1986 levels. This special entitlement is in order to meet its basic domestic needs.[53] Developing countries, under the ambit of Article 5 are also entitled for assistance and access to

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49. ibid, Article 2(3). The term ''developing country" is however not defined .

50. ibid, See Preamble. It acknowledges that special provision are required to meet the needs of developing countries.

51. ibid, Article 5(1). It sets an implied criteria to define developing countries for the purpose of the provision. It reads: ''any Party that is a developing country and where annual calculated level of consumption of the controlled substances is less than 0.3 Kilograms per capita on the date of entry into force the the Protocol."

52. ibid, 0.3 kilogram per capita.

53. ibid, Article 5(1).

environmentally safe alternative substances and technologies by other parties.[54] The parties undertake to facilitate the provision of financial support by way of subsidies, aid, credits, guarantees or insurance programmes to Article 5 parties, for the use of alternative technology and substitute products.[55]

The developing country parties to the Protocol have been also given a special standing where research, development, public awareness and exchange of information are concerned. However, the parties are take into account the needs of developing countries insofar as they are consistent with the national laws, regulations and practices of the cooperating parties.[56] The same condition is applicable to the provision for technical assistance to developing country by parties.[57]

These provisions are to facilitate wider participation from countries and thus increase the possibility of greater implementation.[58] Moreover, countries that do not

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54. ibid, Article 5(2).

55. ibid, Article 5(3).

56. ibid, Article 9(1).

57. ibid, Article 10(1).

58. See James T.B. Tripp,''The UNEP Montreal Protocol: Industrialised and Developing Countries Sharing the Responsibility for Protecting the Stratospheric Ozone

participate are penalised by trade restrictions, as is discussed in the following section.

(c) Controlling Trade with Non-parties

Article 4 of the Protocol sets out a strict import control program in three steps, and a more liberal stance concerning export of controlled substances and related goods from parties to non-parties.

The first step of the import control lays a ban on the import of controlled substances from nonparties. This must be acheived by parties, within one year of the entry into force of the Protocol.[59]

The next stage is a ban on the import of products that contain controlled substances[60] from non-parties, within four years of the entry into force. Within three years of

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Layer, **New York University Journal of International Law and Policy,** vol.20, 1988. p. 744. Although the Protocol recognised the needs of Less Developed Countries (LDC's) it does not lay down many specific provisions for this purpose. This led to a position of insecurity amongst the LDCs questioning if the monetary and technological assistance would be substantial and adequate. This was also a major reason for the refu

59. Montreal Protocol, n.30, Article 4(1).

60. For example. airconditioners and refrigerators.

the entry into force, a list of banned products for import is to be drawn up by parties in an annex.[61]

The last type of products subject to the import ban are these which are made with controlled substances but no longer contain it. Within five years of the entry into force of the Protocol, the parties are to ban these products, if determined "feasible" by the parties. Then the parties are to elaborate the list of restricted products in an annex.[62]

In the case of export provisions, while developing countries are clearly prohibited from exporting controlled substances to non-parties,[63] there is no such provision for a developed country with a non-party. Infact, the developed countries are to "discourage" export of technology for the production and utilisation of controlled substances.[64] The Protocol requires each party to refrain from any financial assistance[65] to non-parties, of products, technology or

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61. The Montreal Protocol, n.30. Article 4(3). For the procedural mechanisms of creating annexes, the Protocol relies on the Convention. The adoption of an annex requires a two -thirds majority vote of parties present and voting. See also Vienna Convention, n.4. Article 9 and 10.

62. Montreal Protocol, n. 30, Article 4(4).

63. ibid, Article 4(2).

64. ibid, Article 4(5).

65. ibid, Article 4(6).

equipment which aids in the production of controlled substances.[66] It may however render assistance to products, equipment and technology that improve the recovery, recycling, containment or destruction of controlled substances or promote the development of alternative substances.[67]

(d) Other Provisions

The Protocol provides for a periodic assessment of control measures on the basis of current scientific, technical, environmental and economic information. On the basis of this imformation, control schedules may be adjusted.[68] The Protocol also provides for the research and exchange of information on the ozone problem.[69] It provides for an exchange of scientific and technical information related to the goals of the Protocol[70] and convenes regular meetings to assess and discuss implementation.[71]

The provisions of the Montreal Protocol, despite some

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66. ibid.

67. ibid, Article 4(7).

68. ibid, Article 6.

69. ibid, Article 9.

70. ibid, Article 10.

71. ibid, Article 11.

shortcomings[72], do incorporate many innovative tools and techniques to various problems. It is for this reason that the Protocol is considered a vital move in the development of international environmental law and a pracident for other environmental problems. At the Helsinki Declaration meet[73] it was decided to further strengthen and modify the Protocol with some amendments and revisions to the Protocol by the London Amendments 1990.

3.3 The London Amendments and Adjustments

A number of outstanding issues were dealt with at the London meet of 1990. Certain amendments were made which added to the legal instruments effectiveness.

(a) Control and Reduction Schedule

The control schedule was significantly accelerated in the London Amendments. Chlorofluorocarbons were now to freeze at 1986 levels, be reduced by 50% in 1995 and by 85% in 1997. It provided for the Group I CFC's[74] to be phased

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72. The main weakness of the Protocol is its weak monitoring and compliance mechanism.

73. At the Helsinki meet, two major issues were raised. Firstly, that due to the rapidly depleting ozone layer, there must be the elimination of all ozone depleting substances by the end of the century. Secondly, that an international fund must be established to generate, subsidise and transfer new technologies and products to developing countries. See R. E. Benedick, n. 1 p. 125.

74. The Montreal Protocol, n.30, Annex A, Group I Substances: CFC's 11, 12, 113, 114, 115.

out by the year 2000, and this entire schedule was to be reassessed in 1992, with the idea of further accelerating reductions.[75]

Group II Halons[76] were to now freeze at 1986 levels in 1992 as earlier, but were to be reduced by 50% in 1995, and a complete phase out by the year 2000.[77] It also provided for a subsequent review where parties were to decide if any essential uses were to be exempted from reductions.[78] The Article also permits certain exceptions which are necessary to "satisfy essential uses for which no adequate alternatives are available"[79] and in order " to satisfy the basic domestic needs of the developing parties who are allowed to exceed limits by up to ten percent of its 1986 levels.[80]

The amended Protocol has incorporated an expanded coverage of "controlled substances". It extends its coverage

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75. Report of the Second Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, U.N. Doc. UNEP/Oz L. Pro. 2/3, 1990 (June 29, 1990), (hereinafter London Revisions). Article 2 A.

76. The Montreal Protocol, n. 30, Annex A, Group II substances, Halons 1211, 1301, 2402.

77. The London Revisions, n.74, Article 2B.

78. ibid, Article 2 B(4).

79. ibid, Article 2 B (2).

80. ibid, Article 2B (1).

to other fully halogenated CFC's and two other major ozone depleting chemicals, carbon-tetra-chloride and methyl cholroform

The fully halogenated CFC's, according to the amendments were to reduce by 20% from 1986 levels in 1993, by 85% from 1997 and a completely phase out in 2000.[81] Carbontetrachloride, was to reduce by 85% from 1989 levels in 1995 and to zero in the year 2000[82] Methyl chloroform was to freeze at 1989 levels in 1993, reduce by 30% in 1995, show a 70% reduction in 2000 and phase out in 2005. This schedule was subject to reassessment for acceleratcd reductions.[83]

Excluded from the expanded list of controlled substances are other halons and hydrochlorofluoro-carbons. In Annex VII, under a non-binding resolution, Parties are to discourage usage and are to report on the consumption and production of other halons.[84] HCFC'c too fall under a nonbinding resolution for phase out by 2040 and if possible, by 2020, with periodic reassessments. It, however calls for mandatory reporting on its production and consumption.[85]

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81. ibid, Article 2 C.

82. ibid, Article 2 D.

83. ibid, Article 2 E.

84. ibid, Annex VII (I).

85. ibid, Annex VII (II).

(b) The Financial Mechanism

In lieu of the Protocol provision, whereby parties were to facilitate bilateral and multi-lateral aid to developing countries, the London Revisions created an Interim Multilateral Fund for the purpose of financial assistance to developing countries.[86]

The Fund is to operate from January 1, 1991 through December 31, 1993 or until a permanent fund is established. The urgent necessity of setting up a funding mechanism which was missing in the Protocol, compelled parties to refer to it as an "Interim" fund.[87] A permanent format for the Fund

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85. ibid, Annex VII (II).

86. Simultaneously,the World Bank was finalising drafts of the Global Environment Facility(GEF),a 1.2 billion dollar fund to provide grants aid and assistance to developing countries for industrial reforms. This Fund, created in 1990 was to address ozone depletion, global warming, loss of biodiversity and oceanic pollution. More so, in November 1990, eighteen industrialised and seven developing countries agreed to set up a Global Environment Trust Fund (GET) to finance other focal areas. Besides, there was an Ozone Projects Trust Fund (OTF) which was to be used by the World Bank to finance projects. It was further agreed that the administration of the GET and the OTF would be under the GEF. So, while the OTF was a World Bank Venture, the Interim Fund is part of the Protocol.

87. At the Fourth Meeting of the parties of the Montreal Protocol convened in November 1993 in Copenhagen, the Multilateral Fund was finally established. See. Fourth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, UNEP/OzL. Pro. 4/1 (23 November 1993)

was to be developed by improving the structural, functional and operational costs based on suggestions from and agreement by parties.[88]

The Interim Fund, referred to as the Multilateral Fund[89], along with an Executive Committee[90] consititutes the Interim Financaial Mechanism.[91] It is to provide financial and technical cooperation, including technology transfer to developing country parties to enable their compliance with control measures.[92]

The Fund is financed by contributions from parties, excluding developing countries. The United Nations scale of assesment is to lay down the amount of contributions to the Fund.[93] Contributions are to be made in addition to any other financial transfers to Article 5(1) parties.[94] However, bilateral and regional cooperation may, in some

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88. Jason M. Patlis, " The Multilateral Fund of the Montreal Protocol : A Prototype for Financial Mechanisms in Protecting the Global Environment", **Cornell International Law Journal**, vol.25, 1992, p.200

89. The London Revisions, n.74, Article 10 (2).

90. ibid, Article 10 (5).

91. ibid.

92. ibid, Article 10 (1).

93. ibid, Article 10 (6).

94. ibid, Article 10 (1).

circumstances,[95] be considered upto a percentage as a contribution to the Fund.[96]

The Fund is to finance certain "clearing house functions[97] such as helping the Article 5(1) parties to pinpoint their needs for cooperation by conducting country specific studies.[98] It may also facilitate technical cooperation[99], distribute information and relevant materials, hold workshops, training sessions and other relatied activities.[100] It may also facilitate and monitor any other bilateral, regional or multilateral cooperation available to Article 5(1) countries.[101]

With an initial capitalisation of 160 million dollars, the interim Fund could be raised to 240 million dollars

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95. ibid, Article 10 (6) , For bilateral and regional cooperation as a part contribution to the Fund, it should :
    (a) relate to compliance with protocol provisions.
    (b) provide additional resources.
    (c) meet agreed incremental costs.

96. ibid, Article 10(1).

97. ibid, Article 10(3) (b).

98. ibid, (b) (i).

99. ibid, (b) (ii).

100. ibid, (b) (iii).

101. ibid, (b) (iv).

during the three year period when the Protocol gained wider participation.[102]

The overall administration, supervision and disimbursement of resources of the Fund[103] is done by the fourteen member executive committee[104] in cooperation with implementing agencies; such as the United Nations Envirionment Programme (UNEP), the United Nations Development Programme (UNDP). the International Bank of Reconstruction and Development (IBRD ; World Bank)[105] and other agencies.[106] Interestingly, decisions on financial mechanism require an approval by two thirds of parties comprising separate majorites of industrialised countries

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102. ibid, Annex IV, Appendix IV: Terms of Reference for the Interim Multilateral Fund. Also see, Alexander Wood, n.3, pp. 88-89. The ratification of the Protocol by China, considered the largest potential consumer and producer of Ozone Depleting Substances (ODS) among developing countries, is directly related to the creation of the Interim Multilateral Fund. Even lndia's recent ratification of the Protocol was for the same reasons.

103. The London Revisions, n.74, Annex IV, Appendix IV, B (2).

104. ibid, Annex IV, Appendix II (2): Terms of Reference of the Executive Committee.

105. See Alexander Wood, no.3, p.85. The UNEP transfers funds to the OTF from the Interm Multilateral Fund when the projects are approved. The World Banks's GEF, then uses these funds for expenses incurred

106. See the London Revisions, n.74, Annex IV , Appendix IV, B(3).

and Article 5(1) parties.[107] The Fund is meant to serve as a form of reallocation of resources and transfer of technology during efforts towards the protection of the ozone layer. Thus, the Fund represents a crucial move towards equitable economic development coupled with goals of global protection of the environment.[108]

(c) Trade Restrictions

The most significant amendment concerning trade is the export ban on controlled substances being extended to all parties, not only developing country parties.[109]

For new controlled substances, new deadlines were set. Imports from nonparties of new controlled substances was to be prohibited by 1993[110] and of products containing new controlled substances by 1996.[111] for products made with new controlled substances, parties were to determine feasibility of the ban within five years of the date of entry into force, ie 1997.[112]

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107. ibid, Article 10(9).

108. See Jason M. Patlis,n. 88, p. 200.

109. ibid, Article 4(2) and article 4(2 bis).

110. ibid, Article 4, para 1 bis.

111. ibid, Article 4, para 3 bis.

112. ibid, Article 4, para 4 bis.

The provisions regading export of technology to non parties was more strongly worded in the London Revisions text. A commitment to "discourage" such export "to the fullest practicable extent" [113] was made, unlike the earlier wording of merely "discouraging" such export.[114]

(d) Developing Countries

As the Protocol provision spell out, even under the London amendments, developing countries are entitled to delay compliance with control measures by ten years in order to meet its basic domestic needs.[115] There is no change in the consumption limits of controlled substances for CFC's and halons. For new controlled substances, however, the limit now is 0.2 Kilogram per capita.[116] If financial aid or technology transfer are considered inadequate to enable compliance, Article 5(1) parties may appeal to the meeting of Parties.[117] Subsequently, Parties are to "take every practicable step" to transfer technology to Article 5 Parties under" fair and most favourable conditions[118] The Protocol provisions were less commiting.

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113. ibid, Article 4 (5).

114. The Montreal Protocol, n.30, Article 4(5).

115. The London Revisions, n 74, Article 5(1).

116. ibid, Article 5(5-9).

117. ibid, Article 5 (4).
118. ibid, Article 10 a, Annex II.

(e) Implementation

In response to the Protocol loophole, an Implementation Committee was established to review complaints in case of non compliance and attempt a resolution of the matter. These proposals were, however, of an interim nature while parties seek more detailed procedures by legal experts.[119]

3.4 The Copenhagen Amendment and The Bangkok Meet

At the Fourth Meeting of the Parties to the Protocol in Copenhagen in November 1992, the further adjustments and reductions and further amendment to the Protocol was approved.[120] These adjustments and reductions were to enter into force on 22 September 1993 for all parties.[121] One of the most striking progressions in this meet was the establishment of a Multilateral Fund, since 1 January 1993. The Fund Secretariat was to be at Montreal, Canada and the Fund was to operate under guidelines applicable to the Interim Multilateral Fund.[122] Issues regarding budget and financial matters, contributions to the Fund etc. were discussed.

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119. ibid, Annex III, Also see, Anne Gallagher, n, 29, p. 305.

120. See UNEP/OzL. Pro. 5/2 (7 September, 1993), p.10.

121. In accordance with provisions of Article 2, 9(d) of the Protocol.

122. See n.120, p.13.

Later, the Fifth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer was held in November 1993 at Bangkok, Thailand to review the status of implementaion of the Montreal Protocol and the possible implementation of various proposals for further action put forth by the Fourth Meeting.[123] For this purpose, the fifth meeting of the parties discussed a wide range of issues : (i) The status of ratification ; and urged all countries which had not yet approved or ratified the Protocol.[124] (ii) It also discussed the implementation of the Protocol by the parties in terms of data reported by them. The report clearly showed that the Protocol implementation by parties that have reported data was found to be very encouraging. On the other hand, not all parties were reporting such data, which undermines the strength of the excellent response of parties to ozone depletion. The Meeting urged all parties to report to data considering it a legal obligation.[125] The Implementation Committee was to consist of ten parties elected for two years, based on equitable geographical distribution.[126] (iii) This Meet drew a provision to relax the control of trade to non-

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123. ibid, p.1.

124. ibid.

125. ibid, p.2.

126. ibid.

parties (by Article 4 of the Montreal Protocol) which report their data to the Secretariat before 31 March 1993 in accordance with Articles 2, 2A to 2E and 4 of the Protocol.[127] (iv) The Fifth Meeting also reviews the status of certain parties vis a vis Article 5 of the Protocol in response to the submitted data, for which a revised format was approved.[128] (v) The Bangkok Meet also drew up a three year plan and budget of the Multilateral Fund for the period 1994-96, and worked details on selection of the Executive Committee members etc.[129]

3.5 Conclusion

A study of the legal response to the ozone problem highlights the appreciable attempts of the international community to formulate an appropriate and effective regime to counter a potentially grave environmental problem.

Proceeding from a general skeltal framework to the specifics, various innovations in rule creation and implementation have been incorporated in the process of international lawmaking for the ozone problem. The Ozone Regime is often viewed as a prototype for future international environmental lawmaking. The normative features incorporated in this regime will be elaborated in the next chapter, alongwith some emerging trends in international environmental law.

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127. ibid.
128. ibid.

CHAPTER IV

AN EVALUATION OF THE OZONE REGIME

By setting some valuable precedents in international lawmaking, diplomacy and statesmanship, the Ozone Regime and the series of negotiations that led to its successful completion have been viewed as a paradigm for future efforts in responding to a global environmental challenge.[1] Overcoming the seemingly formidable obstacles arising out of complex issues and divergent stands, a balance was struck in evolving a new form of international cooperation and mutuality of interest.[2]

In this chapter, an effort will be made to highlight some of the innovations in rule making and implementation, as incorporated in the Ozone Regime. The success and

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1. Annette M. Capretta, "The Future's So Bright, I Gotta Wear Shades: Future Impacts of the Montreal Protocol on Substances That Deplete the Ozone Layer", **Virginia Journal of International Law**, vol. 29 (1), Fall 1988, pp. 247-48.

2. David Mitrany, **A Working Peace System**, (Quadrangle Book: Chicago, 1966), pp. 378-80,
Mitrany affirms that a problem of peace should not be approached by areas of national conflict but by "binding together those interests which are common where they are common, and to the extent to which they are common." Mitrany suggests a horizontal approach, cutting across national boundaries for social need , as different from the vertical divisions of human society marked by sovereignty of states. This functional approach of Mitrany could be applied in the case of environmental issues.

shortcoming of these normative lawmaking techniques, can serve as guidance for other environmental problems.

4.1 Normative Rule Creation

The predominant legal method for addressing transboundary environmental challenges are international environmental agreements. The novelty of trend apparent in the Ozone Regime is a visible deviation from the primary focus in traditional rules of international law[3] to a standard-setting approach.[4] This approach broadly implies the codification through an international legal agreement to meet the needs of specific environmental challenges.

For this purpose, one of the methods incorporated successfully in the Ozone Regime has been the "framework convention-protocol" approach or the umbrella treaty

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3. See Jan Schneider, "New Perspectives on International Environmental Law", **Yale Law Journal**, vol. 32, 1973, pp. 165-71. Traditional rules of international law cannot be discarded as irrelevant to resolving environmental issues but do pose many legal difficulties regarding invoking rules of responsibility, liability and compensation. For eg. The Chernobyl nuclear disaster 1986. See Ved P. Nanda and Bruce C Bailey, "Export of Hazardous Waste and Hazardous Technology : Challenge for International Environmental Law", **Denver Journal of International Law and Policy**, vol. 17 (1), 1988, p. 170-76.

4. Anne Gallagher, " The "New" Montreal Protocol and The Future of International Law for Protection of The Global Environment", **Houston Journal of International Law**, vol. 14 (2), Winter 1992, p. 332.

approach.[5] Unlike the Law of the Sea Convention negotiations, the ozone response prevents issue linkages by adopting this convention-protocol approach. As a result, it is possible to avoid an unmanageably cumbersome document in hand.[6] The Vienna Convention acted as the framework convention for the ozone problem and a first step in the process of creating more stringent and enforceable legal norms by subsequent protocols. Thus the Vienna Convention laid down a broad array of general principles involved, whereas the Montreal Protocol and its subsequent amendments elaborated on the details of each. This sort of approach aided in developing an initial consensus on the broad issues involved, encouraging wider participation and cooperation among states. In fact it is a response to some characteristic obstacles in the way of creating environmental agreements.[7]

This, however, does not imply applicability of the convention-protocol approach to any issue. If does have some inherent weaknesses. Firstly, although it gives the impression of facilitating an agreement in a shorter time

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5. For detailed discussion see also. Chapter I of this dissertation.

6. "Developments-International Environmental Law", **Harvard Law Review**, vol. 104, 1991, p.1544.

7. ibid.

frame, it actually can be deceptive.[8] It requires two rounds of ratification before it enters into force and acquires legality. As a procedural strategy, The Montreal Protocol, however, contains provisions that help in decision-making in the absence of unanimity and avoiding possible delays in terms of time. If consensus is not reached, a two-thirds majority present and voting, can adopt adjustments to the Protocol control schedule.[9] In fact, the London Revisions add that this two-thirds majority is to represent a majority of both Article 5(1) and non Article 5(1) parties, reflecting a changed vision of consent.[10] The decisions then reached are binding on all parties[11] leaving no scope for any reservations[12] unless the party concerned withdraws from the entire convention.[13] Therefore, varying from case to case, this drawback may or may not undermine

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8. ibid, p.1543.

9. The Montreal Protocol on Substances That Deplete the Ozone Layer, opened for signature September 16, 1989, 26 **International Legal Materials**, (I.L.M.) 1541, 1987. It entered into force on January 1, 1989 (hereinafter Montreal Protocol) See Article 2 (9).

10. Report of the Second Meeting of the Parties to the Montreal Protocol On Substances that Deplete the Ozone Layer, U.N. Doc. UNEP/Oz L. Pro. 2/3, 1990 (June 29, 1990), hereinafter London Revisions). See Article 2 (9) (c).

11. See the Montreal Protocol, n.7,Article 2 (g)(d).

12. ibid, Article 18.

13. ibid, Article 19.

negotiations. Secondly, this approach may lead to "hold-out" problems where state Parties may join the agreement as "free riders" to reap benefits from it, without ever joining the Protocol, or contributing to the costs of regulation.[14] The Montreal Protocol takes care of this issue by ensuring that state parties to the Convention are bound by subsequent Protocols, unless they choose to opt out of the legal regime.[15]

It is practically not feasible to generalise the possibility of the successful application of this normative approach because each environmental issue is unique in itself. For future policy-making, this convention-protocol approach could be made use of after foolproofing the inherent shortcomings. It could be used, as has been in the ozone case, as a catalyst or stimulant for state action.[16]

4.2 The Precautionary Principle

In addition, the precautionary principle[17] was used. This reflects that the state parties are willing to act in

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14. See n. 6, p. 1544.

15. See the Montreal Protocol, n.7, Article 4 : Control of Trade with Non-Parties. The Protocol has a disincentive structure for non-parties.

16. See, n.6, p.1534-38.

17. For Precautionary Principle, see **Chapter I** of this dissertation.

anticipation of a possible threat without full scientific certainty. This principle has been embodied in a numbers of other declarations too.[18] It rests on the belief that a lack of concrete scientific evidence and data should not be used as a reason for postponing environmental protection measures. Addressing the issues of scientific uncertainty and burden of proof, the precautionary principle is still in its formative stages and has not yet evolved into a uniform practice with legal force or generalisations. Not yet an international (enviromental) custom, this principles is likely to bring vital changes in international environmental law.[19] Cameron and Werksman, however feel that

> If the precautionary principle is to be an effective legal instrument for protecting the environment, it must be conceived of as general in character but capable of devolving to the particular.[20]

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18. For example the UN Economic Conference for Europe (ECE) Bergen Declaration, Norway, 16 May 1990, ASEAN work shop on scientific, Policy and Legal Aspects of Global Climate Change, 20 September 1990, Draft Ministerial Declaration, Second World Climate Change Conference, 13 July 1990 to name a few.

19. James Cameron and Jacob D. Werksman, "The Precautionary Principle : A Policy for Action In the Face of Uncertainty", International Convention on Climate Change", **CIEL Background Papers on International Environmental Law**, 1/1991. (CIEL, School of Law, Kings College, London, 1991), p.7

20. ibid, p.17.

4.3 Legalising Equity

The declaration for the establishment of a New International Economic Order[21] reads :

> confirmation Current events have brought into sharp focus the realisation that the interests of the developed countries and those of the developing countries can no longer be isolated from each other, that there is a close inter relationship between the prosperity of the developed countries and the growth and development of the developing countries, and that the prosperity of the international community as a whole depends upon the prosperity of its constituent parts. International cooperation for development is a shared goal and a common duty to all.[22]

Therefore, an expression of equality,[23] fairplay and

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21. Declaration and Programme of Action, New International Economic Order, Adopted by the sixth special session of the General Assembly of the United Nations, 2229th plenary meeting 1 May 1974, GA resolution 2626 (XXV), The New International Economic Order is to be ''based on equity, sovereign equality, interdependence, common interest and cooperation among all states, irrespective of their economic and Social systems which shall correct inequalities and redress existing injustices, making it possible to eliminate the widening gap between the developed and developing countries"

22. ibid, supra note 3.

23. See, Article 2 (1) of the UN Charter.

cooperation amongst interested parties is a vital indicator of the legitimacy, acceptance and the functional success of any legal regime.

As a move towards an equitable arrangement, the Ozone Regime reflects a legalised representation of the LDC stand point. This move was not solely because of a sense of responsibility by the developed countries to cover the costs of phase out of ozone depleting substances. It was more the result of a realisation that the efforts of the industrialised North would be severely crippled without the participation of the developing Southern countires (which meant seventy five percent of the worlds population).[24] Therefore, in response to the demands set forth by the South, the Ozone Regime equated provisions to meet their negotiating conditionalities, at a level of perceived equality. The developing countries assent was conditional on the willingness of the developed countries to agree on a substantial transfer of resources, both technical and financial.[25] Although the Montreal Protocol did give the

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24. Richard E. Benedick, **Ozone Diplomacy :New Direction is Safeguarding the Planet**, (Harvard Univ Pren, Cambridge, Massachussetts and London, England, 1991),p 151.

25. See Ian H. Rowlands, "The Fourth Meeting of the Parties to the Montreal Protocol : Report and Reflection", **Environment**, vol. 35(6), July /August 1993,p.32 Also see, n.6, 1505. The basis for making this demand was primarily one. The industrialised North had already benefited from making use of these chemicals on a large

developing countries a special position and provisions, the skeptical South[26] did not agree to settle for anything less than specified provisions and a determinate mechanism for financial assistance which had legally enforceable obligation. The South demanded that the contributions towards the ozone response be additional to the existing form of aid.[27] Subsequently, the London Revisions established a Multilateral Fund, meeting the developing

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scale for decades. This was done in the absence of environmental standards for resource exploitations, leading to a threat that attacked the entire planet. Developing countries argued that for a problem resulting mainly from the activities of a select group of nations, why should the south be made to bear the burden. They were apprehensive of the phaseout drive which could invariably have a negative impact on thei

26. Their stand was that of Principle 16 of the Rio Declaration: The Polluter Pays Principle states that: National authorities should endeavors to promote the internalisation of environmental costs and the use of economic intruments, taking into account the approach that the polluter should in principle, bear the cost of pollution,with due regard to the public interest and without distorting trade and international investment. Also see A. Boyle's Making the Polluter Pay? Alternatives to state Responsibility in the Allocation of Transboundary Environmental Costs In International Responsibility to Environmental Harm F. Franconi and T. Scovazzi, eds. 1991 p.361.

27. Richard E. Benedick, n. 19, p. 153. Developing countries required incentives to "leap-frog the CFC phase in their industrial development'' see, Report of The Second Meeting, Supra note 5,para 18.

countries demands.[28]

A striking feature of this regime has been the vital importance given to developing country participation. LDCs have been given a special status in the negotiating process and in the provisions of the regime. Anne Gallagher rightly assessed this feature,

> Participation of LDCs in attempts to resolve these and other issues will continue to be vital. If such participation is only attainable at a price, then it would appear to be in the national interests of those states capable of affording the price to pay it. Such logic was evident in the negotiation-amongst-equals style adopted at Montreal, and even more so in London when the Protocol was revised.[29]

4.4 Financial Mechanism

The financial mechanism of the Ozone Regime represents a crucial move towards environmental protection, simultaneously keeping in mind the pressing need for an economic development that is fair and equitable This

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28. See, London Revisions , Article 10 and Annex IV appendix IV

29. Anne Gallagher, n.4, p. 358.

mechanism establishes a precedent that may be encorporated in subsequent international environmenmtal agreements.

> It established an important precedent that cuts across international law and politics and environmental law and economics. Regardless of its inherent strengths and weaknesses, its greatest significance lies both in the recognitions and acceptance by industrialised countries that developmental and environmental problems in LDC's are not only casually related but globally relevant, and that such problem must be solved through new legal, political and economic regimes of international cooperation encouraging participation.[30]

4.5 Encouraging Participation

Another distinctive feature of the Ozone Regime is its goal of achieving maximum participation of states keeping in mind the nature of the problem. A response without widespread participation would be an exercise in futility. For this purpose various 'compromise provisions'[31] were

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30. The identified weakness regarding the Financial Mechanism of the Protocol are related to its administrative and institutional arrangements, and most importantly implementation. See Alexander Wood , The Interim Multilateral Fund for the Implementation of the Montreal Protocol, **Global Environmental Facility**, 1991.

31. Annette M. Capretta, n.1, p. 233

chalked out to facilitate greater participation and the implementation of the legal response. These provisions not only provide incentives for participation but also disincentives for non-parties.

Infact, special provisions have been incorporated for developing countries[32], Regional Economic Integration Organisation[33], parties who have facilities for production of controlled substances under construction[34], and parties whose levels of controlled substances production was considerably low in 1986.[35] The inclusion of these provisions was an incentive to maximise prospects of participation. As a non incentive, while parties to the regime were allowed to trade the controlled substances with each other, during the phase out period, there were many restrictions on such trading between parties and non parties.[36] In addition, the Protocol discourages expansion and encourages the development of safe substitutes for CFCs.[37]

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32. The Montreal Protocol, n.7. Article 5,

33. ibid, Article2(8) (a).

34. ibid, Article 2(6).

35. ibid. Article 2 (5).

36. ibid, Article 4. Also see London Revisions , n.8, Art 4.

37. Annette M. Capretta. n.1, p. 233,235.

The incentive network set up by the Protocol is closely connected. The goal of substitute development will depend on the market for these new chemicals. This will in turn, depend on the number of countries that want to phase out CFCs and turn to substitutes. Countries which are party to the Protocol would thus be the potential buyers of these substitutes, unless non participating countries decide on phase outs too! The implementation of the trade restriction provisions, together with the availability of inexpensive substitutes will finally dictate the success of this incentive structure.[38]

4.6 Enforcement

The enforcement provisions in the Protocol are not particularly developed. The main instrument for monitoring and enforcement is the provision for reporting of of statistical data (by parties) a on its production, imports and exports of controlled substances.[39] The revised requirements even require a breakup of the uses of these produced substances.[40] However, not all parties adhere to

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38. ibid, p. 237.

39. The Montreal Protocol, n.7, Article 7.

40. The London Revisions, n.8, Article 7.

41. David D. Caron, "Protection of the Stratospheric Ozone Layer and the Structure of International Environmental Lawmaking, **Hastings International and Comparitive Law Review**, vol. 14, no,3, Spring 1991, p. 772.

this requirement of preparing and submitting authentic and updated data on their use (or misuse) of controlled substances.[41] The Protocol parties were to consider and approve procedures and institutional mechanism for determining non-compliance with the provisions of this Protocol and for treatment of parties found to be in non-compliance.[42]

The interim non compliance provisions developed do not provide for very stringent norms regarding implementation. It provides for parties who have reservations concerning implementation by other parties to communicate these complaints to the secretariat in writing. These concerns are then put forward to an Implementation Committee by the secretariat. The Committee shall then work towards reaching an amicable resolution.[43] But what weakens the entire structure further is the right of parties to the agreement to reject a dispute settlement procedure that is binding.[44] The worth of all these efforts for ensuring compliance will prove piecemeal unless a foolproof means of evaluating 'compliance' and 'identifying' is reached.

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42. The Montreal Protocol, n. 7, Article 8.

43. The London Revisions, n.8, Annex II, p. 12

44. The Vienna Convention for the Protection of the Ozone Layer, opened for signature March 22, 1985, U.N. DOC. UNEP/ 1 G. 53/5/Rev. 1, reprinted in 26, I.L. M., 1529, 1986, entered into force on September 1.

4.7 Conclusion

In conclusion the Protocol's experience has been of crucial significance, not only because of some normative features that are encaporated skillfully, yet not so successful; but also because it represents a new era of accepting common responsibility for saving a jeopardised "common". Meanwhile, the Ozone Regime may be entering a new phase-one no longer concerned with how the regime might be formed but, rather, how it might be strengthened and maintained.[45]

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45. Ian H. Rowland ,n.20. p. 31.

CHAPTER V

CONCLUSION

In this study, an attempt was made to highlight some trends in international environmental lawmaking with special reference to the ozone crisis, which is global in nature. A reflection on the international efforts to protect the ozone layer highlights the emerging structure of international environmental lawmaking. In the words of Wolfgang E. Burhenne, trends in environmental law :

> determine the constellation of issues to be resolved for a particular environmental problem and the alternative substantive and procedural approaches for resolving them. On the basis of such an examination, one can develop guidelines for coherent policy decisions for managing the problems. These decisions must be made by those attempting to devise a system of legal management as well as those who have tried to solve similar problems.[1]

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1. Wolfgang E. Burhenne in Michael Bothe(Project Coodinatior), "Trends in Environmental Policy and Law, **IUCN Environmental Policy Law Paper**, no.15, (Gland, Switzerland, 1980), Preface p.v.

Moreover, a study of the Ozone Regime has, as many believe, proved to be "a paradigm for new diplomatic approaches to new kinds of international challenges."[2]

Attempting to overcome economic, technological, scientific and political barriers, it offers lessons for responding to and dealing with similar environmental issues in the future. The main message that it seems to convey is that traditional boundaries of national interest and state responsibility should be replaced by global interest and global responsibility considering the scope and scale of the global impacts of most environmental issues. The interrelatedness of environmental activities has made international cooperation a constant theme for all enviromental issues.[3]

The ozone experience suggests some emerging factors of a new kind of lawmaking and diplomacy for addressing similar environmental threats. It was realised that conventional

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2. Richard Elliot Benedick, **Ozone Diplomacy: New Directions in Safeguarding the Planet**, (Harvard University Press : Cambridge, Massachusetts, and London, England, 1991) p.xiii.

3. Lynton K. Caldwell, "Beyond Environmental Diplomacy : The Changing Institutional Structure of International Cooperation" in John E. Caroll ed., **International Environmental Diplomacy** (Cambridge University Press: Massachusetts, 1991), p.14.

treaties with hosts of multiple linked issue areas, had a cumbersome and difficult process to negotiate and enforce. As a result, the ozone legal response adopted an attractive alternative, i.e. the "soft law" option. The soft law option emerges as an offshoot from the very structure of ineffective modern environmental treaties. It represents a change from treaties which tend to be integrated with multiple issue linkages, proving to be an exercise in futility because of lack of will by parties to join the regime. Comprising of range and flexibility, it is an important step in the process of building norms, since it creates the perfect setting for the creation of a "hard law". Despite some of its jurisprudential difficulties, the Ozone Regime has contributed towards environmental lawmaking. Incorporating the "precautionary principle" in the pre-negotiating stage, the Ozone Regime highlights that pre-emptive action with a backdrop of scientific uncertainty is the ideal solution for an anticipated disater that may be irreversible. It may now be regarded to be emerging as a general principle of international environmental law. Another emerging concept of international (and domestic) lawmaking is "sustainable development" which is also based on foresight and anticipation. The term, though lacking a precise definition and content is considered as:

> Sustainable development is development that meets

the needs for the present without compromising the ability of future generations to meet their own needs.[4]

The "framework convention-protocol approach", as used in the ozone response establishes an environment that is conducive to a certain amount of flexibility and manouverability and, through an in-built lawmaking mechanism, provides scope for future reforms and actions with subsequent additions of detailed protocols to the skelatal framework convention. Furthermore, the Ozone Regime demonstrates that for the first time, richer countries acknowledge the glaring need to arrive at equitable solutions to help the developing countries to accept and undertake the law. The ozone respone attempts to deal with various economic and structural discrepencies among the developed and developing nations.

In fact, for the first time, the ozone model even creates a financial mechanism, the Multilateral Fund, for the purpose of financial and technical cooperation to developing countries. It has an extensive incentive and disincentive structure laid out for parties and non-parties

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4. World Commission on Environment and Development (WCED), **Our Common Future** (Oxford University Press : New York, 1987), p.43.

respectively. It even provides market incentves to stimulate technological innovations. The factor of public opinion pressures, role of leadership and the private sector standpoint have also proved to be important.

In the post negotiation stage, facilitating treaty implementation is a fundamental concern. The crucial problem is the requirement of effective machinery to enforce the drawn out legal responses. For this purpose, a wide ratification of the instrument and a strong institutional structive to monitior implementation is required. There must be an effective redressal system, coercive system and an incentive system. Finally, a compulsory dispute settlement mechanism will add to the instrumet's reliablity and effectiveness. Enforcement is the most important part of any legal commitment or agreement. An effective enforcement mechanism dictates the rationale for which a convention or agreement stands and is as complex as it is important.

What we need today is an adequate, workable and effective international legal framework which can address the various environmental issues that confront us. The ozone regime renders many such lessons for future international environmental lawmaking.

APPENDIX

I. Status of ratification of the 1985 Vienna Convention for the Protection of the Ozone Layer a/

	Signature	Ratification	Entry into force
Algeria		20.10.1992(Ac)	18.1.1993
Antigua and Barbuda		3.12.1992(Ac)	3.3.1993
Argentina 5/	22.3.1985	18.1.1990(R)	18.4.1990
Australia		16.9.1987(Ac)	22.9.1988
Austria	16.9.1985	19.8.1987(R)	22.9.1988
Bahamas		1.4.1993(Ac)	30.6.1993
Bahrain 7/		27.4.1990(Ac)	26.7.1990
Bangladesh		2.8.1990(Ac)	31.10.1990
Barbados		16.10.1992(Ac)	14.1.1993
Belarus	22.3.1985	20.6.1986(At)	22.9.1988
Belgium	22.3.1985	17.10.1988(R)	15.1.1989
Benin		1.7.1993(Ac)	29.9.1993
Bosnia and Herzegovina		6.3.1992(Sc)	6.3.1992
Botswana		4.12.1991(Ac)	2.3.1992
Brazil		19.3.1990(Ac)	17.6.1990
Brunei Darussalam		26.7.1990(Ac)	24.10.1990
Bulgaria		20.11.1990(Ac)	18.2.1991
Burkina Faso	12.12.1985	30.3.1989(R)	28.6.1989
Cameroon		30.8.1989(Ac)	28.11.1989
Canada	22.3.1985	4.6.1986(R)	22.9.1988
Central African Republic		29.3.1993(Ac)	27.6.1993

	Signature	Ratification	Entry into force
Chad		18.5.1989(Ac)	16.8.1989
Chile [a]	26.3.1985	6.3.1990(R)	24.6.1990
China		11.9.1989(Ac)	10.12.1989
Colombia		16.7.1990(Ac)	14.10.1990
Costa Rica		30.7.1991(Ac)	28.10.1991
Cote d'Ivoire		5.4.1993(Ac)	4.7.1993
Croatia		8.10.1991(Sc)	8.10.1991
Cuba		14.7.1992(Ac)	12.10.1992
Cyprus		28.5.1992(Ac)	26.8.1992
Czech Republic		1.1.1993(Sc)	1.1.1993
Denmark	22.3.1985	29.9.1988(R)	28.12.1988
Dominica		31.3.1993(Ac)	29. 6.1993
Dominican Republic		18.5.1993(Ac)	16.8.1993
Ecuador		10.4.1990(Ac)	29.7.1990
Egypt	22.3.1985	9.5.1988(R)	22.9.1988
El Salvador		2.10.1992(Ac)	31.12.1992
Equatorial Guinea		17.8.1988(Ac)	15.11.1988
Fiji		23.10.1989(Ac)	21.1.1990
Finland	22.3.1985	26.9.1986(R)	22.9.1988
France	22.3.1985	4.12.1987(Ap)	22.9.1988
Gabon		9.2.1994(Ac)	10.5.1994
Gambia		25.7.1990(Ac)	23.10.1990

	Signature	Ratification	Entry into force
Germany [1/10/]	22.3.1985	30.9.1988(R)	29.12.1988
Ghana		24. 7.1989(R)	22.10.1989
Greece	22.3.1985	29.12.1988(R)	29.3.1989
Grenada		31.3.1993(Ac)	29.6.1993
Guatemala		11.9.1987(Ac)	22.9.1988
Guinea		25.6.1992(Ac)	23.9.1992
Guyana		12.8.1993(Ac)	10.11.1993
Honduras		14.10.1993(Ac)	12.1.1994
Hungary		4.5.1988(Ac)	22.9.1988
Iceland		29.8.1989(Ac)	27.11.1989
India		18.3.1991(Ac)	16.6.1991
Indonesia		26.6.1992(Ac)	24.9.1992
Iran, Islamic Republic of		3.10.1990(Ac)	1.1.1991
Ireland		15.9.1988(Ac)	14.12.1988
Israel		30.6.1992(Ac)	28.9.1992
Italy	22.3.1985	19.9.1988(R)	18.12.1988
Jamaica		31.3.1993(Ac)	29.6.1993
Japan		30.9.1988(Ac)	29.12.1988
Jordan		31.5.1989(Ac)	30.8.1989
Kenya		9.11.1988(Ac)	7.2.1989
Kiribati		7.1.1993(Ac)	7.4.1993

	Signature	Ratification	Entry into force
Korea, Republic of		27.2.1992(Ac)	27.5.1992
Kuwait		23.11.1992(Ac)	21.2.1993
Lebanon		30.3.1993(Ac)	28.6.1993
Libyan Arab Jamahiriya		11.7.1990(Ac)	9.10.1990
Liechtenstein		8.2.1989(Ac)	9.5.1989
Luxembourg	17.4.1985	17.10.1988(R)	15.1.1989
Malawi		9.1.1991(Ac)	9.4.1991
Malaysia		29.8.1989(Ac)	27.11.1989
Maldives		26.4.1988(Ac)	22.9.1988
Malta		15.9.1988(Ac)	14.12.1988
Marshall Islands		11.3.1993(Ac)	9.6.1993
Mauritania		26.5.1994(Ac)	24.8.1994
Mauritius [12/]		18.8.1992(Ac)	16.11.1992
Mexico	1.4.1985	14.9.1987(R)	22.9.1988
Monaco		12.3.1993(Ac)	10.6.1993
Morocco	7.2.1986		
Myanmar		24.11.1993(Ac)	22.2.1994
Namibia		20.9.1993(Ac)	19.12.1993
Netherlands [2/]	22.3.1985	19.9.1988(Ac)	18.12.1988
New Zealand [3/]	21.3.1986	2.6.1987(R)	22.9.1988
Nicaragua		5.3.1993(Ac)	3.6.1993
Niger		9.10.1992(Ac)	7.1.1993
Nigeria		31.10.1988(Ac)	29.1.1989

	Signature	Ratification	Entry into force
Norway	22.3.1985	23.9.1986(R)	22.9.1988
Pakistan		18.12.1992(Ac)	18.3.1993
Panama		13.2.1989(Ac)	14.5.1989
Papua New Guinea		27.10.1992(Ac)	25.1.1993
Paraguay		3.12.1992(Ac)	3.3.1993
Peru	22.3.1985	7.4.1989(R)	6.7.1989
Philippines		17.7.1991(Ac)	15.10.1991
Poland		13.7.1990(Ac)	11.10.1990
Portugal [14/]		17.10.1988(Ac)	15.1.1989
Romania		27.1.1993(Ac)	27.4.1993
Russian Federation [11/]	22.3.1985	18.6.1986(At)	22.9.1988
Saint Kitts and Nevis		10.8.1992(Ac)	8.11.1992
Saint Lucia		28.7.1993(Ac)	26.10.1993
Samoa		21.12.1992(Ac)	21.3.1993
Saudi Arabia		1. 3.1993(Ac)	30.5.1993
Senegal		19.3.1993(Ac)	17.6.1993
Seychelles		6.1.1993(Ac)	6.4.1993
Singapore		5. 1.1989(Ac)	5.4.1989
Slovakia		28. 5.1993(Sc)	28.5.1993
Slovenia		6.7.1992(Sc)	6.7.1992
Solomon Islands		17. 6.1993(Ac)	15.9.1993
South Africa		15. 1.1990(Ac)	15.4.1990

II. Status of ratification of the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer [a]

	Signature	Ratification	Entry into Force
Algeria		20.10.1992(Ac)	18.1.1993
Antigua and Barbuda		3.12.1992(Ac)	3.3.1993
Argentina [11]	29.6.1988	18.9.1990(R)	16.12.1990
Australia	8.6.1988	19.5.1989(R)	17.8.1989
Austria	29.8.1988	3.5.1989(R)	1.8.1989
Bahamas		4.5.1993(Ac)	2.8.1993
Bahrain [7]		27.4.1990(Ac)	26.7.1990
Bangladesh		2.8.1990(Ac)	31.10.1990
Barbados		16.10.1992(Ac)	14.1.1993
Belarus	22.1.1988	31.10.1988(At)	1.1.1989
Belgium	16.9.1987	30.12.1988(R)	30.3.1989
Benin		1.7.1993(Ac)	29.9.1993
Bosnia and Herzegovina		6.3.1992(Sc)	6.3.1992
Botswana		4.12.1991(Ac)	2.3.1992
Brazil		19.3.1990(Ac)	17.6.1990
Brunei Darussalam		27.5.1993(Ac)	25.8.1993
Bulgaria		20.11.1990(Ac)	18.2.1991
Burkina Faso	14.9.1988	20.7.1989(R)	18.10.1989
Cameroon		30.8.1989(Ac)	28.11.1989
Canada	16.9.1987	30.6.1988(R)	1.1.1989
Central African Republic		29.3.1993(Ac)	27.6.1993

	Signature	Ratification	Entry into Force
Chile [6]	14.6.1988	26.3.1990(R)	24.6.1990
China		14.6.1991(Ac)	12.9.1991
Colombia		6.12.1993(Ac)	6.3.1994
Congo	15.9.1988		
Costa Rica		30.7.1991(Ac)	28.10.1991
Cote d'Ivoire		5.4.1993(Ac)	4.7.1993
Croatia		8.10.1991(Sc)	8.10.1991
Cuba		14.7.1992(Ac)	12.10.1992
Cyprus		28.5.1992(Ac)	26.8.1992
Czech Republic		1.1.1993(Sc)	1.1.1993
Denmark [1]	16.9.1987	16.12.1988(R)	1.1.1989
Dominica		31.3. 1993(Ac)	29.6.1993
Ecuador		30.4.1990(Ac)	29.7.1990
Egypt	16.9.1987	2.8.1988(R)	1.1.1989
El Salvador		2.10.1992(Ac)	31.12.1992
Fiji		23.10.1988(Ac)	21.1.1990
Finland	16.9.1987	23.12.1988(R)	1.1.1989
France	16.9.1987	28.12.1988(Ap)	1.1.1989
Gabon		9.2.1994(Ac)	10.5.1994
Gambia		25.7.1990(Ac)	23.10.1990
Germany [2/12/]	16.9.1987	16.12.1988(R)	1.1.1989
Ghana	16.9.1987	24.7.1989(R)	22.10.1989

	Signature	Ratification	Entry into Force
Greece	29.10.1987	29.12.1988(R)	29.3.1989
Grenada		31.3.1993(Ac)	29.6.1993
Guatemala		7.11.1989(Ac)	5.2.1990
Guinea		25.6.1992(Ac)	23.9.1992
Guyana		12.8.1993(Ac)	10.11.1993
Honduras		14.10.1993(Ac)	12.1.1994
Hungary		20.4.1989(Ac)	19.7.1989
Iceland		29.8.1989(Ac)	27.11.1989
India		19.6.1992(Ac)	17.9.1992
Indonesia	21.7.1988	26.6.1992(Ac)	24.9.1992
Iran, Islamic Republic of		3.10.1990(Ac)	1.1.1991
Ireland	15.9.1988	16.12.1988(R)	1.1.1989
Israel a/	14.1.1988	30.6.1992(R)	28.9.1992
Italy	16.9.1987	16.12.1988(R)	1.1.1989
Jamaica		31.3.1993(Ac)	29.6.1993
Japan	16.9.1987	30.9.1988(At)	1.1.1989
Jordan		31.5.1989(Ac)	30.8.1989
Kenya	16.9.1987	9.11.1988(R)	7.2.1989
Kiribati		7.1.1993(Ac)	7.4.1993
Korea, Republic of		27.2.1992(Ac)	27.5.1992
Kuwait		23.11.1992(Ac)	21.2.1993
Lebanon		31.3.1993(Ac)	29.6.1993

	Signature	Ratification	Entry into Force
Libyan Arab Jamahiriya		11.7.1990(Ac)	9.10.1990
Liechtenstein		8.2.1989(Ac)	8.5.1989
Luxembourg	29.1.1988	17.10.1988(R)	15.1.1989
Malawi		9.1.1991 (Ac)	9.4.1991
Malaysia		29.8.1989(Ac)	27.11.1989
Maldives	12.7.1988	16.5.1989(R)	14.8.1989
Malta	15.9.1988	29.12.1988(R)	1.1.1989
Marshall Islands		11.3.1993(Ac)	9.6.1993
Mauritania		26.5.1994(Ac)	24.8.1994
Mauritius [14/]		18.8.1992(Ac)	16.11.1992
Mexico	16.9.1987	31.3.1988(Ac)	1.1.1989
Monaco		12.3.1993(Ac)	10.6.1993
Morocco	7.1.1988		
Myanmar		24.11.1993(Ac)	22.2.1994
Namibia		20.9.1993(Ac)	19.12.1993
Netherlands [3/]	16.9.1987	16.12.1988(At)	1.1.1989
New Zealand [4/]	16.9.1987	21.7.1988(R)	1.1.1989
Nicaragua		5.3.1993(Ac)	3.6.1993
Niger		9.10.1992(Ac)	7.1.1993
Nigeria		31.10.1988(Ac)	29.1.1989
Norway	16.9.1987	24.6.1988(R)	1.1.1989
Pakistan		18.12.1992(Ac)	18.3.1993
Panama	16.9.1987	3.3.1989(R)	1.6.1989

	Signature	Ratification	Entry into Force
Papua New Guinea		27.10.1992(Ac)	25.1.1993
Paraguay		3.12.1992(Ac)	3.3.1993
Peru		31.3.1993(Ac)	29.6.1993
Philippines	14.9.1988	17.7.1991(R)	15.10.1991
Poland		13.7.1990(Ac)	11.10.1990
Portugal [16]	16.9.1987	17.10.1988(R)	15.1.1989
Romania		27.1.1993(Ac)	27.4.1993
Russian Federation [13]	29.12.1987	10.11.1988(At)	1.1.1989
Saint Kitts and Nevis		10.8.1992(Ac)	8.11.1992
Saint Lucia		28.7.1993(Ac)	26.10.1993
Samoa		21.12.1992(Ac)	21.3.1993
Saudi Arabia		1.3.1993(Ac)	30.5.1993
Senegal	16.9.1987	6.5.1993(R)	4.8.1993
Seychelles		6.1.1993(Ac)	6.4.1993
Singapore		5.1.1989(Ac)	5.4.1989
Slovakia		28.5.1993(Sc)	28.5.1993
Slovenia		6.7.1992(Sc)	6.7.1992
Solomon Islands		17.6.1993(Ac)	15.9.1993
South Africa		15.1.1990(Ac)	15.4.1990
Spain	21.7.1988	16.12.1988(R)	1.1.1989
Sri Lanka		15.12.1989(Ac)	15.3.1990
Sudan		29.1.1993(Ac)	29.4.1993

	Signature	Ratification	Entry into Force
Swaziland		10.11.1992(Ac)	8.2.1993
Sweden	16.9.1987	29.6.1988(R)	1.1.1989
Switzerland	16.9.1987	28.12.1988(R)	1.1.1989
Syrian Arab Republic		12.12.1989(Ac)	12.3.1990
Tanzania, United Republic of		16.4.1993(Ac)	15.7.1993
Thailand	15.9.1988	7.7.1989(R)	5.10.1989
The former Yugoslav Republic of Macedonia		10.3.1994(Sc)	10.3.1994
Togo	16.9.1987	25.2.1991(R)	25.5.1991
Trinidad and Tobago		28.8.1989(Ac)	26.11.1989
Tunisia		25.9.1989(Ac)	24.12.1989
Turkey		20.9.1991(Ac)	19.12.1991
Turkmenistan		18.11.1993(Ac)	16.2.1994
Tuvalu		15.7.1993(Ac)	13.10.1993
Uganda	15.9.1988	15.9.1988(R)	1.1.1989
Ukraine	18.2.1988	20.9.1988(At)	1.1.1989
United Arab Emirates		22.12.1989(Ac)	22.3.1990
United Kingdom 5/9/10/15	16.9.1987	16.12.1988(R)	1.1.1989
U.S.A.	16.9.1987	21.4.1988(R)	1.1.1989
Uruguay		8.1.1991(Ac)	8.4.1991
Uzbekistan		18.5.1993(Ac)	16.8.1993
Venezuela	16.9.1987	6.2.1989(R)	7.5.1989
Viet Nam		26.1.1994(Ac)	26.4.1994

	Signature	Ratification	Entry into Force
Yugoslavia		3.1.1991(Ac)	3.4.1991
Zambia		24.1.1990(Ac)	24.4.1990
Zimbabwe		3.11.1992(Ac)	1.2.1993
EEC	16.9.1987	16.12.1988(Ap)	16.3.1989
TOTAL	46	134	

R = Ratification
Ac = Accession
Ap = Approval
At = Acceptance
Sc = Succession

III. Status of ratification of the London Amendment to the Montreal Protocol [c]

	Ratification	Entry into Force
Algeria	20.10.1992(Ac)	18.1.1993
Antigua and Barbuda	23.2.1993(Ac)	24.5.1993
Argentina	4.12.1992(R)	4.3.1993
Australia	11.8.1992(Ap)	9.11.1992
Austria	11.12.1992(R)	11.3.1993
Bahamas	4.5.1993(Ac)	2.8.1993
Bahrain [d]	23.12.1992(Ac)	23.3.1993
Bangladesh	18.3.1994(R)	16.6.1994
Belgium	5.10.1993(R)	3.1.1994
Brazil	1.10.1992(At)	30.12.1992
Cameroon	8.6.1992(Ac)	6.9.1992
Canada	5.7.1990(Ac)	10.8.1992
Chile	9.4.1992(Ac)	10.8.1992
China	14.6.1991(Ac)	10.8.1992
Colombia	6.12.1993(Ap)	6.3.1994
Cote d'Ivoire	18.5.1994(R)	16.8.1994
Croatia	15.10.1993(R)	13.1.1994
Denmark [a]	20.12.1991(Ac)	10.8.1992
Dominica	31.3.1993(Ac)	29.6.1993
Ecuador	23.2.1993(R)	24.5.1993
Egypt	13.1.1993(R)	13.4.1993

	Signature	Ratification	Entry into force
Finland		20.12.1991(Ac)	10.8.1992
France		12.2.1992(Ap)	10.8.1992
Germany		27.12.1991(R)	10.8.1992
Ghana		24.7.1992(R)	22.10.1992
Greece		11.5.1993(R	9.8.1993
Grenada		7.12.1993(Ac)	7.3.1994
Guinea		25.6.1992(Ac)	23.9.1992
Hungary		9.11.1993(Ap)	7.2.1994
Iceland		16.6.1993(Ac)	14.9.1993
India		19.6.1992(Ac)	17.9.1992
Indonesia		26.6.1992(R)	24.9.1992
Ireland		20.12.1991(Ac)	10.8.1992
Israel		30.6.1992(R)	28.9.1992
Italy		21.2.1992(Ap)	10.8.1992
Jamaica		31.3.1993(Ac)	29.6.1993
Japan		4.9.1991(Ac)	10.8.1992
Jordan		12.11.1993(R)	10.2.1994
Korea, Republic of		10.12.1992(Ac)	10.3.1993
Lebanon		31.3.1993(Ac)	29.6.1993
Liechtenstein		24.3.1994(R)	22.6.1994
Luxembourg		20.5.1992(R)	18.8.1992
Malawi		8.2.1994(Ap)	9.5.1994

	Signature	Ratification	Entry into force
Malaysia		16.6.1993(Ac)	14.9.1993
Maldives		31.7.1991(R)	10.8.1992
Malta		4.2.1994 (Ap)	5.5.1994
Marshall Islands		11.3.1993(Ac)	9.6.1993
Mauritius		20.10.1992(Ac)	18.1.1993
Mexico		11.10.1991(At)	10.8.1992
Monaco		12.3.1993(Ac)	10.6.1993
Myanmar		24.11.1993(Ap)	22.2.1994
Netherlands [//]		20.12.1991(Ac)	10.8.1992
New Zealand		1.10.1990(Ac)	10.8.1992
Norway		18.11.1991(R)	10.8.1992
Pakistan		18.12.1992(Ac)	18.3.1993
Panama		10.2.1994(R)	11.5.1994
Papua New Guinea		4.5.1993(Ac)	2.8.1993
Paraguay		3.12.1992(Ac)	3.3.1993
Peru		31.3.1993(Ac)	29.6.1993
Philippines		9.8.1993(R)	7.11.1993
Portugal [6]		24.11.1992(R)	22.2.1993
Romania		27.1.1993(Ac)	27.4.1993
Russian Federation		13.1.1992(Ac)	10.8.1992
Saudi Arabia		1.3.1993(Ac)	30.5.1993
Senegal		6.5.1993(R)	4.8.1993

	Ratification	Entry into Force
Seychelles	6.1.1993(Ac)	6.4.1993
Singapore	2.3.1993(Ac)	31.5.1993
Slovak Republic	15.4.1994(Ap)	14.7.1994
Slovenia	8.12.1992(At)	8.3.1993
South Africa	12.5.1992(Ac)	10.8.1992
Spain	19.5.1992(Ac)	17.8.1992
Sri Lanka	16.6.1993(Ac)	14.9.1993
Sweden	2.8.1991(R)	10.8.1992
Switzerland	16.9.1992(R)	14.12.1992
Tanzania, United Republic of	16.4.1993(Ac)	15.7.1993
Thailand	25.6.1992(R)	23.9.1992
Tunisia	15.7.1993(Ac)	13.10.1993
Turkmenistan	15.3.1994(Ac)	13.6.1994
Uganda	20.1.1994(R)	20.4.1994
United Kingdom[3/5/]	20.12.1991(R)	10.8.1992
Uruguay	16.11.1993(R)	14.2.1994
U.S.A.	18.12.1991(R)	10.8.1992
Venezuela	29.7.1993(R)	27.10.1993
Viet Nam	26.1.1994(Ac)	26.4.1994
Zambia	15.4.1994(R)	14.7.1994
EEC	20.12.1991(Ap)	10.8.1992
Total	86	

IV. Status of ratification of the Copenhagen Amendment to the Montreal Protocol [4/]

	Ratification	Entry into force
Antigua and Barbuda	19.7.1993(Ac)	14.6.1994
Bahamas	4.5.1993(Ac)	14.6.1994
Canada	16.3.1994(R)	14.6.1994
Chile	14.1.1994(R)	14.6.1994
Denmark [2/]	21.12.1993(Ap)	14.6.1994
Ecuador	24.11.1993(Ap)	14.6.1994
Finland	16.11.1993(Ac)	14.6.1994
Germany	28.12.1993(R)	14.6.1994
Hungary	17.5.1994(Ac)	15.8.1994
Iceland	15.3.1994(R)	14.6.1994
Luxembourg	9.5.1994(R)	7.8.1994
Malawi	28.2.1994(Ac)	14.6.1994
Malaysia	5.8.1993(Ac)	14.6.1994
Marshall Islands	24.5.1993(Ac)	14.6.1994
Mauritius	30.11.1993(R)	14.6.1994
Netherlands	25.4.1994(Ac)	24.7.1994
New Zealand [1/]	4.6.1993(R)	14.6.1994
Norway	3.9.1993(At)	14.6.1994
Saint Kitts and Nevis	19.5.1994(Ac)	17.8.1994
Saudi Arabia	1.3.1993(Ac)	14.6.1994
Seychelles	27.5.1993(Ac)	14.6.1994

	Ratification	Entry into force
Sweden	9.8.1993(R)	14.6.1994
U.S.A.	2.3.1994(R)	14.6.1994
Viet Nam	26.1.1994(Ac)	14.6.1994
Total	24	

List of Parties categorized as operating under Article 5 paragraph 1 of the Montreal Protocol

1. Argentina
2. Bahamas
3. Bahrain
4. Bangladesh
5. Brazil
6. Brunei Darussalam
7. Burkina Faso
8. Cameroon
9. Chile
10. China
11. Colombia
12. Cote d'Ivoire
13. Croatia
14. Cuba
15. Ecuador
16. Egypt
17. Fiji
18. Ghana
19. Guyana
20. Guatemala
21. Indonesia
22. Jamaica
23. Jordan
24. Kenya
25. Malawi
26. Malaysia
27. Maldives
28. Malta
29. Mexico
30. Myanmar
31. Nigeria
32. Panama
33. Peru

34. Philippines
35. Republic of Korea
36. Romania
37. Saudi Arabia
38. Senegal
39. Seychelles
40. Solomon Islands
41. Sri Lanka
42. Sudan
43. Swaziland
44. Thailand
45. Togo
46. Tunisia
47. Turkey
48. Uganda
49. Uruguay
50. Venezuela
51. Viet Nam
52. Yugoslavia
53. Zimbabwe

List of Parties temporarily categorized as operating under Article 5 paragraph 1 of the Montreal Protocol*

1. Antigua and Barbuda
2. Algeria
3. Barbados
4. Benin
5. Bosnia and Herzegovina
6. Botswana
7. Central African Republic
8. Costa Rica
9. Dominica
10. El Salvador
11. Gabon
12. Gambia
13. Grenada
14. Guinea
15. Honduras
16. India
17. Iran, Islamic Republic of
18. Kiribati
19. Lebanon
20. Libyan Arab Jamahiriya
21. Mauritius
22. Namibia
23. Nicaragua
24. Niger
25. Pakistan
26. Papua New Guinea
27. Paraguay
28. Saint Kitts and Nevis
29. Saint Lucia

30. Samoa

31. Syrian Arab Republic

32. Tanzania, United Republic of

33. The former Yugoslav Republic of Macedonia

34. Trinidad and Tobago

35. Zambia

*Categorization is temporary pending receipt of complete split data.

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