

**ENVIRONMENTAL PROTECTION PRESSURE GROUPS IN  
KERALA: A STUDY ON THEIR STRUCTURE, STRATEGY  
AND ROLE WITH SPECIAL REFERENCE TO INDUSTRIAL  
POLLUTION**

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Faculty of Social Sciences

*by*

**PEREIRA GLADYS MYRTLE**

*Under the supervision of*

**Prof. P. RAMACHANDRA PODUVAL**

**SCHOOL OF MANAGEMENT STUDIES  
UNIVERSITY OF COCHIN  
COCHIN - 682 022**



**SCHOOL OF MANAGEMENT STUDIES  
UNIVERSITY OF COCHIN  
RAMACHANDRA PODUVAL  
PROFESSOR.**

COCHIN-682 022  
KERALA, INDIA  
PHONE: 85-5310

No. SMS.

Date October 7, 1985

**CERTIFICATE**

**Certified that the thesis "Environmental Protection Pressure Groups in Kerala: A Study on Their Structure, Strategy and Role with Special Reference to Industrial Pollution", is the record of bonafide research carried out by Miss. Pereira Gladys Myrtle under my supervision and guidance. The thesis is worth submitting for the degree of Doctor of Philosophy under the Faculty of Social Sciences.**

**(P.RAMACHANDRA PODUVAL)**

## DECLARATION

I, Pereira Gladys Myrtle, hereby declare that the thesis submitted by me for the award of the degree of Doctor of Philosophy in Social Sciences is the original work done by me under the supervision of Prof. P. Ramachandra Peduval, School of Management Studies, University of Cochin. I also declare that this thesis has not previously formed the basis of the award of any degree, diploma, associate-ship or other similar title.

Cochin-682 022

7th October, 1985




(PEREIRA GLADYS MYRTLE)

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## C H A P T E R - I

### 1.0.0 INTRODUCTION, SCOPE, METHODOLOGY AND LIMITATIONS OF THE STUDY

#### INTRODUCTION

#### 1.1.0 Pressure Groups in Pluralistic Societies

1.1.1           The study of pressure groups occupies an important place in the modern political system. Pressure groups are more active in pluralistic societies with a democratic form of government. Social scientists view a pluralistic society as a society which operates between monolithic and anarchic patterns of organization (Davis Keith and Robert Blomstrom, 1971, p.26)\*. In the monolithic society power is centralized and one social institution forms the vehicle through which the needs of men are satisfied. On the other hand, two contradictory values can be observed with

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\*Davis, Keith and Robert Blomstrom, Business, Society and Environment: Social Power and Social Response, McGraw Hill Book Co., New York, 1971.

A note on the method of giving references in this work The method of giving references in this work is different from the traditional method of giving continuous number index at the appropriate place and giving the details at the bottom of the page. The researcher has adopted the method followed in the publications of behavioural sciences i.e. giving the name of the author(s) and the year of .....

reference to the concept "anarchism". Viewed in the negative sense it refers to "an unorganized society in which each person pursues his own interests without regard to others" (Davis Keith and Robert Blomstrom, 1975, pp.62-63). Rousseau has given a positive value to the concept "Anarchism". Richard T. La Pierre in his book 'Social Change' has quoted Rousseau who believed that "a state of social anarchy would be one of willing and blissful co-operation among individuals, that is, that once government was destroyed, the truly natural and perfected society would quickly come into being" (La Pierre, T. Richard, 1965, p.10). Pluralism which occupies a broad middle ground on a social continuum from monism at one extreme to anarchy at the other, is defined by John Gardner as "a society characterized by variety, alternatives, choices and multiple focuses of power and initiative" (Gardner N. John, 1969, p.40). A similar definition is given in Christopher Bryant's book "Sociology in Action", where a reference to Ralf Dahrendorf's view on the concept "pluralism" is quoted. According to

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publication in brackets immediately after the sentence. However, this system without a reference to the page number of the work quoted at the appropriate place immediately after the sentence will not serve the purpose and hence a modification is introduced by the researcher viz. giving reference about the actual page number (if it is not a reference to the complete book) along with the name of author(s) and year of publication. This modification eliminates the disadvantage of the system of reference adopted by books found in behavioural sciences.

References given in brackets in the text of the thesis have been consolidated and given from page 401 to 414 in alphabetical order of authors and also in chronological....

Dahrendorf "Pluralism of institutions, conflict patterns, groupings and interests makes for a lively, colourful and creative scene of political conflict which provides an opportunity for success for every interest that is voiced" (Bryant Christopher, 1976, p.273).

1.1.2 Sociologists like Herbert Spencer and Emile Durkheim have classified society into two types: According to Spencer, two opposite types of societies can be distinguished i.e. 'militant' and 'industrial'. "Militant societies are despotic, whereas industrial societies are more democratic being governed by elected representatives" (Cuff, E.C. and G.C.F. Payne, 1979, p.25). The 'Militant' society stressed by Spencer is identical with the monolithic, whereas the 'industrial' society is identical with the pluralistic form of society. Emile Durkheim in his book, 'The Division of Labour in Society', which he subtitled "The Study of the Organization of Advanced Societies" focusses on the problems

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order of the year of publication, when there are more than one publications of the same author.

This new method of reference does not have any disadvantage compared to the traditional one, except that the reader has to immediately refer page 401 to 414, for the citation. The advantage of the new system is that one can avoid repetitions and duplications of references often expressed by terms such as *ibid.*, *Op. cit.*, *etc.*

All future references in this work are in the new system of references explained above.

faced by societies as they change from simple to industrial societies. He suggests that each of these two types of societies are characterised by different forms of social solidarity. According to Durkheim, simple societies have little division of labour. They are made up of similar units such as tribes or families. Hence there is only a limited number of roles to be played by each group. They experience what Durkheim calls a 'mechanical solidarity', where men are bound together by common values based on shared and common experiences. As division of labour increases and new roles are acquired there is differentiation of units or groups and a new form of solidarity emerges which Durkheim calls "organic solidarity". It is characterised by the interdependence of different elements within a general acceptance of the need for differentiation (Durkheim Emile, 1960, pp.71-132).

Durkheim's mechanical solidarity of society is identical with the monolithic society and the organic solidarity of society is identical with the pluralistic form of society. Division of labour can be of two kinds: one refers to the specialisation of enterprises in the production of individual types of commodities and the other refers to individual occupational specialisation (Steiner George, 1975, p.41). Such kind of division of labour is characteristic in a pluralistic social system. Pluralism can be either social pluralism or political pluralism. In social pluralism, the emphasis is on

heterogeneity in the social system - heterogeneity in terms of class, caste, religion, language, occupation etc. Political pluralism within a system of government refers to diverse forces that influence policy and administrative decisions of authorities managing a territorial state. Political pluralism in a democratic form of government may even extend to institutions/organisations functioning within the state. This study on pressure groups for environmental protection is naturally on pluralism in a socio-political system at a given point of time in the Kerala scene.

### 1.1.3 Characteristics of a pluralistic social system:

Pluralistic society is characterised by diversity of interests. The existence of diverse groups such as social, economic, political, religious, regional, environmental etc. are developed by people to promote their interests and welfare. According to the 'Institutional School of Sociology', whose leading proponents are Seymour Lipset, Richard Bendix, Ralf Dahrendorf, Peter Blau, Barrington Moore, Maurice Eversger and D. Goldthorpe, the emergence of social institutions is not the conditions of the material life of society, but the emotions, ideas, customs and traditions (Geipov, G., 1969, pp.77-78). In a certain measure people arrive at the idea of establishing particular social institutions by becoming aware of particular requirements of material life. Different organisations have disparate goals, values, methods of operation, autonomy, power and interrelationships.

1.1.4            Another characteristic of pluralism is Institutional Specialization. Interests of people are wide and varied. In a pluralistic society people form different specialised institutions in order to satisfy different needs. According to W.G. Sumner, an institution consists of a concept and a structure. The structure holds the concept and furnishes instrumentalities for bringing it into the world of facts and action in a way to serve the interests of men in society (Sumner, W.G., 1906, pp.53-54). Lundberg refers to relatively formal, universal and unified behavioural patterns, which exist in social groups and are transmitted from generation to generation as institutions. These patterns, he says, arise from repeated group interactions as a response to the conditions of people. He maintains that "institutions consist of comparatively permanent habits, attitudes and material facilities which are organised into intricate and standardised systems and complexes" (Lundberg,<sup>G.A</sup><sub>A</sub> et.al., 1958, p.525).

1.1.5            In a pluralistic society the individuals are multiallephant. They claim loyalty to many institutions in order to fulfil different objectives. "Overlapping membership in many groups diversifies loyalties and minimises the danger that a strong leader in any one group can command the power of all members. The fact that people belong to many groups also increases their tolerance of other views"

(Steiner<sup>A</sup>, George, 1975, pp.79-80). On the other hand, while moving from the economic to the religious to the political and then to the recreational spheres, an individual is changing in the same alternating rhythm from one group to another. Each of these obliges him to fill only one functionally specific role, and each unites him with a differently constituted body of associates. In each group he plays at given intervals, so to speak, a guest role; he belongs with body and soul to none. In short his collective existence does not take place within a firm and stable framework, but consists of a chain of situationally determined events and occurrences (Geiger Theodor, 1969, p.183).

1.1.6 Pluralistic society is a relatively open system because there is regular relationship and interaction among different organizations. Some of the modes of interaction are co-operation, accommodation, conflict, competition and bargaining. F. Merrill holds that social interaction is "a continuous and reciprocal series of contacts between two or more socialised human beings" (Merrill, F., 1962, p.21). On the other hand Green writes about "the mutual influences that individuals and groups have upon one another as they attempt to solve individual or collective problems and as they strive to reach individual or group goals" (Green, A.W., 1952, p.49). To disclose the nature and relations of social interaction, the American Sociologist J. Ruesch writes that "social interaction consists of expressive actions on the

part of one or several persons, realised or unrealised perception of these expressive actions by other persons, and the reciprocal observation that such expressive actions are realised by others" (Osipov, G., 1969, p.69).

1.1.7 Another characteristic of pluralistic society is the dispersion of power among many groups, so that no one group dominates (Mockler Robert, 1975, p.41). Christopher Bryant, in his book 'Sociology in Action', has made a reference to Dahrendorf who believed that western society was largely pluralistic, i.e. the dominators in one association are not equal with those in other associations. Some men enjoy many dominating social positions and others none, but taken as a whole society reveals a rank order of individuals with those who always command at the top and <sup>those</sup> who always obey at the bottom and most somewhere in between (Bryant Christopher, 1976, p.272). Dahrendorf has not, however, done empirical work to establish the degree to which domination is concentrated or dispersed and he has been rightly criticised for this (Nichols, T., 1969, p.66). As a result of the dispersion of power conflicting interests are to be reconciled through accommodation, compromise and/or negotiation processes (Mockler Robert, 1975, p.41).



1.1.8 In spite of the multitude of groups and organizations there is co-operation among groups in order to gain rewards from organised multi-group efforts. The rewards expected in joint venture are not only economic, they may also be religious, regional, psychological, social and/or environmental. According to Linton a society is "any group of people who have lived and worked together long enough to get themselves organised and to think of themselves as a social unit with well defined limits" (Linton Ralph, 1936, p.91).

1.1.9 Political pluralism: Relevance of democratic form of government: The heterogeneous nature of organisations and groups in a pluralistic society permits its citizens to express their varying interests and desires. Democracy secures to all its citizens freedom of thought, expression, belief, faith and worship. The decentralisation of power in a pluralistic society is made possible through the democratic process, where people with common interests unite in a group through elections in order to influence the government. Rodee observes: "The elected official in turn can evaluate the desires of his constituents more effectively through the unofficial channel of interest group activity" (Rodee, et.al., 1967, p.464). The variety of institutions in a pluralistic society makes it possible for the members to satisfy diverse needs. This is evident in democracy, for its members have

the freedom of following different ways of making a living, living in different communities, holding different religious beliefs and having different social interests. A pluralistic society is an open system and the democratic framework within which it operates favours the different modes of interaction. There is competition and co-operation between the different power blocks. Democracy secures fraternity to all its citizens. In spite of the multitude of groups and organisations, there is co-operation among groups in order to gain additional rewards from organised group efforts. A non-democratic authoritarian government <sup>does</sup> not encourage political pluralism even in a society characterised by social pluralism. On the other hand countries having a democratic form of government encourage political pluralism even if the heterogeneity of the social system is at minimum. Pluralistic societies have always flourished in a democratic framework, for political pluralism encourages diversities in thoughts, expressions and actions of individuals, groups and organisations.

**1.1.10 Merits of pluralistic systems:** A pluralistic pattern of society with a congruent pluralistic political system provides opportunities for freedom and growth for individuals, groups and organisations. A society filled with a multitude of small groups and organisations and where the power is diffused has less chance for domination by any one institution. Hence there is freedom for the individual to seek loyalty to

one or a widely dispersed number of institutions or groups. Pluralism "protects the society against the threat that an individual group will come to wield total power" (Fadia Babulal, 1980, p.14).

1.1.11 Another advantage of pluralism is that there are many opportunities for leadership role. Many people can rise to the top of organizations in a pluralistic society, but in a monolithic society there are only a few opportunities for persons to secure top leadership roles.

1.1.12 The pluralistic society gives voice and expression to the individual. Different ideas and approaches to problems help to achieve common objectives. Thus workers in an organization have the right to express their interests legitimately through socially acceptable machinery like collective bargaining which is conducted through bonafide associations like trade unions.

1.1.13 "Pluralistic systems tend to be creative and innovative because their multiple areas of power and initiative provide alternative choices to society" (Davis Keith & Robert Blomstrom, 1975, p.70). Different people have, of course, different mental endowments. According to Osipov "differences can never mean that an individual creates something new from himself while another does not, but simply mean that some people see elements of the new in the surrounding world before others" (Osipov, G., 1969, p.172).

1.1.14 In a pluralistic society the needs of people are satisfied by different organisations and groups. Social interaction between different organisations and groups forms the channel through which different interests of its members are satisfied.

1.1.15 Weakness of pluralism: On the other hand, pluralism is not without faults and if carried to extremes, might result in social fragmentation. Due to different groups in a pluralistic society, objectives might overlap and one group might try to compete with the other in the process. The society does not favour every interest to be represented by a separate institution competing for power. Social fragmentation also affects the individual who finds his interests represented by many organisations that he feels close to none of them. According to Marx, he does not feel free "in any of his animal functions - eating, drinking, procreating, or at most in his dwelling and in dressing-up, etc. and in his human functions he no longer feels himself to be anything but an animal" (Marx Karl, 1961, p.73).

1.1.16 Diverse institutions tend to pursue their own interests unless there are superordinate goals to pull them together. Therefore, a pluralistic system tends to depend on the government to provide social goals, long range plans and policies to guide institutions towards achieving long term public objectives.

1.1.17 In a system in which institutions have some freedom of action there is always the possibility of institutional power being over-emphasised instead of institutional services (Davis Keith & Robert Elmstrom, 1975, p.71).

1.1.18 According to Keith Davis, due to the complex network of organisations and groups some people may "develop an elitist detachment from the persons they represent who just don't understand the system" (Davis Keith, 1975, p.73). "Western sociologists are apt to refer to the top of the social pyramid as the 'elite'. They believe that each social stratum has its own elite. All elites together form a governing and non-governing elite in society, which determines the entire course of history" (Osipov, G., 1969, p.148). In his book 'The Mind and Society' Pareto refers to the elite as follows: "So let us make a class of the people who have the highest indices in their branch of activity and to that class give the name 'elite' " (Pareto V., 1935, p.1423). Pareto proposes to distinguish a governing and a non-governing elite, and to divide all society into an upper stratum of the rulers and a lower stratum or 'non-elite' of the ruled. According to Engels "the historically determined class distinctions are thus reduced to natural differences which have to be recognised as part of the eternal law of nature and which must be respected with a bow to the noble and the wise by birth: in a word - a cult of the genius" (Osipov, G., 1969, p.150).

In addition to political elites, there are religious, scientific, intellectual and managerial elites. "It is such elites, it is argued, who are evolving out of earlier core-groups, such as aristocracies and ruling classes, as structural alternatives to ruling classes, representing a more specialised and advanced form of social leadership" (Cotgrove Stephen, 1978, p.156). Wright Mills terms the theories of equilibrium of elite and power distribution as 'romantic pluralism' (Osipov, G., 1969, p.154). In 'The Power Elite' he analyses the process of amalgamation of the big corporations, the politicians and the military elite in the United States. Wright Mills defines the power elite as "the political, economic and military echelons which through a network of inter-related cliques make joint decisions of at least nation-wide importance" (Osipov, G., 1969, p.154).

1.1.19 Another disadvantage of pluralism is the focus on conflict. Since there is a multitude of organisations and groups there is every chance of conflict arising among the different groups, where each group tries to achieve its own objectives. "Conflict, competition and co-operation are all interdependent. Any social system, in fact any concrete situation, will manifest all three in a complex and intertwined manner. There is no co-operating group, no matter how harmonious, which will not contain the seeds of suppressed conflict. There is no conflict, no matter how bitter, which

will not have some hidden basis of compromise" (Davis Kingsley, 1964, p.167). Dahrendorf, in his book 'Class and Class Conflict in Industrial Society', also examines the usefulness and applicability of Marx's sociological work to the study of modern industrial society. Dahrendorf concludes that "society can be characterised correctly in terms of conflict between competing interest groups". (Ralf Dahrendorf, 1959, p.81). According to Mockler the "process of conflict resolution tends to help maintain equilibrium in a democratic society" (Mockler Robert, 1975, p.41).

#### 1.2.0 Business in A Pluralistic Socio-political System

1.2.1 A business institution is not a passive agent which reflects all demands made upon it. Nor is it an active one that rejects all demands. It performs functions related to many different aspects of society, such as providing products and services needed or wanted by society, providing employment, contributing to the growth of the economy through the re-investments of profits and furthering selective social goals. Because of the variety of roles played by business, conflicts often arise. Maintaining a cleaner environment, eliminating high unemployment, having better health care and improving the quality of goods are some of the responsibilities that society is asking business to consider.

**1.2.2 Social responsibilities of business: Almost every author writing in this field has his or her own definition. The following are a few perspectives from which social responsibilities have been defined: theological (Baumhart Raymond, 1971; Theodore Purcell, 1967); sociological (Bell Daniel, 1971); aesthetics (Eells Richard, 1968); social problems (Rockefeller John, 1973); internalizing costs (Barkley and Seckler, 1972) and how future society judges today's performance (Farmer and Hogue, 1973). Social responsibility may also refer to an obligation, a liability, social consciousness, corporate legitimacy, charitable contributions, 'do goodism', managerial enlightenment and so on (Dow Votaw, 1972, pp.1-2;**

. However, social responsibility means something different depending upon how one looks at the concept and the role it plays in society. Today businessmen face a dilemma in determining how much social responsibility their companies should accept. This question is especially important to large corporations. For example, attempts by management to spend funds to improve the environment may be criticised by shareholders. On the other hand, management might try to maximise profits by refusing to pay the cost of devices to clean the air. This in turn, draws the wrath of local citizens, who object to the company's indifference to the community well-being. It is too easy to talk about the social role and responsibilities of business. "The difficult task is to make the day-to-day management decisions which translate social ideals



into reality within the restraints of business economics and a manager's personal goals" (Mockler Robert, 1975, p.3). Recently, social responsibility of business to environmental degradation is one of the dilemmas experienced by senior managers of industrial establishments. Environmental Impact Analysis and Social Cost Benefit Approach have been recommended to analyse such social problems for managerial decisions with a sense of social responsibility.

1.2.3 Environmental Impact Analysis: Is the assessment before any decision is taken of the future impact of the consequences of that decision for the quality of the total human environment on which man largely depends for his well-being" (Indian Manager, 1981, p.129). Theoretically speaking, the Environmental Impact Analysis would include all the possible impacts the project would pose in the given area, the residents of the locality, the forest, the water body, the air, the land, the raw materials, the fauna and flora, the historical monument, the employment potential and the social and cultural change. In practice only the important effects are considered as long as they can be estimated by the decision makers. The effects of a project may be divided into primary and secondary effects. Primary effects include direct impacts on man's health and welfare. Secondary effects include indirect environmental impacts, particularly on population concentration and growth (Jain, R.K., and G.S. Stacey, 1977, p.29). Identification of primary and secondary effects of projects would

require consultation with experts such as doctors, veterinary surgeons, geologists, zoologists, botanists, anthropologists, ecologists, hydrologists, sociologists and archaeologists. Such Environmental Impact Analysis enables the planner to evaluate the project from the initial stages of construction to the completion of the project and later on to the regular operation of the project. Such analysis would help to alter plans, minimise costs and maximise benefits.

1.2.4 Social Cost Benefit Analysis: Over the centuries economists like Adam Smith and others were quite conscious of the existence of social costs. It is possible to use the framework of cost-benefit analysis to reach conclusions about social costs. The benefits of a company could be determined by the value of the manufactured product to the individual who decides to purchase it. The costs include the usual manufacturing costs plus the social costs. Social costs include the capital that has been invested either publicly or privately for setting up the effluent treatment plant to combat pollution and compensation paid for pollution damages. Practically speaking, it is very difficult to measure the social costs of environmental damages caused by air, water, sound, land or radiation, but the most conventional way of measuring the social costs of environmental damages would be to establish, what the consumers are willing to pay to prevent it? This willingness to pay an extra social cost for the environmental product would depend on a number of factors like level of

income and necessity of the product. For example: An agriculturist requires fertilizers for crop improvement and better yields. If the cost of fertilisers inclusive of social costs exceeds the yield per year, naturally an agriculturist would discard paying an extra social cost since his income is much lower than expected. Thus "society must somehow weigh the benefits and the costs and decide whether or not the manufacturing process is desirable; if costs exceed benefits it is clearly undesirable, but even if benefits exceed costs there may be more beneficial alternatives" (Hodges Laurent, 1977, p.436).

1.2.5           Hence the social responsibility issues of business are wide and varied ranging from environmental pollution to discrimination of workers for employment. Since business exists in a society of many competing groups each of which seeks to advance its own interests, it is not surprising that the responsibilities a business organisation has to discharge might conflict with the interests of other groups such as environmentalists, minorities, suppliers, shareholders and/or consumers. Nature and characteristics of such pressure groups exercising influence on business firms have been a topic for discussion by many authors. They have tried to define pressure groups and have used it interchangeably with other concepts.

### 1.3.0 Nature and Characteristics of Pressure Groups

1.3.1 Definitions of pressure groups: In modern democratic states there are groups of persons organised on the basis of common vested interests. "They are neither political organisations, nor do they contest elections to achieve power; but endeavour to influence the course of public policies in order to achieve their objectives" (Fadia Babulal, 1980, p.7). Such groups are known as pressure groups.

1.3.2 According to the Encyclopaedia Britannica, a pressure group is defined as "any interest group that is not a part of the government and does not itself seek to govern the country in its own name, but does seek to influence that government for its own purposes" (The New Encyclopaedia Britannica, 1975, p.445).

1.3.3 Interest articulation is another term used to refer to pressure groups. "The process by which individuals and groups make demands upon the political decision-makers is called interest articulation" (Craig, R. Ducat, 1970, p.168). It is clear from this definition that pressure group activity is directed towards influencing changes in some particular dimension or set of dimensions of the prevailing social system.

1.3.4 Pressure groups are defined as "influence groups", organised to influence some policy of the government. According to Geoffrey Roberts, these groups "attempt to exert

influence over the government or parliament or local authorities but they do not themselves seek to act as the government" (Geoffrey Roberts, 1970, p.8). Verney observes that "the first criterion of a political interest group for our purpose is that it shall possess this influence" (Verney, D.V., 1959, p.132).

1.3.5 Key, V.O. (1964) and Padia Babulal (1980) refer to pressure groups as 'non-political groups'. Though pressure groups are "engaged in politics, their politics is that of policy" (Key, V.O., 1964, p.18). According to Padia, pressure groups "hide their political character by the logic of their being non-political entities" (Padia Babulal, 1980, p.9).

1.3.6 Craess, Kennedy and Odegard have referred to pressure groups as organised groups. "They are organised groups which attempt to influence Government decisions without seeking themselves to exercise the formal powers of Government" (Craess and Kennedy, 1970, p.60). Odegard makes a similar reference to pressure groups. "By pressure groups we mean any voluntarily organised group outside the Government structure which attempts to influence the nominations and appointments of government personnel, the adoption of public policy, its administration and adjudication" (Odegard, et.al., 1961, pp.149-150).

1.3.7 Parry Glyn used the concept 'interest pressure group'. When a group is concerned either wholly or partly with such pressure in order to influence those who determine public policy, such a group can be referred to as an 'interest pressure group' (Parry Glyn, 1969, p.379).

1.3.8 According to Fadia Babulal the concept 'pressure groups' and 'interest groups' are often used interchangeably and "there is no vital difference between the two" (Fadia Babulal, 1980, p.19). Teachers, housewives, students, farmers and businessmen have something in common within their respective categories which we call as 'interest'. Thus they may be regarded as 'interest groups'. At times interest groups might become pressure groups and vice-versa when the occasion arises. When an interest group acquires direct political significance it might change into a pressure group. Odegard has defined an interest group as "a formal organization of people who share one or more common aims or concerns and who are trying to influence the course of events, in particular the formation and administration of public policy by government so as to protect and promote their interests". (Odegard, et.al., 1961, pp.149-50). From all these definitions of pressure groups one can delineate several common elements which lead to an understanding of pressure groups.

- 1) They are non-political groups
- 2) They are not part of a Government

3) They influence the Government/Parliament/Local authorities to achieve their objectives.

1.3.9 Size of pressure groups: All pressure groups are not, for understandable reasons, of the same size. Some groups like entrepreneur group might be very small, their number being limited to a handful of individuals. On the other hand, the consumer group may be very large with thousands and even millions of individuals spread over a large region or country. The size of the group will depend on the objective to be achieved. Groups like those of employees, shareholders and entrepreneurs may work for the promotion of their group interests. Certain other groups like environmentalists, media and the government may work for the public good. Based on the objective to be achieved groups can be classified into three major categories (Yasasamy, N.J., 1982, p.21): primary, secondary and tertiary pressure groups. This classification is based on the degree of influence that groups external to an industrial organisation exert on the system. Primary pressure groups include employees, shareholders, entrepreneurs, suppliers and financial institutions. They are active groups and are interested in some sort of financial returns. Their pressures are usually directed towards the central core of any organisation namely the financial returns.

1.3.10 Secondary pressure groups would include the consumers, competitors and the neighbouring community. They

exert pressure in many different forms, but they are not active as the primary pressure groups. Consumers may demand better products. Competitors may influence the cost and quality of products manufactured. The neighbourhood community may exert pressure for the improvement of the surrounding area.

1.3.11 Tertiary pressure groups include international pressures, environmentalists, news media and in short the public at large. Organizations operating in different countries directly or indirectly are subject to international pressures. Environmental pressure group is a recent pressure group. They are basically interested in protecting the environment and the ecology. The tertiary pressure groups are more concerned with polity aspects like pollution control, social responsibility, contribution to national development and future growth plans.

1.3.12 Types of pressure groups: G.A. Almond and G.B. Powell have classified pressure groups into four types (Almond and Powell, 1966, pp.75-78):

1. Institutional pressure groups
2. Associational pressure groups
3. Non-associational pressure groups and
4. Anomic pressure groups



**1.3.13** Institutional pressure groups are found within such organisations as political parties, legislatures, armies, bureaucracies and churches. They are formal organisations, composed of professionally employed personnel with designated political and social functions to perform. But either as corporate bodies or as small groups within these bodies, these institutional pressure groups may articulate their own interests or represent the interests of other groups in the society (Almond, G.A., 1966, p.77).

**1.3.14** Associational pressure groups are the specialised structures for interest articulation. They include trade unions, associations of businessmen or industrialists, ethnic associations organised by religious denominations, civilian groups etc. These groups represent the interests of a particular group. They are characterised by full time professional staff and have rules and regulations for the formulation of interests and demands.

**1.3.15** Non-associational pressure groups include the kinship group, family, religious group, caste and regional groups. They are also known as 'traditional groups' (Hanson and Douglas, 1972, p.69).

**1.3.16** Anomic pressure groups are the characteristic feature of several developing countries and it is not a new phenomenon today. By anomic pressure group we mean more or

less a spontaneous group which breaks into the political system from the society, such as riots, demonstrations and assassinations. The use of violence and extra constitutional means by such group is known as anomic behaviour. Anomic pressure groups use a variety of tactics. Some of the tactics include public meetings, publicity, memoranda, press statements, mass rallies, torchlight procession, hartals, dharna, satyagraha, destruction of public property, fasting, gherao, etc.

1.3.17 Pressure group tactics: Pressure groups make use of different tactics to achieve their objectives. The most common method is lobbying. This is a technique commonly used by pressure groups operating in every political system. Lobbying is a political technique which means influencing the government (The New Encyclopaedia Britannica, 1975, p.175). The lobbyist acts as an intermediary between pressure groups and the government. Lobbying is the American contribution to political scene. These lobbies are known as fourth branch of the Government. According to Stewart, the object of lobbying is to persuade a member of the legislature of the degree of feelings in his constituency on an issue and incidentally to put some arguments to him (Stewart, J.D., 1958, p.207). Lobbying may take any form like personal meetings, delegations and deputations to the members of the legislative bodies, sending cables and telegrams, writing of letters and making telephone calls, staging demonstrations and organising strikes.

1.3.18           The media is a vital instrument used by pressure groups for spreading views, holding discussions and for making opinions effectively and quickly. The media has become such an important weapon that all interested groups, in order to get publicity, approach the media and they exercise more influence if they have got the media to support them.

1.3.19           Pressure groups create a favourable climate for their particular cause by appealing to public opinion through speeches, special articles, news releases, radio, books, pamphlets and newspapers. Another tactic used by pressure groups includes physical demonstrations and show of strength. These methods are especially employed by anomic pressure groups. The tactics of pressure groups vary from country to country and from one culture to another.

#### 1.4.0       Pressure Groups and Business Organizations: Consumerism

1.4.1           Pressure groups have not only influenced political parties and governments, but have also influenced business decisions from time to time. A business organisation cannot function detached from the social context in which it exists, nor can it be insensitive to the pressures affecting managerial decisions in many diverse ways. A business organisation is dependent for its survival on exchanges with the environment. The organisation receives inputs of money,

people and other resources, transforms these through its production processes and exports products and/or services. Hence an organisation is directly or indirectly influenced by diverse forces operating in its environment. Introduction of technology, size of the company, attitude towards consumers, unions and managerial decisions and actions in turn affect some groups in society. Since business has historically been seen as the real cause of many economic and social ills, it is not surprising that grassroot movements have arisen from time to time to discipline business and to initiate legislative remedies. Consumerism, environmental protection groups and social demands for equal employment opportunities are some of such major movements.

1.4.2 Consumerism: William T. Kelley views consumerism as an evolving set of activities of government, business, independent organisations and concerned consumers that are designed to protect the rights of consumers (Kelley T. William, 1973, p.4). On the other hand Carl McDaniel view consumerism as "a struggle for the balance of power between buyers and sellers" (McDaniel Carl, 1979, p.492). For decades the consumers had remained a neglected entity. They lacked a consistent champion of their cause and had no effective organization. They were exploited all along and had to buy the products at prices fixed by the businessmen, each linked in the commercial chain adding a certain commission and further raising the

prices. Since the consumers were a large group that was geographically distributed, it was impossible to get united without a suitable framework. Consumers' co-operatives were an earlier effort by consumers to solve their buying problems without outside help. In addition to the consumer co-operatives, several other organizations appeared, like the American Home Economics Association founded in 1908 by Mrs. Ellen H. Richards. The aim of the association was to bring together those interested in promoting better consuming habits. Many other factors favoured the growth of the consumer movement.

#### 1.4.3 Factors contributing to the rise of consumerism:

Consumerism as a movement has its origin and growth in United States of America. A review of the history of consumerism in United States of America may reveal the factors that favoured the growth of the consumer movement.

1.4.4 Many writers and educators provided necessary impetus to the consumer movement by their descriptions of the exploitation experienced by the hapless consumers. 'The Home Economists' was the first to become actively interested in consumer problems. The founder of this movement was Benjamin Thompson who made some of the earliest researches into cooking, heating and other matters of domestic concern during the last part of the 18th century. The first course in household arts appeared to be that offered by Mrs. Emma Willard in the Troy Female Seminary in 1821. Several books were published in

'Home Economics' such as 'Treatise on Domestic Economy' (Beecher, E. Catherine, 1841), 'Domestic Receipt Book' (Beecher, E. Catherine, 1842) and 'Household Science' (Jouman, R. Edward, 1857). Such publications were eye openers to the consumers.

1.4.5           The inflationary period of the early 1900s helped the rise of the consumer movement. Similarly the Depression of the 1930s made more people accept the notion that living standards could best be increased, or maintained by the wiser use of existing income and by protective consumer legislation rather than through expanded earnings (William Kelley, T., 1973, p.27). Also "the consumer voice was recognised for the first time through the Consumer Advisory Board" (Garman Thomas and Sidney Eckert, 1974, p.45). Inflation in the late sixties and early seventies provided an impetus for welfare reforms and a call for a minimum income for all Americans.

1.4.6           The only method of organizing a large number of consumers geographically scattered in various parts of a country is the mass media. The 1800s witnessed the growth of printed media. The addition of radio in the twenties and television in the late fifties and all mass media in the sixties and seventies provided a ready outlet for exposing a series of scandals. The first general consumerist outcry came in February 1906 with the publication of Upton Sinclair's

'The Jungle', a devastating exposure of the meat packing industry in the U.S. (Garnan Thomas and Sidney Eckert, 1974, p.46). Similarly in the mid 1930s another scandal relating to the drug industry occurred. The liquid form of a drug called Elixir Sulfanilamide proved lethal to nearly 100 persons. This was followed by another drug scandal on 'Thalidomide' which caused birth deformities in thousands of babies (Garnan Thomas and Sidney Eckert, 1974, p.46).

1.4.7 For a movement to become practical, there should be a number of writers who could draw the attention of others to listen and to act as was the case with the French Revolution which was the result of the writings by Rousseau, Voltaire and others. The flames of consumer discontent have been both lit and fanned by a number of writers whose books have become best sellers. Stuard Chase and Frederick, J. Schlink's book 'Your Money's Worth' compared the market place to <sup>a</sup>wilderness in which consumers wander without chart or compass (Chase Stuart and Frederick J. Schlink, 1927, p.254). 'Skin Deep' in 1934 by Mary Phillips showed that soaps, lipsticks, cold creams, hair dyes and other beauty aids were endangering the health of women and hence urged women to work for stringent laws governing the sale of cosmetics (Mary C. Phillips, 1934). Another book by Frederick Schlink 'Eat, Drink and Be Wary' exposed food adulteration and dietary deficiencies (Schlink Frederick, 1935). 'Counterfeit' by

Arthur Kallet in 1935 pictured the consumer as duped by manufacturers, advertisers and retailers of many well known brands of commercial products (Kallet Arthur, 1938). Ruth de Forest Lamb's 'American Chamber of Horror' showed that men and women all over the country were literally burning their tissues to death in trying to reduce their weight with deadly dinitrophenol (Ruth de Forest Lamb, 1936, p.4). Vance Packard's 'The Hidden Persuaders' charged that advertisers were using motivation research and subliminal advertising to manipulate consumers (Packard Vance, 1957). The same author in his second book 'The Waste Makers' published in 1961, attacked planned obsolescence engineered by the manufacturers. David Caplovitz's 'The Poor Pay More' in 1963 concerning poverty, Marine Newberger's 'Smoke Screen: Tobacco and the Public Welfare' in 1963 on cigarettes and Richard Harri's 'The Real Voice' in 1964 on drug safety all became best selling books. Ralph Nader's 'Unsafe at Any Speed' (Nader Ralph, 1966), John Galbraith's 'The New Industrial State' (Galbraith John, 1967) and Heilbroner's 'In the Name of Profit' (Heilbroner Robert, 1972) were some of the books published during 1960s and 1970s for consumer information.

1.4.8            More writings will not pave the way for a movement. There should be a leader to take the initiative and to lead others to act. People followed Theodore Roosevelt and when, as President, he called for food and drug



legislation, Congress responded in favour (Garman Thomas and Sidney Eckert, 1974, p.46). Dr. Harvey W. Wiley through his speeches, writings, exhibits of injurious and adulterated foods and drugs and his famous "poison squad" helped to arouse the public indignation which eventually forced Congress to take action. Schlink's writings resulted in the formation of Consumer's Research Inc. which published its findings in a periodical to which thousands subscribed. The growing outcry from both the public and Congress was heard by President John F. Kennedy, who in March 1972, sent a message to Congress concerning the consumer interests. The most important aspect was the Consumer Bill of Rights: (1) The Right to safety, (2) the Right to be informed, (3) the Right to choose, and (4) the Right to be heard (McDaniel Carl, 1979, pp.494-495). Another person who was quite influential was Ralph Nader. He appeared on the scene to crystallize many of the issues (Kotler Philip, 1972, pp.48-57). Ralph Nader provided major impetus in the passage of laws in Congress relating to automobile safety, federal inspection of meat, radiation control of television sets and other electronic devices, coal mine safety, gas pipeline safety and the prevention of factory accidents (Adams Thomas, 1976, pp.32-33). Nader's organization known as 'Nader's Raiders' consisting primarily of young lawyers and law students, did receive a great amount of publicity. Nader has many notable achievements in his crusades against big business, the most widely known of which is

his action leading to the stoppage of production of Corvair of General Motors (Mockler Robert, 1975, p.39). The main charge of Nader against General Motors was that the latter was more concerned about profits than human lives (O'Connell and Myers, 1966). Nader wrote a letter to James Gregory, head of National Highway Traffic Safety Administration asserting that nearly all 1974 / <sup>General</sup> Motors, Chevrolets, Pontiacs, Oldsmobiles, Buicks and Cadillacs had defective front wheel control which could ultimately make a car unsteerable. Nader also asserted that G M knew of the defect and failed to notify the agency within the five days from the date of discovery required by federal law (Mockler Robert, 1975, p.59).

1.4.9 Leadership paved the way for a wide variety of private organizations that helped to sustain interest in consumer matters. In 1891 a New York City action group gave wide publicity to shops that treated employees fairly. By 1903 the National Consumer League, an organization devoted to consumer protection, had 64 branch offices in twenty states (Garman Thomas and Sidney Eckert, 1974, p.47). The Chicago Housewives League started in 1910 had established several study groups to accomplish wiser buying techniques (Kelley T. William, 1973, p.15). The Detroit Housewives Group which emerged in the mid 1930s as a result of an upturn in consumer prices was another pressure group for consumer protection (Garman Thomas & Sidney Eckert, 1974, p.45). In November

1972, the 'Consumers' Union' opened a full time Washington law office whose assignment was to use data developed for the Consumer Reports magazine as the basis for legal action. 'Consumers' Union' also set up 'Consumers' Interests Foundation', which solicited tax deductible donation in order to initiate research and normal product testing outside the 'Consumers' Union'. Another citizens' group trying to protect consumers' rights was the 'Health Research Group' subsidised by Ralph Nader's Public Citizen, Inc. This group charged in a letter to the Consumer Product Safety Commission (CPS) that decorative candles with metal cored wicks contained "highly dangerous concentrations of lead". Hallmark Cards, Inc., Lenox, Inc., Corning Glass Works, Rust Craft Greeting Cards, Inc., and Muench Kreuzer Candle Co. were named as the manufacturers of these candles. The CPS Commission announced that it had initiated testing of sample batches immediately (Mockler, J. Robert, 1975, p.59). A list of present day groups representing some form of consumer interests is quite long and includes many unions, chambers of commerce, co-operatives and better business bureaus. The National Consumers' League, the Family Finance Association, the National Council of Better Business Bureaus and the Co-operative League of the United States are some of such large organisations devoted to consumer protection and interest. The American Council on Consumer Interests, the successor to the old council on consumer information, now takes the role of a parent group and

it encourages all professionals in the consumer field through information exchanges.

1.4.10           Several research and action groups also encouraged the consumer movement. Today's largest consumer action group, the Consumer Federation of America, represents approximately 300 local and state organizations. It serves by lobbying in Washington, D.C., on behalf of all the consumers. Although the size of the professional staff is limited, the voice of CFA is being heard increasingly. Most States today have a consumer action group organized on a statewide basis.

1.4.11           Many local, state and federal legislations showed that consumers could be protected. The government prohibited the sale of unwholesome tea in 1883 and barred the import of adulterated food and drink in 1890. Between 1879 and 1905 more than 100 bills were introduced in Congress to regulate inter-state production and sale of goods and drugs (Gaedeke Ralph, 1972, pp.57-59). In the latter part of the nineteenth century State and local governments created commissions to prevent railroads and other public utilities from exploiting the public. This idea was picked up by the federal government with the passage, for example, of the Inter-State Commerce Commission to regulate railroads in the public interest. A major precedent was set in 1906 with the enactment of the Pure Food and Drug Law, which forbade the misbranding of drugs. One year later sanitation in the meat

packing industry came under Congressional Scrutiny and the Meat Inspection Act of 1907 was passed to authorize the Department of Agriculture to inspect slaughtering, packing and canning plants (Steiner George, 1975, p.261).

1.4.12            Around the time of World War-I there was a surge of legislation in the United States to protect consumers. For example, the Clayton Act of 1914 and its creation of the Federal Trade Commission protected consumers from unfair trade practices (Steiner George, 1975, p.261). The Elixir Sulfanilamide drug scandal of the mid-1930s resulted in improved drug and food laws in 1938 (Garman Thomas and Sidney Eckert, 1974, p.46). Many pieces of legislation during this period tightened past laws and added new ones. One noteworthy Act was the Sea Food Act of 1934, which permitted the F.D.A. to inspect processing plants. There were a number of important actions protecting the financial interests of consumers, such as the creation of the Securities and Exchange Commission in 1933. The Wool Labeling Act of 1939 was the first law dealing with a particular type of product (Steiner George, 1975, p.261). In the minor wave of new legislation in the 1950s the Flammable Fabrics Act of 1953 was passed because of indignation resulting from burns suffered by children dressed in flammable materials. Other Acts were passed concerning fur products and textile fiber products. The Kefauver-Harris Drug Amendments of 1962 to the Food and Drug Act required premarket testing of drugs for

efficiency as well as safety and prescribed that the label shows the common or generic name for the drug (Steiner George, 1975, p.261). This brief resume of consumer protective legislation shows several characteristics. Firstly, the range of such legislations covered all industries, but was largely aimed at certain specific industries such as railroads, foods, drugs and electric utilities. Secondly, consumer legislations were passed only after some shocking revelations such as drug scandals. Thirdly consumer legislations often were passed during periods of rising prices when consumer complaints increased e.g. the inflationary period of the early 1900s and the Depression of the 1930s forced the federal government to legislate unemployment programmes and pass social security laws (Garman Thomas and Sidney Eckert, 1974, p.45). Finally, journalistic exposures were important in stimulating interest in protecting consumers.

1.4.13 Consumer movement in India: The Indian buyer is at a disadvantage to exercise his rights as a consumer since there is no powerful organised consumer associations as in the West. However, a number of consumer associations and groups have been formed in India to protect the interest of the consumers. Consumer movement may be described as the organisational activities and attitudes of consumers in their relations to the distribution of goods and services i.e. in exchange relationship between buyers and sellers (Sherlekar, S.A., 1977, p.359).

In order to achieve their ends consumers use two alternatives. Firstly, they substitute collective action for individual action and secondly the consumers turn to the government for protection.

1.4.14 Consumer Guidance Society of India is one of the leading consumer organisations representing consumerism in India. Established in 1966 by nine housewives and a few social workers, it is a voluntary, non-profit and non-political organisation. It has over 1860 members of which 255 are life members, 33 institutional members and 29 associate members. It has five branches in India. The activities of the Consumer Guidance Society of India include consumer guidance, protection, education and representation. The Society protects and promotes the rights and interests of consumers, gives information and guidance through its monthly publication 'Keemat', takes up consumers' complaints with the offending party and fights against all kinds of consumer exploitation. The Consumer Guidance Society of India is represented in important national advisory bodies for consumer protection such as the Central Committee for Food Standards, the Indian Standard Institution Certification Marks Advisory Committee and the Maharashtra State Advisory Board for Pure Food Adulteration and Drugs Control.

1.4.15 Consumer Parliament or Grahak Panchayat in Pune consists of six thousand families. These buying clubs undertake procurement of foodgrains and other consumer items directly from producers. Such buying clubs are found in Bombay, Calcutta and

Pune. These consumer organisations operate on no-profit-no-loss basis. The aim of the organisation is to supply good quality consumer items through reasonable prices. The sales turnover that was recorded in Pune alone during a period of three years was over Rs.3 crores (Sharlekar, S.A., 1977, p.333).

1.4.16           The Janata Grahak Mahasangh was started in April 1975 in Bombay. The organisation has nearly eighty buying clubs. There are seven distribution centres and one centre handles 20 buying clubs. All purchases are made centrally by the Mahasangh and it forwards the supplies for distribution to each of the eighty buying clubs. All middlemen are eliminated in the process and better quality goods are made available at reasonable prices.

1.4.17           The Consumer Education and Research Centre, Ahmedabad, is an organization for representing the interest of consumers in India. The organization is a non-political, non-profit making body established with a view to create awareness among consumers about their rights and initiate action. Consumer awareness is created through action-oriented information and education. The Centre brings out two journals 'Grahak Suraksha' and 'Consumer Confrontation'. The organization undertakes research studies on specific issues which are compiled in the form of publications for circulation. The Consumer Education and Research Centre has 61 consumer



federating units in India on its record (Consumer Confrontation, June 1983, p.20). The organization adopts the role of a mother organization and makes available its expertise to other organizations and individuals. The Organization is recognised by the Central and State Governments.

1.4.18 Besides these organizations, there are other consumer organizations which have been formed in various parts of India for solving the problems of consumers. Chief among them are: The Consumer Council of India (New Delhi), the Fair Trade Practices Association (Bombay), The Council for Fair Business Practices (Bombay), The Indian Federation of Consumer Organizations (Bombay), Public Interest Law Service Society (Cochin), Consumer Action Forum (Calcutta), Consumer Society (Coimbatore), Consumer Service Society (Delhi), Consumer Society (Hyderabad), Consumer Council of India (Madras), Consumer Association (Madras), Consumer Protection Forum (Trivandrum), The Citizens' Forum (Hubli) and Balrashi Society (Jaipur).

1.4.19 Demands and protests of consumers: Many consumer groups have protested against false weights and measures used in different parts of the country. Tanjore and Trichinopoly, Mathura and Agra, Balasore and Cuttack, Burdwan and Hooghly, which were not at a great distance, did not use identical weights and measures in commercial transaction (Banerjee Tarasankar, 1966, p.109). According to a study on deceptive

and defective weights and measures by Weights and Measures Organisation of the Government of India, on the basis of five per cent short weight or measure, the loss to the consumer public is round about Rs.1,400 crores a year (Reddy Subbi, T., 1981, p.190). Ten consumer organisations in Ahmedabad, India, called a meeting with the Controller of Weights and Measures to discuss the problem of short measurements used in suburban parts of the city. The consumer organisations also requested for a forum providing for a continuous dialogue with the department (Consumer Confrontation, January 1984, p.17).

1.4.20 Another reason why consumers have organised themselves in India is to protest against the adulteration of foodstuffs and drugs. In a recent report by the Indian Technological Research Institute 25 per cent of foods that we eat today are found to be adulterated (Reddy Subbi, T., 1981, p.189).

1.4.21 Consumer groups have from time to time protested against misleading advertisements of consumer items. The Consumer Guidance Society of India, Bombay, confirmed through an experiment that Wilofill filters do not eliminate cholera germs from tap water as advertised by them (Consumer Confrontation, June 1983, p.7). A major issue of misleading advertisement pursued by the Consumer Education and Research Centre was with M/s. M. Ravji and Company, Ahmedabad. They were making the

claim "Vitamins A & D added" to Pankaj groundnut edible oils in their advertisement and had proclaimed it on the labels of the tins. Analysis of the oil found that the oil does not contain any extra dose of vitamins A & D. Consequently the Centre demanded from M/s. M. Ravji and Company that they discontinue the claim and give a corrective advertisement to inform the consumers of their mistake. Accordingly, the manufacturers discontinued this claim in their advertisement on the labels of the tin with effect from October 1980 (Consumer Confrontation, June 1983, p.12).

1.4.22 The construction of defective electrical appliances and lack of information on safety measures are other areas where consumer organisations have protested. The Consumer Education and Research Centre lends a helping hand in solving consumer complaints pertaining to different areas.

1.4.23 Strategies and tactics used by consumer groups: Some of the strategies used by the Citizens' Forum, Hubli include creating public awareness among the public through the publication of its findings in newspapers and magazines. The Forum educates the consumer about the detection of the adulteration of foodstuffs and the frauds in weights and measures. It arranges exhibitions to create awareness (Consumer Confrontation, January 1984, p.24). The Consumer Education and Research Centre at Ahmedabad also creates consumer awareness through the mass media.

1.4.24 The Citizens Action Group, Bombay analyses and formulates issues affecting public at large. When all the avenues of discussion and persuasion fail and the authorities concerned do not positively respond, the issues are then taken to court of law. Vistānagaram Consumers' Council represents clients who cannot afford representation and whose cases pose important public policy questions. (Consumer Confrontation, April 1984, p.14). The strategies used by the group include litigations primarily against government-managed commercial organisations such as Civil Supplies Corporation, State Electricity Board, etc. (Consumer Confrontation, April 1984, p.14). The Consumer Education and Research Centre, Ahmedabad takes recourse to courts for redressal of consumer grievances.

1.4.25 The Consumer Education and Research Centre, Ahmedabad approaches Members of Parliament and Members of the Legislative Assemblies and lobbies with them for taking up consumer protection issues. The Centre trains workers and leaders to carry out academic programmes for the consumer movement. The Centre directly handles around 700 petty grievances sent in from all parts of the country (Consumer Confrontation, September-October 1984, p.16).

1.4.26 Achievements of consumer groups: Many consumer groups and organisations found in different parts of the country have succeeded in achieving their objectives. The Citizens' Forum

Hubli feels that the society has succeeded in improving the quality of government dairy milk, after the persuasion of the forum (Consumer Confrontation, January 1984, p.24). Another success of the Citizens' Forum Hubli includes the refund of money deposited by consumers at the Karnataka Housing Board (Consumer Confrontation, January 1984, p.24).

1.4.27           The Visianagram Consumers' Council succeeded in streamlining the delivery of LPG gas refills. Other achievements of the organisation include the installation of new water lines in certain areas of the town, and making the electricity authorities to issue metre reading cards (Consumer Confrontation, April 1984, p.14).

1.4.28           The Citizens' Action Group of Bombay succeeded in preventing the installation of guard railings, which were obstacles for pedestrians (Consumer Confrontation, August/September 1983, p.34). Other achievements include the introduction of house-to-house refuse collection system and the issue of 'Clean School Trophy' and 'Clean Station Trophy' for motivating people to keep their surroundings clean and healthy (Consumer Confrontation, August/September 1983, p.34).

1.4.29           The Consumer Education and Research Centre, Ahmedabad filed a writ petition in Gujarat High Court in 1983 against the government of Gujarat alleging that it had vindictively withheld the sanctioned grant of about Rs.1.51 lakhs for the year 1981-'82. After hearing the parties the court

directed the government to release the grant amount of Rs.1,51,600 for the year 1981-'82 within a period of 6 weeks of the receipt of writ at their end as sanctioned by the Committee under the Scheme for Grant-in-Aid for Consumer Associations (Consumer Confrontation, January 1984, p.3). Other achievements of the Consumer Education and Research Centre include successful resolutions of complaints lodged by individual consumers for redressing certain grievances.

1.4.30 Literature on the failures of consumer groups and organizations are not available from publications. This does not imply that most of such groups and organisations have succeeded in their efforts. It is quite possible that a detailed research with primary data may reveal many more failures than successes of these groups.

1.4.31 Consumer and government: Several measures were taken by the government to deal with the problems of consumers. To prevent black marketing, hoarding, adulteration, false weights and measures, the government used four methods.

1.4.32 One method used by the government to protect the consumer is the system of public distribution of essential commodities at cheaper rates. Under the Essential Commodities Act, 1955 the governments, both central and state, have passed several orders regulating the supply, distribution and prices of essential commodities. Establishment of ration shops,

Civil Supplies Corporations and introduction of short term bazaars during festival periods are methods used by the government for proper distribution and price control.

1.4.33 A second method followed by the government is the setting up of standards for consumer products and industrial products through various government institutions such as Indian Standards Institution (ISI).

1.4.34 Another method consists of the promotion of consumerism activities by encouraging the formation of consumer protection organizations and granting them financial assistance on a regular basis (Consumer Confrontation, April 1984, p.5). The government also encourages formation of Co-operative societies for the benefit of consumers.

1.4.35 The fourth method was enactment of legislations to ensure the safety, quality and reliability of consumer products. In order to facilitate grading of agricultural produce in India, the Agricultural Produce Act was passed in 1937. This Act provided for the fixation of grade designations for several agricultural products. In 1940 the Drugs Act was passed. The Indian Standards Institution Act was passed in 1952 to assure the consumer that the goods or services so certified have been inspected, tested and can be purchased with assurance of good quality. To check the adulteration of food articles the Prevention of Food Adulteration Act was

passed in 1954. Other pieces of legislation include the Fruit Products Order of 1955, the Essential Commodities Act of 1955, Weights and Measures Act 1958 and Packaged Commodities Order 1975. The Essential Commodities Act of 1955 has been amended in 1974 to ensure quicker and more effective action against the anti-social activities of profiteers, hoarders and black-marketeers. The Packaged Commodities Order 1975 was prepared as <sup>a</sup>measure of consumer protection. From time to time various Acts have been passed by the government to protect the rights of consumers. Sale of Goods Act was passed in 1979 incorporating the changes effected earlier particularly by the Supply of Goods Act of 1973.

1.4.36 Present state of affairs: Compared to other developed countries, the number of regular consumer groups/organizations are very few in India. Various reports published by these groups/organizations in magazines such as the 'Consumer Confrontation', 'Grahak Suraksha', 'Keemat', 'Jagrut Nagarika', 'Consumer' and 'Consumer Bulletin' show that the consumer movement is emerging from its embryonic stage. Worth mentioning in this respect is the enthusiasm shown by the Managing Trustee of Consumer Education and Research Centre. Under the leadership of Professor Manubhai Shah, the Centre is expanding its activities to various parts of the country. At present it has 61 consumer organizations in various parts of India (Consumer Confrontation, June 1983, p.20). Various cases from faulty electrical appliances to cases of cheating or delay of service



are handled by the Centre from various parts of the country. Professor Shah of the Centre addresses several public meetings on consumer protection, where talks are delivered on consumer problems. Besides, consumer associations/organizations which have become successful and the strategies used by the group are studied by the Centre (Consumer Confrontation, January 1984, p.20). On the whole well organized associations in India have proved successful in solving a number of cases. With the encouragement given by Professor Manubhai Shah of the Consumer Education and Research Centre, a number of consumer associations/organizations are likely to function for the benefits of consumers in various parts of India.

#### 1.5.0 Pressure Groups and Business Organisations: The 'Sons of the Soil' Movement in India:

1.5.1 Another social phenomenon that affects management policy decisions is the demand for employment opportunities, especially for regional and local people by certain social pressure groups. In India this movement of pressure groups for employment in industrial organizations was termed during the 1950s as the 'Sons of the Soil' movement.

1.5.2 India is a land of heterogeneous castes, religions, languages, tribes and cultures. Yet one of the achievements of independent India has been the establishment of an Indian nation... uniting the people of India under the same basic law, applicable to all parts of the country. A

citizen of India is accepted, legally as a citizen in every part of the country with almost all the benefits and privileges that a citizen of India is entitled to. The right to migrate within India is, moreover, guaranteed by the Indian Constitution, which specifies that all citizens "shall have the right to move freely throughout the territory of India" and "to reside and settle in any part of the territory of India" <sup>(Weiner, Myron 1978 p.25)</sup> (~~Constitution of India, Article 19~~).

**1.5.3 Factors that contributed to the rise of the 'Sons of the Soil' Movement in India:** There are many factors that contributed to the rise of 'Sons of the Soil' Movement in India. Social, political, economic, linguistic, religious and cultural factors that directly or indirectly contributed to the nativist movements and the 'Sons of the Soil' movement are discussed below.

**1.5.4 Reorganization of Indian States along linguistic lines:** After the reorganization of States along linguistic lines to create a closer knit between ethnicity, territoriality and political power, the numerically dominant linguistic group in each State made a special claim to the territory it occupied and to any economic and educational activities that took place within it. Thus the Assamese claimed that they should be preferred over Bengali migrants and their descendants, and the Marathis claimed that they should be given employment in preference to Tamils. Even late Prime Minister Mrs. Indira Gandhi and many officials of the Central Government declared that in

employment preferences should be given to local people or, as they are called in India, 'Sons of the Soil' (Weiner Myron, 1978, p.13).

1.5.5 Increasing unemployment: Rapid population growth and expansion of education in school, college and university levels generate large scale unemployment crisis in a situation where the employment market is not expanding as fast as the number of entrants. Members of the middle class often move from one urban centre to another in search of employment. This broad social category includes matriculates, graduates, technical and professional classes who move to large towns and cities in search of employment or in search of better jobs with higher salaries.

1.5.6 Concentration of industries in selected areas:

Migration usually concentrates on important commercial and industrial centres in India. For several decades there has been a movement of Munda, Oraon and Ho tribesmen and women from districts of Chota Nagpur in Southern Bihar and districts of northern Orissa to the tea plantations in the hill areas of Assam. Similarly the tea and coffee plantations of Kerala and Mysore are another attraction. Large hydroelectric <sup>projects</sup> and irrigation works have attracted migrants to Ganganagar district in Rajasthan and Nizamabad district in Andhra. The industrial belt around Calcutta, the industrial complex in and around Bangalore, the Bombay region, southern Bihar with its coal mines, steel mills, heavy engineering plants and Kolar mines

in Mysore receive a stream of migrants. According to the 1961 Census the major migrations have been to West Bengal, Maharashtra, Punjab, Assam, Mysore and Madhya Pradesh (Census Atlas 1961, maps 60, 61 and 62).

**1.5.7 Linguistic minorities:** There are four categories of linguistic minorities in India who do not have a "home" state (Weiner Myren, 1978, p.27). The first category of linguistic minorities include those linguistic groups moving from one state boundary to another without a home state. At least seven languages are spoken according to the 1971 figures, namely Urdu, Santali, Bhilli, Gondi, Konkani, Kurukh, Oraon and Pahari. Two non-Indian languages Sindhi and Nepali are also widely dispersed. The second category includes languages that are indigenous to a single state and whose speakers constitute a minority within that state, though they may constitute a majority of the people living within a single district or several districts. Examples include the many languages spoken by India's 38 million tribals. There are also many variants of Hindi some of which are quite distinct, that are spoken in regions of the Hindi-speaking states. A third category of linguistic minorities includes those who speak the language of a contiguous neighbouring state and who are a minority by virtue of the way in which state boundaries have been drawn. When India's state boundaries were redrawn in the mid-1950s to create linguistic states many villages, towns and even parts of districts were left out thereby creating pockets of linguistic

minorities. Inter-state migrants are the fourth major category of linguistic minority. Examples include those who move from the Hindi-speaking state of Uttar Pradesh to the neighbouring state of Bihar.

1.5.8 Division of labour: When relevant skills are required for a new economic activity it is but natural that the local population may or may not possess the necessary skills and as a result local population resent outsiders appointed on the basis of skills and qualifications.

1.5.9 Mass media: The growth of education and exposure to newspapers, radio, cinema and television have made individuals aware of new employment opportunities away from their homes. The improvement in the means of transportation like rail, road, water and air makes it possible for individuals to go long distances and still be able to return home at frequent intervals.

1.5.10 Cultural or political groups: In recent years cultural groups that are part of a larger political identity have been asserting the autonomy of their own culture. These are now nascent movements for more cultural and, in some instances, even political autonomy among Kumaoni, Konkani, Bhojpuri and Maithili - speaking people and among many tribes in north eastern and central India, and there are substantial sentiments in Andhra, Maharashtra, Madhya Pradesh, Assam and Bihar for the creation of smaller states based upon the cultural and historic affinities of people who live within regions of

these states (Weiner Myron, 1978, p.29).

**1.5.11 Statehood for religious and tribal communities:** The Sikhs, a religious community who asserted <sup>their</sup> claim for a linguistic state, were given a state of their own called the Punjab; the residual territory became Haryana. Similarly the hill areas of India's north east, the Mizo tribes were given their own state Nagaland; the Khasis and Garos were given the state of Meghalaya; the Mizos formed Mizoram; and the various hill tribes of the north-east frontier formed Arunachal Pradesh. In southern Bihar a transtribal political party has called for the creation of a state for the tribals of the region.

**1.5.12 Specialised economic functions:** Every city and town in India consists of migrant people with specialised economic functions. In Madurai, the weavers originate from Saurashtra; in Bombay, the city's milk is delivered by migrants from Uttar Pradesh, the port labourers are from Andhra, the clerical personnel are from Tamil Nadu and construction workers are from Rajasthan. In the famous Chandni Chowk bazaar of old Delhi each specialised section of the bazaar is run by a caste whose members come from and continue to be linked to other bazaars in towns of northern India. There are also some kinds of jobs that the local population does not seek and for which migrant labourers must be imported. Thus Bengalis do not ordinarily take jobs as rickshaw pullers, but leave it to Bihari migrants. Similarly construction work by Telugu and Rajasthani low caste

landless labourers is not often sought by most local urban dwellers, even when there is unemployment. Besides labourers, major industrial enterprises are owned by outsiders like Marwaris from Rajasthan, Parsis from Bombay and by Gujaratis, Punjabis and Sindhis in different parts of India.

1.5.13 Nativist movements: There were a number of instances in the political history of India to balkanise the country in terms of language, culture and religion. States were reorganised in 1956 resulting in formation of linguistic states. The situations in the 1980s in Assam and Punjab are indications of the continuing trend of the influence of socio-political pressure groups demanding autonomy or separate status region, based on some considerations to language, culture and/or religion. This section of the thesis deals with important nativist movements in India which in essence were indirect forces that encouraged the 'Sons of the Soil' movement.

1.5.14 Assam and its Migrants: Presence of a large number of Bengalis in Assam has given rise to nativist sentiments and massive conflicts over language, education and employment policy. In the latter part of 1972 large scale anti-Bengali riots erupted throughout the Brahmaputra valley. The dispute began when the Academic Council of Gauhati University passed a resolution calling for the introduction of Assamese as the medium of instruction. The council made two concessions to the linguistic minorities in the state: 1) English was to be retained as the medium of instruction for a specified period,

(2) students could answer their examinations in English and Bengali as well as in Assamese. Almost immediately, demonstrations by Assamese students broke out in Gauhati, demanding that the option of taking examinations in Bengali be withdrawn. As demonstrations led by the All Assam Students Union spread to other towns the Academic Council met to reverse its decision. The District Congress Committee, the Youth Congress and a group of Bengali leaders filed a petition with the Supreme Court that the University's decision was in violation of Article 30 of the Indian Constitution, which assured protection for linguistic minorities. Stay order was granted. Thus the State legislative assembly of Assam reaffirmed the decisions of the academic council and, at the same time, resolved that a separate university be established in Cachar district where Bengalis were predominant. Three important groups in the Brahmaputra valley namely the All Assam Students Union (AASU), the Action Committee of the Teachers of Gauhati University and the Assam Sahitya Sabha opposed the resolution. AASU declared that the Assembly had "failed to give due recognition to the Assamese language" and that their decision would "endanger the existence of Assam and the Assamese people" (Weiner Myron, 1978, p.119). Thus large scale rioting and arson against Bengalis broke out in one town after another and the government was forced to bring in the military to re-establish order. At this point the government assured the AASU that it would accept the recommendations of the two universities on the question of



medium of instruction and would introduce Assamese as a compulsory subject in all non-Assamese secondary schools in the state.

1.5.15 The Telengana movement: In 1969 a movement developed in the city of Hyderabad that quickly spread to towns throughout the western districts of Andhra Pradesh in the region known as Telengana, a movement demanding that jobs for the people of Telengana be "safeguarded" against the Andhras, that is, people in the eastern part of the state. In the early part of 1969 two groups of students at the Osmania University took out separate demonstrations, one called for 'safeguarding', while the militant group demanding the separation of Telengana regions from the rest of the state. On the other hand students in the eastern part of the state protested the anti-Andhra student agitations in Hyderabad. Agitations spread throughout the state. Looting, arson and destruction of public property were some of the methods employed by the pressure groups. The government sent in troops to restore order, thousands were arrested and the university was closed. The violence subsided, but the movement continued to grow. State government clerks, the Teachers Union and non-gazetted officers also joined the demand for safeguards against the Andhras. In 1969 an organization called the Telengana Praja Samiti was formed to demand a separate state and reservation of jobs for the domiciles in a new Telangana government. Groups of Telangana Praja Samiti

were quickly formed in towns and rural areas of Telangana. At this point new ordinances and constitutional amendments were passed, while the state of Andhra Pradesh was kept intact. But Andhra Pradesh was divided into three regions for purposes of admission into educational institutions. Of the total seats in all the government colleges and universities 85 per cent were reserved for candidates from the region in which the educational institution was located (Andhra Pradesh Educational Institutions Order, 1974). The Telangana movement however succeeded in extending the principle of preference to the sons of the soil within the states.

1.5.16 Shiv Sena: In Bombay, a city known for the wide variety of its linguistic, religious and cultural communities, a political party called the Shiv Sena had demanded that jobs in the city be reserved for Maharashtrians. The Shiv Sena was hostile towards the Tamil migrant population for occupying middle class jobs sought by the local Marathi-speaking population. Within two years of its founding in 1966, the Shiv Sena became the largest single opposition party in the Bombay municipal elections. And though the Shiv Sena did not gain power in the State Government, the governing Congress Party adopted many of its demands: by putting pressure on private employers to recruit Marathi-speaking people rather than migrants, by giving preference to local people for employment in the state government and by tacitly supporting moves to

place Marathi signs on both the public and private places, so as to convert Bombay from a Cosmopolitan Multiethnic Centre to a Marathi city (Weiner Myron, 1978, p.266).

1.5.17 Kannada Chaluvalligars: In the late sixties, a group known as the 'Kannada Chaluvalligars' emerged in the state of Mysore now known as Karnataka. This group demanded that restrictions be imposed against Tamil, Malayali and Telugu migrants in the state and that employment preferences be given to the local Kannada-speaking population.

1.5.18 In other States nativism has taken a less organized and generally a less virulent form, but it has been present. Meghalaya has adopted a residential permit bill that requires that persons from outside the state have to obtain a permit from governmental authorities even to stay in the State for more than four months (Weiner Myron, 1978, p.267). In Kerala agitations demanding jobs for local people have been prevalent in many parts particularly at the Vikram Sarabhai Space Centre, Thumba. The States such as Assam, Maharashtra, Karnataka/<sup>and</sup> Tamil Nadu which registered net inflows have been more vocal than others in demanding employment for the 'Sons of the Soil'.

1.5.19 There is another group within the local community which demanded employment in industrial organizations as a right for providing land for the construction of industrial units. According to this group, they were evicted from their

own lands for the construction of industrial units and hence were entitled to get jobs in such industrial establishments. Evicted people formed associational groups and raised their demands for employment, directly to the management of industrial units and they even resorted to slogan shouting, satyagraha and other tactics. In Kerala most of the industries located in the Eloor-Kalamassery industrial belt had faced this problem from the local groups during the initial stages of industrial projects.

1.5.20 As conclusion one could draw that the 'Sons of the Soil' movement in industry is an area which has not been explored in depth. It remains a good area for further exploration in a country where the Constitution gives freedom to reside and apply for employment in any part of the territory of India. As the area of the present study is confined to Environmental Protection Pressure Groups, the 'Sons of the Soil' movement has not been dealt with in detail in this thesis.

1.6.0 Pressure Groups and Business Organisations:  
Environmental Protection Pressure Groups

1.6.1 Social pressure groups for the maintenance of environmental hygiene is a recent phenomenon in India. Very often such groups come to the forefront through the news media by their protests against industrial pollution and projects that create ecological imbalance. The controversy

over the famous 'Silent Valley' hydro electric project is an example of the influence of environmental protection pressure groups in changing the decision of Kerala Government.

1.6.2           The present study focusses attention on the social phenomenon of environmental protection pressure groups in Kerala. A detailed historical background of environmental protection pressure groups at the international and national scenes as a background for this study is presented in Chapter-III and IV. Empirical studies of environmental protection pressure groups in Kerala with special reference to industrial pollution are discussed in detail in subsequent chapters.

#### SCOPE, METHODOLOGY AND LIMITATIONS OF THE STUDY

##### 1.7.0    Scope: Objectives and Problems

1.7.1           The main purpose of the study is to identify the factors that make pressure groups succeed or fail in achieving their set objectives. The factors include the structure and strategies of social pressure groups and the support they receive from the environment. More specifically the present research study intends to investigate:

1.7.2           Perception of and reaction to environmental hygiene/protection, environmental pollution and tactics and

strategies of pressure groups against environmental pollution by the relevant segments of the public, i.e., medical practitioners, veterinary surgeons, local farmers, managers, trade union leaders and other social groups.

1.7.3            Origin, development, structure and types of pressure groups for environmental protection functioning within the Eloor-Kalamassery industrial belt.

1.7.4            Strategies and tactics adopted by environmental protection groups in Kerala to achieve their objectives.

1.7.5            Regulatory framework and public interest litigations relating to environmental pollution.

1.7.6            To understand the pressure group dynamics, including structure and strategies, one has to trace the historical background of the origin and development of pressure group at the global and national levels.

1.7.7            An integral part of the study is management's reaction to the demands, tactics and strategies of environmental protection pressure groups. An attempt on this aspect was made by the researcher, but most of the managements did not respond to the questionnaire. However, the researcher made another attempt to collect data on the reactions of individual managers and trade union leaders, but not official reaction of the management of organisations.

### 1.8.0 Selection of the samples

1.8.1 Since most of the chemical industries - industries which contribute to air and water pollution - in Kerala are situated in the Eloor-Kalamassery industrial belt, it was decided to confine the study to this area. The Eloor-Kalamassery industrial belt comprises of three Panchayats namely Eloor, Kalamassery and Kadungalloor Panchayats. The total population in the three panchayats together is 79,813 (1981 census) i.e. Eloor Panchayat consists of 11,192 males and 9,533 females, Kalamassery Panchayat consists of 9,505 males and 8452 females and Kadungalloor panchayat consists of 8,894 males and 8,569 females (1981 census). Appendix-I show the population distribution in Eloor-Kalamassery industrial belt.

1.8.2 Instead of attempting to cover the total population in the area, the population was segmented into 6 groups viz. medical practitioners, veterinary surgeons, social group for environmental protection, farmers, managers and trade union leaders. Separate questionnaires were distributed to each segment.

1.8.3 Selection of medical practitioners: The Eloor-Kalamassery industrial belt consists of eight hospitals with a total strength of 30 doctors, 14 clinics with 22 doctors and three primary health centres with six doctors. Since the total number of doctors in the area is only 62 it was decided to represent the entire population. Appendix-II (a) shows the

map of Eloor-Kalamassery industrial belt with the location of hospitals and medical centres. Appendix-II (b) shows the sample questionnaire for medical practitioners.

1.8.4 Selection of veterinary surgeons: There are two veterinary hospitals in Eloor panchayat each having one surgeon. Kalamassery panchayat has one veterinary hospital with one surgeon and Kadungalloor panchayat has one veterinary hospital with one surgeon. The total strength of surgeons in the four hospitals is four. Their number being quite small it was decided to represent the entire population. Appendix-III shows sample questionnaire for veterinary surgeons.

1.8.5 Selection of social pressure groups for environmental protection: Since the social pressure groups for environmental protection were found to be small in number in the Eloor-Kalamassery industrial belt, the scope was widened to include all the available environmental protection pressure groups functioning in various parts of Kerala. Nearly 60 questionnaires were distributed to the office bearers of 19 associations/environmental protection pressure groups in 4 places in Kerala - 15 each for each geographical centre. Cochin, Calicut, Trivandrum and Vellore are the places where such pressure groups were found very active. A list of such groups for environmental protection is given in Appendix-IV (a). Sample questionnaire for environmental protection pressure groups is given in Appendix-IV (b).



**1.8.6 Selection of farmers:** In the case of farmers a 20 per cent sample was drawn by using the random sampling method (Tippett's method) and nearly 120 questionnaires were distributed to 120 farmer families residing within a 5km. distance from the Fertilizers and Chemicals Travancore Limited.

Appendix-V(a) shows the map of the area covered for taking the sample of farmers. Sample questionnaire for farmers is given in Appendix-V(b).

**1.8.7 Selection of managers:** There are 16 chemical units situated in the Eloor-Kalamassery industrial belt. At the initial stage questionnaires were distributed to each chemical unit. But lack of co-operation from the management resulted in failure to obtain the necessary data. To compensate this, it was decided to take another approach and a second questionnaire was prepared to collect data from individual managers. The study was concentrated on three units consisting of 250 senior level managers. Fifty (20%) managers were selected on a random basis after preparing a list of senior level managers in alphabetical order. Appendix-VI shows the sample schedule for managers.

1.8.8 Selection of trade union leaders: There are 11 trade unions in the three units together. Thirtythree questionnaires were distributed to Presidents, Vice-Presidents and Secretaries of each trade union.

Sample

Schedule for trade union leaders is given in Appendix-VI

### 1.9.0 Methods Used for Data Collection

1.9.1 As a preliminary step, personal interviews were held with some selected medical practitioners, veterinary surgeons, farmers, social groups for environmental protection, managers and trade union leaders for the preparation of the questionnaire. The draft questionnaire for each segment were pretested among a cross section and refined for the final version of the questionnaires as tools for data collection. The original questionnaires, after pretesting, were modified since some of the data sought were considered by the respondents too confidential to be disclosed. Primary data were collected through such pretested and refined questionnaire for eliciting responses from medical practitioners, veterinary surgeons, farmers, social groups for environmental protection, managers and trade union leaders.

1.9.2 Data/Information were collected from secondary sources also. The following cases were prepared and presented

in Chapter-IV of the thesis on the basis of such secondary data/information and in certain cases by direct investigation by the researcher:

1. Periyar Bund Action Council
2. Farmers' protest against a chemical industry
3. A panchayat against radiation pollution
4. Local people against pollution caused by the Hindustan Paper Corporation
5. The Mavoor Rayons and the Chaliyar river
6. Environmental protection demands in Kalamassery-Eloor area
7. The Silent Valley Protection Movement\*

1.9.3           The questionnaires were mailed to the sample selected for the purpose. Nearly 30 per cent responded to the questionnaire mailed without any reminder being sent to them. In the case of others a vigorous follow-up by means of repeated reminders, personal visits, telephone calls etc. had to be made. The researcher could get nearly 50 per cent of filled questionnaires, which is considered reliable for analysis and interpretation.

#### 1.10.0   Clarification of Main Concept Used

Concepts used in this thesis are defined as follows:

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\*Silent Valley has been included as a case at the national level, though they are not directly linked with the thesis.

1.10.1 Pressure groups: A social group that is not a part of the government and does not itself seek to govern the country or any specific organization in its own name, but does seem to influence that government or organization for its own purposes.

1.10.2 Interest groups: Formal or informal groups of people who share one or more common aims or concerns and who are trying to influence the course of events in particular governmental or organizational policies so as to protect and promote their interests.

1.10.3 Lobbying: This is a technique used by pressure groups to influence members of legislature or other policy decision makers in order to enact laws, or implement decisions for achieving the objectives set by pressure/interest groups.

1.10.4 Environmental pollution: The unsafe discharge of waste, sewage, filth and gaseous pollutants into the neighbouring atmosphere and rivers thereby affecting the health and well-being of human, animal and plant life.

1.10.5 Environmental hygiene: Environmental conditions conducive to better physical and mental health of the members of community living in the vicinity and physical conditions for the health and growth of animals and plants in the area.

1.10.6 Environmental protection: That part of resource management that is concerned with protection from the harmful

physical effects of substances that are discharged into the environment (Allaby Michael, 1979, p.184).

1.10.7 Perception: Interpretation of sensory data experienced by an individual. Perception is highly influenced by objective factors in the environment and subjective factors in the individual by his personal experience.

1.10.8 Reactions: Viewpoints, opinions, ideas and judgements of an individual regarding objects, events and/or situations. And such reactions are often exhibited through verbal expressions and actions.

1.10.9 Strategies: The course of actions resorted to - usually long range rather than immediate - by an organisation, group or individual for the attainment of their/his specific objectives/goals within a time frame.

1.10.10 Tactics: A short term or/an immediate course of action resorted to by an organisation or individual for the achievement of short term and/or to overcome an immediate/or unexpected problem as a consequence of counter strategies of an opposite party.

1.10.11 Public Interest litigation: Legal means to uphold the rights of citizens or a group of people when the rights of the citizen/group are not protected by the administrative or executive system at the societal or organisational levels.

**1.11.0 Presentation of the Thesis (Chapterisation)**

**1.11.1 Chapter-I is an introduction on the nature and characteristics of the pressure groups in a pluralistic - democratic society. Consumerism**

and employment for the sons of the soil are the areas which have been introduced to show the role of pressure groups on management decisions from time to time. Discussion of the role of pressure groups demanding a better environment free from industrial pollution is given separately in Chapters-III, IV and V of the thesis.

**1.11.2 Chapter-II gives a detailed account of the nature, characteristics and consequences of the environmental pollution on man, animals, plants, materials and climate.**

**1.11.3 Chapter-III deals with the environmental protection movement at the international and national scene. The chapter describes the development and functions of the various environmental groups.**

**1.11.4 Chapter-IV presents six case studies of environmental protection pressure groups that came into existence as a result of the industrial pollution in selected areas of Kerala. The case of Silent Valley has been included in the chapter as a case study at the national scene.**

1.11.5 The regulations laid down by the government for ensuring environmental protection and some environmental litigation cases relating to environmental pollution are presented in Chapter-V.

1.11.6 Chapter-VI deals with the nature, sources and consequences of the environmental pollution in the Eloor-Kalamassery industrial belt as perceived by the relevant segments of society, i.e. medical practitioners, veterinary surgeons, farmers, managers and trade union leaders.

1.11.7 Chapter-VII presents the reactions of the relevant segments to issues on environmental pollution.

1.11.8 The structure, strategies and role of the environmental protection pressure groups in Kerala for achieving their objectives are discussed in detail within a theoretical framework under Chapter-VIII.

1.11.9 The last section of the thesis gives summary and conclusions of the research work, followed by the list of references, bibliography and appendix.

#### 1.12.0 Limitations of the Study

1.12.1 The main focus of the study was originally confined to the Eloor-Kalamassery industrial belt, but since the number of pressure groups in this area was found quite limited for a comprehensive study other areas in Kerala where

pressure groups were found very active have been included. Especially for the <sup>Study of</sup> structure, strategy and role of pressure groups.

1.12.2           The researcher's original plan was to study the role of environmental pressure groups in changing managerial decisions relating to environmental hygiene and also employment selection. But lack of co-operation from the management in providing relevant data especially on their responses to various items in the questionnaire, forced the researcher to delimit the scope of the study to environmental pollution including the official reactions of the managements. Instead of eliciting reactions of the management on various aspects of pollution, the researcher adopted a different strategy for collecting responses from individual managers and trade union leaders. Managers were requested to give their personal reactions and viewpoints on various items in the questionnaire rather than as official spokesmen of the management of the industrial units.

1.12.3           Emergence of environmental pressure groups in India and Kerala is a recent phenomenon. Adequate literature on the subject was not available in the Indian context and hence literature pertaining to the subject in developed countries, especially the U.S.A. had to be made use of.



1.12.4           The study by its very nature is more of a survey of perceptions and reactions of people on the problem of industrial pollution and role of environmental protection pressure groups. The data obtained were presented to show the commonality and/or variations in responses given by medical practitioners, veterinary surgeons, farmers, managers, trade union leaders and pressure groups for environmental protection. Detailed statistical analysis to arrive at cause-effect relationship, correlations etc., were not resorted to in this thesis. There was certain limitations in analysing the strategy and structure of pressure group as most of the pressure groups available for the study did not respond to all items in the questionnaire. This inadequate response to many items could even be an indicator of inherent weaknesses in the structure of their associations/groups. The researcher did analyse available primary data and try to collect additional data by personal interviews to substitute the inadequacies and incompleteness of the questionnaires filled by the respondents under the category 'social pressure groups'.

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## CHAPTER - II

### 2.0.0 NATURE, CHARACTERISTICS AND CONSEQUENCES OF ENVIRONMENTAL POLLUTION

#### 2.1.0 Our Polluted Good Earth:

2.1.1           The first man who landed on the moon was struck by the beauty of the earth when viewed from afar. Photographs of earth taken by astronauts show continents, laced by rivers and rimmed by sparkling blue oceans. The natural world, as a whole is supremely beautiful with a superb array of landscapes with various species of fauna and flora which are more beautiful than any work of man. Man's concern for the environment is something very new - concern arising from gloomy environmental pictures painted in terms of swarming population and pollution of air, water and land which have changed the beauty of the natural world. Man has turned large areas of his world into junk heaps, fouled the air and water and it is with this justification, Fairfield Osborn wrote a book entitled 'Our Plundered Planet' (Fairfield Osborn, 1968, pp.51-52).

**2.1.2 Relevance of Ecology:** Ecology is mainly about animal and plant populations in their natural environments (Joffe Joyce, 1969, p.23). All living things need an energy supply and they get it from the sun. The sun's energy is used by green plants to manufacture food. Animal life depends directly or indirectly on green plants for their food intake. Plants provide a cover for bare earth and their roots bind the top soil, so that it cannot be blown or washed away. When animals die and plants decay bacterial action plays its role in converting such dead and decayed bodies into simpler compounds such as nitrates, phosphates, and humus. Some of the nutrients enter the air, while the others form an essential part of soil. They are reused and the cycle is repeated. Carbon cycle, nitrogen cycle and hydrogen cycle are repeated and the balance of nature is maintained. Nothing exists in isolation and every living thing is affected not only by other animal species but also by its non-living surroundings such as soil, wind, light, temperature, humidity and so on. Every living thing in nature is well adapted for its way of life in the dynamic equilibrium of its eco-system that helps to perpetuate biological survival and growth.

**2.1.3** Nature is endowed with her own self-cleaning mechanism and history tells us that the earth's air, water

and land were able to clean themselves sufficiently and take care of imbalances, within certain range created by man. But today, nature can no longer absorb either qualitatively or quantitatively the enormous mass discarded by man; therefore, wastes are piling up and literally poisoning the earth with their accumulative effects (Charlier, R.H., 1971, pp.129-39). The balance of nature is disturbed and further aggravation of the situation would result in "Green house effect", the ultimate consequence of it would be melting of ice caps and flooding of the land (Nobile Philip and Deedy John, 1972, p.195).

2.1.4 Environmental Pollution: The problem of environmental pollution is world-wide. Air is constantly in movement around the earth's surface in all directions. Air cannot be increased, but it is constantly recycled. Wind, rain and temperature changes combine to purify the air and keep it moving. Air comprises 78 per cent nitrogen, 21 per cent oxygen, carbon dioxide and other gases such as argon, neon, helium, xenon and hydrogen. Although Arctic air is usually considered pristine, far from any source of pollution,

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\* Carbon dioxide acts like glass windows in a green house, allowing warm rays of the sun to pass in, but holding back, at the same time, the heat radiated by the earth. In this way, it traps and reinforces the solar heating effect and causes what is popularly known as "the green house effect".

measurements at Barrow, Alaska, the Northernmost United States village, have shown it to be remarkably sooty in winter and spring. Scientists say that carbon dioxide content in atmosphere rises by nearly 30 per cent every century which, in turn, raises the earth's temperature by one degree centigrade. In Scandinavia, atmospheric pollution from industrial centres in Europe have already acidified the rainfall to such an extent that aquatic fauna in certain lakes have been modified and, in some cases, destroyed (Brooks, F. Peter, 1974, p.113). Soot and dust from industrial Europe and China may account for a mysterious haze that hangs over Alaska, Greenland and the Arctic ocean every spring (NEERI, July 1979, p.1). The Chinese communist party newspaper "The People's Daily" reported that fifteen of the twentyseven principal rivers in the country were seriously polluted and that faucet water in fortyone of fortyfour cities tested was not safe to drink (NEERI, February 1980, p.4). In Russia the Volga river boatmen are charging that chemical plants are discharging wastes which kill sturgeon and threaten Russia's caviar supply (Davis Keith and Robert Blomstrom, 1975, p.433). A scandal of national proportions broke out recently in Brazil, when it was discovered that upto fortytwo residents of Thailandia might have died after

drinking water contaminated with a chemical agent - possibly dioxin or "agent orange". This happened when the dam contractor used this chemical agent to defoliate 800 kilometres by 100 metres of Amazon jungle to place high tension cable pylons (The Hindu, February 5, 1984, p.19). At present man is changing important features of the biosphere and destroying the habitats of many plants and animals while widely altering his own. <sup>hundred and ninety-nine</sup> Seven <sub>∠</sub> species of plants and animals have become extinct in the United States since 1750 (Julian Joseph, 1980, p.228). In the U.S. alone, over 200 million tonnes of gaseous, solid and liquid waste products are discharged annually into the atmosphere (Wark Kenneth and Cecil Warner, 1976, p.2). The U.S. alone annually discards 48,000 million metal cans and containers, 26 million bottles, 65,000 million bottle caps and lids (Sane, Y.R., 1982, p.6). Urbanization and Industrialization has led to the mass destruction of trees and plants leaving very little green space in some of the major cities of the world. Table 2.1.4 below shows the green space with reference to pollution in some of the major cities of the world.

**Table 2.1.4 (1)****A Comparative Study of Green Space in Acres with Reference to Pollution in Some of the Major Cities of the World**

	<b>New York</b>	<b>Paris (city)</b>	<b>London</b>	<b>Tokyo</b>	<b>Delhi</b>	<b>Bombay</b>
<b>Area in (Sq.miles)</b>	<b>365</b>	<b>41</b>	<b>610</b>	<b>827</b>	<b>573</b>	<b>169</b>
<b>Population (In million.)</b>	<b>7.07</b>	<b>2.05</b>	<b>6.6</b>	<b>8.3</b>	<b>5.7</b>	<b>8.2</b>
<b>Total Green Space (In acres)</b>	<b>37,372</b>	<b>6,381</b>	<b>31,985</b>	<b>5,671</b>	<b>25,000</b>	<b>290</b>
<b>Area of Green Space (In acres) per 100 persons</b>	<b>5.33</b>	<b>3.11</b>	<b>4.84</b>	<b>0.68</b>	<b>4.4</b>	<b>0.03</b>

**Source:**

Venkateswaran, V., "The Hindu", 1964, January 31, p.8.

**2.2.0 Definition of Environmental Pollution and Types of Pollutions:**

**2.2.1 "Environmental pollution is the unfavourable alteration of our surroundings, through direct or indirect effects of changes in energy patterns, radiation levels, chemical and physical constitution and abundances of organisms. These changes may affect humans directly or through their supplies of water and of agricultural and other biological products, their physical objects or possessions, or their opportunities for recreation and appreciation of nature" (Hodges Laurent, 1977, p.4).**

**2.2.2 Pollutants that meet the criteria of this definition of environmental pollution are numerous: gases and particulate matter in the atmosphere, pesticides and radioactive isotopes in the atmosphere and in water ways, sewage, organic chemicals and phosphates in water, solid wastes on land, excessive heating of rivers and lakes etc. Some of these pollutants are introduced into the environment naturally, others by human actions and most in both ways. Based on the sources and their characteristics, pollutions can be classified into various types such as natural pollution, air pollution, water pollution, land pollution, pollution due to radiation, heavy metal pollution, thermal pollution and sound pollution.**



### 2.3.0 Natural Pollution:

2.3.1 The air pollutants derived from nature include swamp gas, salt sprays from the sea, terpenes and resins from forests, fog, noise from thunderstorms, photochemical ozone, nitrogen oxides and other oxidants, gases, vapours and particulates from volcanoes, geysers and fissures.

2.3.2 An estimated 30 million tonnes of dust come from natural sources each year (Ledbetter, O. Joe, 1972, p.78). Table 2.3.2 shows some of the various pollutants and their estimated amounts (Ledbetter, O. Joe, 1972, p.26).

Table 2.3.2 (2)  
Inventory of Pollution Emissions

<u>Pollutant</u>	<u>Yearly Emissions (M.Tonnes)</u>
Carbon monoxide	94
Natural dust	30
Oxides of sulphur	31
Hydro carbons	29
Industrial dust and ash	22
Oxides of Nitrogen	16
Other gases and vapours	2
Pollen	1.7

**Source:**

National Emissions Standards Study, U.S. Senate Document 91-63, Washington, March 1970 and other sources. (As quoted by Ledbetter, O. Joe, 1972, p.26)

2.3.3            Dust storms toss dirt and debris into the air, natural forest fires cast a cloud of smoke over mountain valleys and lightning creates certain chemical compounds. The Director of the U.S. Geological Survey estimates that more than one hundred million tonnes of nitrogen in the form of ammonia and nitrates are precipitated on the earth each year. Geologists say "Nature Equals Man as Despoiler of Earth" (Arizona Republic, 1970, p.14). In the U.S. alone 36 million tonnes of calcium compounds fall on the earth in rain (Davis Keith and Blomstrom, 1971, p.340). The pollution from volcanoes is phenomenal and puts modern pollution clearly in perspective. The Director of the Geological Survey states that only three eruptions in the last one hundred years - Krakatoa in Java in 1883, Mount Katmai in Alaska in 1912 and Hekla in Iceland in 1947 - have produced more air pollution than mankind in all of its history. For two and a half days after Krakatoa exploded off Java in 1883, people had to use lamps in day time within a radius of 80 Kms (The Hindu, April 25, 1984, p.5). From these three eruptions, "more particulate matter in the form of dust and ash and more combined gases were ejected into the atmosphere than from all of mankind's activity" (Davis Keith and Blomstrom, 1975, p.431). Stratospheric dust is known to increase

following volcanic eruptions and its scattering effect is demonstrated by the many accounts of brilliant sunsets following volcanic eruptions (Polunin Nicholas, 1972, p.147). The pollen released everyday by trillions of plants is also another source of natural pollution. The natural production of methane on earth is about  $10^9$  metric tonnes per year (Polunin Nicholas, 1972, p.155). Fogs have been reported to amount to about 15 million tonnes annually (Ledbetter, O. Joe, 1972, p.78). Some scientists believe that once every 26 million years or so comets invade the solar system plunging the earth into darkness and killing many of the animals and plants. The dinosaurs may have been their most famous victims (The Hindu, April, 23, 1984, p.5). In 1979, a U.S. team made a discovery that led to the speculation about what killed off the dinosaurs 65 million years ago. It found that clays of this age contained an abnormally high level of iridium, a metal rare on earth but more common in meteorites.

#### 2.4.0 Air Pollution:

2.4.1 Air pollution is the presence in the atmosphere of one or more contaminants in such quantities, characteristics and duration as to make them actually or

potentially injurious to human, plant or animal life or to property or which unreasonably interfere with the comfortable enjoyment of life (World Bank, 1978, p.1).

**2.4.2 Classification of air pollution:** Air pollution can be classified into three major categories:

- 1) Air pollutants from stationary sources
- 2) Pollution from automobiles and other mobile sources
- 3) Pollution from toxic substances or heavy metals.

**2.4.3 Air pollutants from stationary sources:** Stationary sources generate three major air pollutants, particulates, oxides of nitrogen and sulphur dioxide. In all, almost 200 million tonnes of pollutants are poured into the atmosphere over the United States each year (Julian Joseph, 1980, p.530). Evidence suggests that sulphates are the most damaging of the common air pollutants (Samuel William, 1979, p.58). Sulphur dioxide is a major problem not only because it is a common and dangerous pollutant, but also because it is difficult to control. Not all air pollutants are gases. Some are small bits of solid or liquid matter that scientists call 'particulates'. Smoke and soot are the most common form of particulate pollution. Table 2.4.3 provides rough estimates of the total tonnage of various pollutants from all sources entering the atmosphere in 1974.

**Table 2.4.3 (3)****Total Air Pollutant Emissions by Type**

<b>Type</b>	<b>In millions of Tonnes</b>	<b>Per cent</b>
Carbon monoxide	94.6	47.68
Sulphur oxides	31.4	15.82
Hydro carbons	30.4	15.32
Particulates	19.5	9.82
Nitrogen oxides	22.5	11.34
<b>Total</b>	<b>198.4</b>	<b>100.00</b>

**Source:** Environmental Protection Agency. (As quoted by Seneca Joseph and Taussig Michael, 1979, p.162).

#### **2.4.4 Pollution from automobiles and other mobile**

**Source:** It contributes about 60 per cent of our gross annual tonnage of air pollution and carbon monoxide is one of the worst of the automotive effluents (Mensen Joseph, 1973, pp.20-21). The extent of air pollution in Madras, brought about by heavy traffic can be realised from Table 2.4.4(a) which gives the percentage fall in oxygen concentration of the outdoor atmosphere in some of the busy roads in the city.

Table 2.4.4(a) (4)

Percentage Fall in Oxygen Concentration of the  
Outdoor Atmosphere in Some of the Busy Roads in  
the City

Road	No. of locat- ions chosen	Percentage Reduction in Oxygen (ppm)		
		Minimum	Maximum	Average
E.V.R.Periyar Road (Peona- malee High Road	25	3	24	16.3
Anna Salai	15	8	13	10.7
Walltax Road	7	16	32	24.7
Broadway	3	21.05	23.68	22.8

Source: Ahmed Kabeer, I. and Sultan, A. Ismail, "The Hindu", October 22, 1982, p.11.

The most dangerous results of exposure to carbon monoxide are the serious intoxication and even death that occurs from the release of carbon monoxide from automobile exhausts (Hodges Laurent, 1977, p.60). Carbon dioxide is not normally classified as a pollutant. It is produced by the burning of carbon fuels. Man's use of these fuels has increased the carbon dioxide content of the atmosphere 14 per cent since 1900 (Monsen Joseph, 1973, pp.23-24). Increase in carbon dioxide content of the atmosphere leads to the so-called 'Green house effect' over the earth, holding in more and more heat until eventually life is destroyed (Monsen Joseph, 1973, p.24). Air pollution may have a dangerous long-term

effect on the earth's ecosystem. Preliminary tests that have been performed suggest that fluore carbons may, indeed, be harmful to the earth's ozone layer (U.S. News and World Report, 1975, p.62). However, the greatest source of pollution is the exhaust from the internal combustion engines of today's motor vehicles. Studies have uncovered upto 100 different chemical compounds in such exhaust gases with carbon monoxide, hydro carbons and nitric oxide in that order, being the most plentiful (Hjalte Krister, 1977, pp.69-70). The relative contribution of pollutants by source is indicated in Table 2.4.4(b).

Table 2.4.4(b) (5)

Air Pollutant Emissions by Source (1974)

Source	Quantity in Millions of Tonnes per Year	
	Quantity	Per cent
Transportation	102.0	51.41
Stationary fuel combustion	44.2	22.27
Industrial processes	32.5	16.38
Refuse disposal and miscellaneous	19.7	9.92
Total	198.4	100.00

Sources:

Environmental Protection Agency. (As quoted by Seneca Joseph and Tausig Michael, 1979, p.163).

#### **2.4.5 Pollution from Toxic Substances or Heavy**

**Metals:** The toxic substances range from such natural elements as arsenic, cadmium and mercury to man-made industrial chemicals such as polychlorinated biphenyls and vinyl chlorides, which have no natural components. A survey carried out in the area of the Canadian Great Lakes has shown that rain and snow in the region may carry higher concentrations of certain heavy metals, lead and cadmium in particular, than is permitted for drinking water supplies (Brooks Peter, 1974, p.120). Lead concentrations in U.S. drinking water ranged upto 0.64 mg/l in the 1969 Community Water Supply Study (Hodges Laurent, 1977, p.421). A mercury pollution scare occurred in North America in 1970, triggered by the Canadian discovery of mercury, contaminated fish in lake Ontario (Hodges Laurent, 1977, p.424). The "zinc poisoning" that results from the use of galvanized pails or washtubs for making lemonade or other acidic drinks is really cadmium poisoning (Hodges Laurent, 1977, p.425). Beryllium is a known carcinogen which readily produces lung cancers in test animals such as rats and rabbits (Hodges Laurent, 1977, p.427). Heavy metals and certain insecticides like D.D.T. do not deteriorate in nature. It is characteristic of these substances that they are poisonous even in small concentrations (Hjalte Krister, 1977, p.69). They resist natural



degradation, remain unchanged in the environment and accumulate in what ecologists call the food chain (Mensen Joseph, 1973, p.11). The widely publicized incidents in Japan where many hundreds of persons died from eating fish tainted with mercury and rice containing cadmium aptly illustrates this point. Part of the problem lies in the fact that these substances accumulate in living organisms.

### 2.5.0 Water Pollution:

2.5.1           Next to the air we breathe, water is our most important resource. An adequate water supply is literally a matter of life or death, not only for human beings, but for every form of animal and plant life, from the single celled amoeba to the tallest red wood tree. A man would soon die if he lost as little as 12% of his body's water and almost every organism is heavily dependent on water for more than 50% of its body weight (Leopold Luna, 1970, p.110).

2.5.2           The total amount of water on the earth is about 1.35 billion km<sup>3</sup>. Over 97 per cent of this amount is found in the earth's oceans, and the earth's fresh water totals only about 37 million km<sup>3</sup>, of which four-fifths occurs in the polar ice caps and glaciers (Hodges Laurent, 1977, p.164). Table 2.5.2 shows the locations of the world's waters as estimated by the U.S. Geological Survey.

**Table 2.5.2 (6)**  
**Locations of the World's Waters**

<b>Location</b>	<b>Volume (km<sup>3</sup>)</b>	<b>Fraction (Percentage)</b>
<b><u>Surface water</u></b>		
Fresh Waterlakes	120,000	0.009
Saline lakes, inland seas	100,000	0.008
Stream channels (Average)	1,200	0.0001
<b><u>Subsurface water</u></b>		
Soil and vadose water	65,000	0.005
Ground water (to 800 m.)	4,000,000	0.3
Ground water (deep lying)	4,000,000	0.3
<b><u>Other water</u></b>		
Ice caps & Glaciers	29,000,000	2.1
Atmosphere	13,000	0.001
Oceans	1,315,000,000	97.3
<b>Total (rounded)</b>	<b>1,350,000,000</b>	<b>100.0</b>

**Source:** U.S. Geological Survey, Water of the World, Washington, D.C., U.S. Department of the Interior, 1968. (As quoted by Hodges Laurent, 1977, p.164).

Water pollution can be classified into various types based on the water body it contaminates. The major water bodies affected include oceans, seas, estuaries and pollution due to radiation. The latter include land-based and sea-based activities.

**2.5.3 Ocean pollution:** The world ocean consists of 130950 billion kilometres of sea water which covers most of the planet, leaving only 29% of the surface to the continental land masses (Kiratrai Ravi, 1982, p.6). These oceans, which are the common heritage of mankind, constitute an integral part of humanity's life support system - supplying both food and oxygen. Most pollutants, whether they be from air, land or water, find their way into the ocean. In November 1971, at the meeting of the United States Senate Sub-Committee on "Oceans and the Atmosphere", Professor Barry Commoner warned that "the oceans have become the world's sink and death of the oceans will be the death of us all" (Kiratrai Ravi, 1982, p.6). Reports of pollution from the discharge of junk metal, trace elements, organic wastes from humans and animals, oil spillages, pollution through the activities of exploration and exploitation of the seas, natural resources and the deliberate dumping of waste materials are commonly featured in the press reports. In 1967, one container

of toxic materials was sufficient to kill millions of fish in the river Rhine and create a European scandal (Brooks Peter, 1974, p.37). About 5,000 tonnes of mercury per year are estimated to enter the oceans as a result of the release of industrial wastes into the river and to the atmosphere. Perhaps 100,000 birds were killed in the Torrey Canyon disaster; only about 100 birds survived out of the 5,800 that were caught and cleaned off in an effort to save their lives (Hodges Laurent, 1977, p.217). Wastes are disposed in the oceans either directly or packed in containers. Both ways are harmful and it makes the ocean a "dead sea". The wastes include dredging spoils, industrial wastes, garbage and trash, large pieces of machinery and sewage sludge. Heavy metals are toxic to all forms of life. The containerized wastes will not remain as such for long periods however strong the containers may be. They pose a great potential danger to the marine environment (Cochin University Law Review, 1980, p.248). Petroleum pollutants in the ocean may occur at any concentration, ranging from bulk oil to oil at a very low level of concentration (FAO, 1970, pp.4-10). They may occur as floating material, an emulsion dispersed in sea water, in solution in water, or absorbed on sediments; they may also be taken up by marine organisms in the sea.

**2.5.4 Estuaries:** The inland and estuarine water resources comprise of rivers, canals, tanks, ponds, reservoirs, blackish water lakes and backwaters. The Department of Environment published, in 1972, the results of a river pollution survey in England and Wales. This classified rivers according to the quality of their waters. A Class I river is one either unpolluted or recovered from pollution. A Class II is one of doubtful quality and in need of improvement. A Class III stretch is one of poor quality requiring improvement as a matter of some urgency and a Class IV river is quite simply "grossly polluted" (Brooks Peter, 1974, p.30).

**2.5.5** The pollution caused by the discharge of partially treated or untreated wastes from the factories, sewage and excess chemicals from the agricultural operations finding its way into the water bodies are the main factors contributing to the water pollution. Estuarine environment serves as a nursery area for many prominent species. Disposal of wastes into the estuarine regions causes great damage to the species occupying these areas.

**2.6.0 Pollution due to Radiation:**

**2.6.1** Radiation sources in the environment are partly natural and partly artificial. Many natural radiation sources exist in the environment, most notably

radiation from the earth, from cosmic radiation, and from potassium-40 in human tissues. Terrestrial radiation in the United States varies from as little as 15 m rem/year in some coastal areas to over 100 m rem/year over parts of the eastern slope of the Rocky Mountains in Colorado (Hodges Laurent, 1977, p.330). Another important source of natural radiation is cosmic radiation. Cosmic rays are high-energy charged particles of extra terrestrial origin. A transcontinental jet flight at a height of 10 Km, results in an extra whole-body radiation dose of 1 m rem (Hodges Laurent, 1977, p.330). Pollution due to radiation could affect water bodies or land. Water pollution from radioactivity may result from the "fall out" from the testing of nuclear weapons and the dumping of radioactive wastes. The most hazardous radionuclides important in fall out are those listed in Table 2.6.1.

Table 2.6.1 (7)  
Radionuclides Important in Fall Out

Element	Isotope	Half-Life
Carbon	$^{14}\text{C}$	5760 years
Strontium	$^{89}\text{Sr}$	51 days
Strontium	$^{90}\text{Sr}$	28.9 years
Iodine	$^{131}\text{I}$	8.1 days
Cesium	$^{137}\text{Cs}$	30.2 years

Source: Hodges Laurent, "Environmental Pollution", Holt Rinehart and Winston, U.S.A., 1977, p.333.

Nuclear reactors produce large quantities of radioactive waste of great toxicity and persistence. Unlike many chemical toxins that can be neutralized, the hazard of radioactivity only disappears through natural decay, which may take hundreds, thousands, even millions of years (Lipschutz Ronnie, 1980, p.5). Wastes in liquid, solid or gaseous forms are produced in the mining, reactor operations, processing of reactor fuel and a great variety of related operations. The nuclear wastes contain elements so radioactive that a few millionths of a gram are enough to kill a human being (Dixit, D.K., 1983, pp.6-13). Wastes also result from the use of radioactive materials in industries, laboratories and other research institutions. Radioactive steam leaked from a nuclear power plant at Ontario in New York State, on Monday prompting officials to shut the plant down and declare a "site emergency" (The Hindu, January 25, 1982). The most dangerous atmospheric pollutants of all are present in radioactive fall out - the by-products of nuclear bomb explosions or of atomic power stations. The wastes constitute a considerable hazard and cannot be turned loose in the environment i.e. used as land fill or dumped into rivers or oceans. They must somehow be isolated from significant contact with the biosphere.

2.6.2 There are a number of other everyday sources of artificial radiation. Medical procedures are the major sources of artificial radiation exposures. Table 2.6.2 lists typical radiation doses received in the United States in 1970.

Table 2.6.2 (8)  
Typical Whole-body Doses of Radiation Received  
in the United States

	Millirems/Year
<hr style="border-top: 1px dashed black;"/>	
<u>Natural Sources</u>	
A. External to the body	
1. From Terrestrial Radiation (Earth, Building Materials)	44
2. From Cosmic Radiation	40
B. <u>Internal Sources</u>	
1. $^{40}\text{K}$ in human tissues	16
2. Other internal sources	2
Total from Natural Sources	102
 <u>Artificial Sources</u>	
A. Medicine	
1. Diagnostic X-rays	72
2. Radiopharmaceuticals	1
B. Radioactive fall out	4
C. Occupational Exposures (Nuclear Energy Industry, Laboratories)	0.8
D. Miscellaneous Sources (Television Tubes, Luminous Watch Dials, Nuclear Power Plants and other sources)	2
Total from Artificial Sources	182.8

Source: Hodges Laurent, "Environmental Pollution", Holt Rinehart and Winston, U.S.A., 1977, p.331.



Older type luminous watch faces using radium could deliver local doses of upto 2 m rem/h, but tritium ( $^3\text{H}$ ) is used today and the doses are only a negligible portion of artificial radiation (Hodges Laurent, 1977, p.332). X-rays from black-and-white television sets might contribute another millirem per year and large doses are occasionally reported from other sources - 10 m rem/h from houses built with radioactive stone, 100 m rem/h from bath tubs glazed with uranium pigments, etc.

## 2.7.0 Heavy Metal Pollution (Land Based):

2.7.1 Environmental pollution by heavy metals is an increasingly serious problem. However, it must be realized that toxic levels of metals may often occur naturally, without any human intervention. Thus, in some parts of Britain, lead occurs in the soil at such concentrations that many crops are unable to grow, and at slightly lower levels vegetable crops may take up the metal to such an extent that their consumption has to be forbidden. Copper, zinc, mercury and arsenic are also widely dispersed in nature. The bitter experience of Itai disease in Japan and alkyl mercury poisoning in Iraq has shown that "heavy metals" in the environment can have disastrous consequences on human health. Another case of Mercury poisoning occurred at Niigata, Japan, originating with the wastes from the

the acetaldehyde factory of the Showa Denko Company on the Agano river (Hodges Laurent, 1977, p.423). In the 1960s Sweden became concerned when it discovered that mercury poisoning had killed birds. Serious pollution has occurred from the presence of mercury in industrial effluents, particularly from the wood-pulp industry (Fimreite, N., 1970, pp.119-31). It has long been realized that lead and various lead compounds are poisonous to animals and humans. In addition to that occurring naturally, significant amounts of lead are released into the environment each year as by-products from various production processes. We find lead in batteries, paints, metal alloys and ceramics. Today, 20,000 tonnes of dissolved lead enter the oceans annually from rivers and a similar amount is introduced from the atmosphere by washout of aerosols originating from leaded automobile fuels (Polunin Nicholas, 1972, p.262). Recently much concern has been expressed about lead from motor car exhausts, derived from tetraethyl lead used as a petrol additive (Polunin Nicholas, 1972, p.341).

## 2.8.0 Thermal Pollution:

2.8.1           It has long been known that plants and animals thrive best in certain temperature ranges and that changes in the temperature of a body of water will

affect the types and numbers of organisms in the aquatic ecosystem. The use of river and lake waters in the United States for industrial cooling purposes can raise the temperature of the water enough to produce major changes in the ecosystems (Hodges Laurent, 1977, p.306). Thermal discharges to a waterway may thus favour the growth of blue-green algae over green algae, with resulting damage to the ecosystem. Rapid temperature changes produce "thermal shock" and sometimes almost immediate death.

2.8.2            Nuclear reactors are perhaps the worst offenders, as they have thermal efficiency of only 40 per cent that of power plants. As they use water as coolant, they heat very large amounts of water. The extinct oyster farm at Mahabalipuram, Tarapore and the Windowpane oyster at Vashi (New Bombay) are examples of ecological damage by thermal pollution (The Hindu, December 5, 1981, p.9).

#### 2.9.0        Sound Pollution:

2.9.1            Noise is one form of environmental pollution that disappears when the source is turned off. Residents of urban and semi-urban areas suffer from continued exposure to high intensity noise arising from vehicles, trains, factories, construction works, loudspeakers,

television and radio, church bells, fire works, bands, noisy appliances, etc. which are the most common sources of noise in towns and cities. Noises are also produced by brakes, cooling fans, heating and air-conditioning equipment. Noise annoys the residents, disturbs their sleep, interferes with their efficiency and power of concentration and may cause partial or complete deafness. Noise is measured by intensity in decibels in a range from barely audible to shatteringly loud. Table 2.9.1 shows weighted sound level and human response.

**Table 1.9.1 (9)**  
**Weighted Sound Level and Human Response**

<b>Sound Source</b>	<b>Decibels*</b>	<b>Response Criteria</b>
	- 150 -	
Carrier Deck Jet Operation	- 140 -	Painfully loud
	- 130 -	Limit Amplified Speech
Jet Take Off (200 ft.)		
Discotheque	- 120 -	
Auto Horn (3 ft.)		Maximum Vocal Effort
Riveting Machine	- 110 -	
Jet Take Off (2,000 ft.)		
Shout (0.5 ft.)	- 100 -	
New York City Subway Station		Very Annoying
Heavy Truck (50 ft.)	- 90 -	Hearing Damage (8 hours)
Pneumatic Drill (50 ft.)	- 80 -	Annoying
Freight Train (50 ft.)		
Free Way Traffic (50 ft.)	- 70 -	Telephone Use Difficult Intrusive
Air-Conditioning Unit (20 ft.)	- 60 -	
Light Auto Traffic (50 ft.)	- 50 -	Quiet
Living Room		
Bed Room	- 40 -	
Library		
Soft Whisper (15 ft.)	- 30 -	Very Quiet
Broadcasting Studio	- 20 -	
	- 10 -	Just Audible
	- 0 -	Threshold of Hearing

\* Weighted sound levels taken with a sound level meter and expressed as decibels on the scale approximating the frequency response of the human ear.

Source: Department of Transportation, as printed in "The New Encyclopaedia Britannica", Encyclopaedia Britannica, Inc., U.S.A., Volume 14, 1978, p. 749.

**2.10.0 Effect of Pollution on Man:**

**2.10.1** The various types of pollutions like air, water, heavy metals, radiation and sound pollution are hazards to man, animals, plants, monuments and climate. Such harmful consequences of pollution are described below.

**2.10.2 Effect of Air Pollution:** Industrial workers of Chembur and the Thane Belapur belt in Greater Bombay are chronic victims of polluted and smoggy air. So also are those working in the industrial belts of Uttar Pradesh, Madhya Pradesh and other states in South India. It is believed that "a wide range of environmental agents, even apart from infections, can participate in the causation and even more markedly in the aggravation of respiratory diseases" (Lee Douglas, 1972, pp.250-251). Continued exposure to air pollutants and their accumulation in the body - essentially a slow poisoning process - increases the incidences of such illnesses as bronchitis, emphysema and lung cancer (Julian Joseph, 1980, p.531). In London, a rise in the daily death rate of 10 per cent or more has been detected for sulphur dioxide concentrations of 0.5 ppm lasting for a full day. Table 2.10.2 below shows the observed relations between pollutant levels in the air and health effects.

Table 2.10.2 (10)

Observed Relations between Pollutant Levels and Health Effects

Pollutant	Sl. No.	Concentration Level Producing Adverse Health Effects	Adverse Health Effects
Sulphur Dioxide with Particulates	1.	80-100 $\mu\text{g}/\text{m}^3$ particulates (Annual Geometric Mean)	Increased death rates for persons over 50 years of age
	2.	0.046 ppm of $\text{SO}_2$ (Annual Mean) accompanied by particulate concentrations of 130 $\mu\text{g}/\text{m}^3$ .	Increased frequency and severity of respiratory diseases in school children
	3.	0.068 ppm of $\text{SO}_2$ (Annual Mean) accompanied by particulate concentrations of about 177 $\mu\text{g}/\text{m}^3$ .	Increased frequency and severity of respiratory diseases in school children
	4.	.037 - 0.092 ppm of $\text{SO}_2$ (Annual Mean) accompanied by particulates concentrations of 185 $\mu\text{g}/\text{m}^3$ .	Increased frequency of respiratory symptoms and lung diseases
	5.	0.05-0.09 ppm of $\text{SO}_2$ (24 hour average)	Increased illness rate of older persons with severe bronchitis
	6.	0.011 - 0.19 ppm of $\text{SO}_2$ (24 hour mean) with low particulate levels	Increased hospital admissions for respiratory diseases and absenteeism from work of older persons
	7.	300 $\mu\text{g}/\text{m}^3$ particulates for 24 hour accompanied by $\text{SO}_2$ concentrations of 630 $\mu\text{g}/\text{m}^3$ (0.22 ppm)	Chronic bronchitis patients suffering from acute worsening of symptoms.

Source: "Air Pollution", by Sainfeld, N. John, McGraw-Hill, New York, 1974, p.20.

**2.10.3 Effect of Water Pollution:** The rivers of Gujarat, Uttar Pradesh, West Bengal and South India have become carriers of industrial wastes. More than 50% of all tropical diseases are caused by the use of water containing pathogenic bacteria, gastro intestinal diseases - cholera, typhoid fever, amoebic and bacillary dysentery - alone affect 500 million people each year; and they carry away upto 5 million infant lives every year (Social Sciences, 1980). A survey report in the 'Indian Journal of Health' reveals that the river Ganges could not be considered safe for human use. According to a group of scientists who recently undertook ecological studies of the river water, found it contained germs of cholera, typhoid and gastro-enteritis. Some 8.6 million gallons of industrial effluents, besides 3 million gallons of community water, human and animal excreta, flow into Hooghly daily (Rale, J. Subhash, 1984, p.31).

**2.10.4 Effect of Radioactivity on man:** Radioactive isotopes can have effect not only on living organisms, but can also produce genetic mutations with disastrous consequences for the future generations (Dixit, D.K., 1983, pp.6-15). Minute amounts of radioactivity are capable of inducing cancer in the living, birth defects in the unborn, and mutagenic effects in the descendants of those exposed (Lipschutz, Rennie, 1980, p.25). Some data have



been accumulated over the years from human exposures to large radiation doses obtained accidentally or from nuclear explosions. Table 2.10.4 shows the approximate short term effects that might be experienced for whole body radiation exposures over a short period (Hodges Laurent, 1977, pp.328-329).

Table 2.10.4 (11)

Estimated Short-Term Effects of Single-Dose, Whole Body Radiation Exposures in Humans

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Less than 25 rads	No observable effect
About 25 rads	Threshold level for detectable effect
About 50 rads	Slight temporary blood changes
About 100 rads	Nausea, fatigue, vomiting
200 to 250 rads	Fatality possible, though recovery is more likely
About 500 rads	Perhaps one-half the victims would die
About 1000 rads	All the victims would die

---

Source: Brannigan, F.L., "Radiation in Perspective", Nuclear Safety, 5:226-228 (1984).

Exposure to a few hundred rads lead to acute radiation illness: nausea, fatigue and vomiting within a few hours and for a day or two, a decrease in red and white blood cells and blood platelets for a few weeks, then anaemia,

susceptibility to bacterial infection and haemorrhaging for some period, often followed by death (Hodges Laurent, 1977, p.329).

**2.10.5 Effect of Metal Pollution and Carcinogens: Lead** has many adverse biological effects. The most severe clinical form of lead poisoning is brain damage, which produces clumsiness, subtle changes in mental attitude, sluggishness, poor memory, inability to concentrate, restlessness and hyper irritability (Hodges Laurent, 1977, p.421). Dr. Herbert Needleman of the Children's Hospital, Pittsburg, has demonstrated that "children with elevated blood lead levels accumulated in their baby teeth exhibited more behavioural problems, lower IQs and decreased ability to concentrate" (Business India, 1984, p.107). Mercury accumulation in the body affects the nervous system and causes brain damage. Inhalation of the smoke from 20 cigarettes might bring 2 to 4  $\mu$ g. of cadmium into the lungs. One serious epidemic of cadmium poisoning in Japan led to painful bone ailments and over 100 deaths (Hodges Laurent, 1977, p.430). Beryllium is a well-known carcinogen and "there is also evidence that occupationally exposed workers have greatly increased incidences of cancers of the lung, liver, bileduct and gall bladder (Hodges Laurent, 1977, p.427). Selenium intoxication

in humans results in discolored and decayed teeth, yellow skin colour, skin eruptions, chronic arthritis, edema, gastro intestinal disorders and loss of hair and nails. Tin can accumulate in the human heart. Chromium is toxic to humans, produces lung tumours when inhaled and is a potent sensitiser of skin. Silver in amounts greater than about one gram can cause an unsightly permanent blue-gray discolouration of skin, eyes and mucous membranes.

**2.10.6 Effect of Carcinogens:** As much as 80% of cancers are now thought to be induced by human contact with environmental carcinogens in the water, air, food and some consumer products (Schneilberg Allan, 1980, p.30). Cancer is known to be environmentally related, because the number of cases of cancer vary markedly over time and between different geographical locations. The World Health Organisation has estimated that 80 to 90 per cent of all human cancers are environmentally related or induced (Hodges Laurent, 1973, p.11). One study found strong correlations as the following:

- 1) High rates of bladder cancer near factories manufacturing dyes and pigments drugs, perfumes, cosmetics and toiletries.

- 2) High rates of lung cancer near factories manufacturing industrial gases, pharmaceuticals, soaps and detergents, paints, pigments and synthetic rubber.
- 3) High rates of liver cancer near factories manufacturing synthetic rubber, soaps and detergents, cosmetics, printing inks and certain organic chemicals (Hoover Robert, 1975, pp.196-207).

Table 2.10.6 provides a partial list of substances (suspected Carcinogens) alongwith their uses and estimates of the number of workers, potentially at risk due to routine exposure to these substances at their places of work.

**Table 2.10.6 (12)**  
**Suspected Carcinogens**

<b>Substances</b>	<b>Uses</b>	<b>Estimated No. of workers potentially at risk</b>
<b>Chloroprene</b>	<b>Production of synthetic rubber</b>	<b>2,500</b>
<b>Trichloroethylene</b>	<b>Industrial solvent, extraction of caffeine from coffee, anaesthetic</b>	<b>200,000</b>
<b>Ethylene di bromide</b>	<b>Leaded gas additive, dyes and pharmaceuticals, some pesticides</b>	<b>650,000</b>
<b>Coke oven emissions</b>	<b>Smelting</b>	<b>5,000</b>
<b>Asbestos</b>	<b>Brakes and clutch assemblies</b>	<b>900,000</b>
<b>Beryllium</b>	<b>Metal alloys, rocket fuel</b>	<b>30,000</b>
<b>Chromatic compounds</b>	<b>Paints and anticorrosives</b>	<b>450,000</b>
<b>Hexa methyl phosphoric triamide (HMPTA)</b>	<b>Solvent used in research labs</b>	<b>5,000</b>
<b>Poly chlorinated biphenyls (PCB)</b>	<b>Coolants, insulators, hydraulic fluids, pesticides, ink, etc.</b>	<b>12,000</b>
<b>4, 4-Di amino diphenyl methane (DDM)</b>	<b>Poly urethane production</b>	<b>2,500</b>
<b>Chloroform</b>	<b>Production of fluoro carbons, dyes, drugs, pesticides contained in cough and cold preparations, laboratory solvents.</b>	<b>40,000</b>

**Source:** Council of Environmental Quality, 7th Annual Report (1976), Washington, D.C., Government Printing Office as printed in Environmental Economics, by Seneca, J. Joseph, 1979, p.191.

**2.10.7 Effect of D.D.T.:** D.D.T. has accumulated in the body fat of humans in every part of the globe, from Alaskan eskimo to city dwellers of New Delhi (Meadows, 1972, p.92). D.D.T., which is somewhat capable of evaporating into the atmosphere, was being carried around the globe and was entering food chains all over the earth (Nebel Bernard, 1981, p.375). Studies have shown that the daily content of D.D.T. and D.D.E. in meat eaten by Americans might be about 0.04 to 0.5 mg, and that concentrations of D.D.T. and derived materials in body fat might be 5 to 12 ppm (Hayes, W.J., 1966, pp.314-342). Human illness and death have resulted from improper or accidental exposure to large amounts of pesticides, particularly the toxic organophosphates.

**2.10.8 Effect of noise pollution:** From the medical point of view excessive noise is a health hazard too. Workers employed in factories, where high intensity noise is produced, are subject to hearing damage. Human beings are also clearly annoyed by noise, which can interfere with their relaxation and sleep. Noise can interfere with speech and work. Experiments have clearly established that noise makes it harder to perform simple vigilance tasks, such as watching for the appearance of three successive odd digits presented in sequence on a screen (Carpenter, A., 1963, pp.297-306). Other physiological effects include dilation of the pupils,

peeling of the skin, tensing of the voluntary muscles, diminution of gastric secretion, increase in diastolic blood pressure, and the sudden injection of adrenalin into the blood stream, which increases neuromuscular tension, nervousness, irritability and anxiety (Hodges Laurent, 1977, p.152).

#### 2.11.0 Effect of Pollution on Animals:

2.11.1           The major pollutants which affect animals are fluorine and sulphur dioxide. The most widely publicized animal problem is damage from grazing in areas where grasses are contaminated by fluoride dusts or have absorbed fluoride compounds from the atmosphere (Faith, W.L., 1972, p.14). Such toxic compounds may be absorbed into the plant tissues or may remain as a surface contaminant of the plants. The high rate of abortion and infertility seen in cows are because of the problem of pollution from fluorine and fluoride. Fluorosis in animals has been attributed to their ingestion of vegetation covered with a fluoride-containing particulate matter (Wark Kenneth and Warner Cecil, 1976, p.19). The toxicity of the fluoride particulates depends, of course, on their solubility, sodium fluoride being much more toxic than calcium fluoride or rock phosphate (Faith, W.L., 1972, p.14). Safe levels of dietary fluoride for various types of livestock are shown in Table 2.11.1(a).

**Table 2.11.1(a) (13)****Safe Levels of Fluoride in Daily Total Ration of Livestock**

<b>Species</b>	<b>Soluble Fluoride</b>	<b>Rock Phosphate or Phosphatic Limestone</b>
Dairy cow	30 - 50 ppm F	60 - 100 ppm F
Beef cow	40 - 50	65 - 100
Sheep	70 - 100	100 - 200
Swine	70 - 100	100 - 200
Chicken	150 - 300	300 - 400
Turkey	300 - 400	---

**Source:** National Academy of Sciences, National Research Council, Publication No.381, 1955. (As quoted by Faith, W.L., 1972, p.14).

Sewage, toxic chemicals and disease organisms can also make water unfit for use by farm animals. Some types of pollution are known to affect animals at levels that do not appear to affect humans (Hedges Laurent, 1977, p.10). Table 2.11.1(b) shows the fluoride tolerance of different species of animals.



**Table 2.11.1(b) (14)****Fluoride Tolerance of Animals (ppm. Not in Action,  
DFY )**

<b>Species</b>	<b>Breeding or Lactating Animals ppm.</b>	<b>Finishing Animals to be Sold for Slaughter with Average Feeding ppm.</b>
Dairy, beef heifers	30	100
Dairy cows	30	100
Beef cows	40	100
Sheep	50	160
Chicken	--	150

(a) Data based on soluble fluoride; increased values for insoluble fluoride compounds.

**Source:** Fundamental of Air Pollution, by Stern, Wöhlers, Boubel and Lowry, Academic Press, London, 1972, p.192.

An accumulation of fluoride in the bone structure leads to weight loss and lameness. Fluoride content of the bone increases with dosage despite excretion in urine and faeces. Secondary symptoms include reduced lactation, dry skin and rough hair coat. Table 2.11.1(c) shows the pathological effects of fluorine.

**Table 2.11.1(g) (15)**  
**Pathological Effects of Fluorine**

<b>Gross Pathology</b>		<b>Histopathology</b>	
<b>System</b>	<b>Effect</b>	<b>Organ or tissue</b>	<b>Structural Effects</b>
<b><u>Fluorine</u></b>			
<b>Dentition</b>	<b>Enamel hypoplasia Dentine hypoplasia mottling Dentomalacia Dentalgia</b>	<b>Teeth</b>	<b>Defective calcification  Irregular calcification</b>
<b>Skelton</b>	<b>Exostosis  Ankylosis</b>	<b>Bone</b>	<b>Osteoblastic activity, periosteal calcification  Osteoclastic removal of bone of narrow cavity</b>
<b>Soft tissues</b>	<b>Chondrodynia Osteomalacia Emacipation Inanition Cachexia</b>	<b>Kidney Thyroid</b>	
<b>Gastro intestinal</b>	<b>No diarrhoea</b>		

**Source:** Air Pollution handbook, edited by Megil Holden & Askley, McGraw-Hill Book Company, New York, 1956, p. 8.

Experiments conducted at the department of Zoology, S.V. University, clearly shows that the fresh water mussels and the fresh water snails have a very high tolerance for heavy metals such as cadmium, zinc, copper, mercury etc. present in the medium (The Hindu, 1981, December 21, p.8). It is quite likely that these animals accumulate these heavy metals in their bodies and the consumption of these animals by humans would release these heavy metals into the human system leading to the reported Neurological diseases. Pollution of the marine environment poses a dangerous threat not to marine life alone, but to the plant and animals species in the whole planet. Bays, estuaries and coastal lagoons, the nurseries for the eggs and very young fish are completely affected by pollution (Cochin University Law Review, 1980, p.245). Several research groups in the U.K. believe that a relatively small oil slick at the wrong time and in the wrong place can result in large scale mortalities to important breeding populations which would have serious long term implications for the survival of certain species. Embryos of the toad-fish *Opsanus tau* survived for one day when 10 ml/l of crude oil was added or for ten days at 1 ml/l (Smith, A. Nelson, 1972, p.112). Concerning the toxic effects of pollutants on marine organisms Halstead writes: "thousands of halibut, croaker, sea-bass,

sole, sanddabs and other shore fishes, in the vicinity of sewage outfalls, have had an alarmingly high incidence of cancerous growths, skin ulcers, malformation, emasculation and genetic changes" (Halstead, B.W., 1970, p.21).

2.11.2 D.D.T. present throughout the ecosystem threatens wild life with population crashes and local extinction (Yejana, 1978, p.10). D.D.T. contamination inhibits avian reproduction by causing the birds to lay abnormally thin shelled eggs, which break prematurely in the nest and therefore do not produce chicks (Peakall, D.B., 1972, pp.72-78). In the 1950s scientists began to observe drastic declines in populations of fish-eating birds, such as the bald eagle, the osprey, the cormorant and the brown pelican (Nebel Bernard, 1981, p.375). Similarly, populations of robins and numerous insect-eating song birds were observed to be declining markedly.

#### 2.12.0 Effect of Pollution on Plants:

2.12.1 Agriculture and horticulture are both affected by pollution. There have been countless cases of vegetation - agricultural crops, ornamental plants and forest species - being severely destroyed or damaged by air pollution. The most frequently encountered air contaminants toxic to

vegetation are sulphur dioxide, hydrogen fluoride, chlorine, hydrogen chloride, nitrogen oxides, hydrogen sulphide, ammonia, hydrogen cyanide, mercuric vapour, ethylene, sprays of weed killers and constituents of photo chemical smog (Faith, W.L., 1972, p.11). Table 2.12.1 shows the pollutant effects on vegetation:

**Table 2.12.1 (16)**  
**Pollutant Effects on Vegetation**

Pollutant	Symptoms	Maturity of leaf affected	Part of leaf affected	Injury threshold	
				ppm.	Vol. Sustained
Sulphur dioxide	Bleached spots, bleached areas between veins, chlorosis; insect injury winter and drought conditions may show similar markings	Middle aged most sensitive; oldest least sensitive	Mesophyll cells	0.03	8 hrs.
Hydrogen fluoride	Tip and margin burn drawing leaf abscission, narrow brown red band separates necrotic from green tissue	Youngest leaves most sensitive	Epidermis and mesophyll cells	0.1 (ppb)	5 weeks
Chlorine	Bleaching between veins, tip and margin burn, leaf abscission	Mature leaf most sensitive	Epidermis and mesophyll cells	0.10	2 hrs.
Ammonia	Cooked green appearance becoming brown or green on drying, overall blackening on some species	Mature leaf most sensitive	Complete tissue	20	4 hrs.
Hydrogen chloride	Acid type necrotic lesion, tip burn on fir needles? leaf margin necrosis on broad leaves	Oldest leaves most sensitive	Epidermis & mesophyll cells	5.10	2 hrs.
Mercury	Chlorosis and abscission, brown spotting yellowing of veins	Oldest leaves most sensitive	Epidermis and mesophyll cells	1	1-2 days
Sulphuric acid	Necrotic spots on upper surface similar to caustic or acidic compounds high humidity needed	All	All	--	--

Source: Fundamentals of Air Pollution, edited by Stern, Wohlers, Boubel and Lowry, pp.116-117.

1972

**2.12.2**            **Air pollution is also responsible for a general reduction in plant growth which can occur without other conspicuous signs of damage or abnormality. Field experiments at River side, California, showed that yields of sweet corn were reduced by 72 per cent, Alfalfa 38 per cent, radishes 38 per cent, grapes 60 per cent, naval oranges 50 per cent and lemon 30 per cent as compared to similar plants grown in clean filtered air (Nebel Bernard, 1981, p.331). Nevertheless Hull and Went have reported that sublethal fumigations with Los Angeles smog have retarded the growth of alfalfa, sugar beet, endive, oats, spinach and tomato plants (Faith, W.L., 1972, p.12). Air pollution has forced the complete abandonment of citrus growing in certain areas of California and vegetable growing in certain areas of New Jersey - areas that were formerly among the most productive regions in the country (Nebel Bernard, 1981, p.331). The nature of the damage varies with the toxicant, but is usually some form of chlorotic marking, banding or silvering or bronzing of the underside of the leaf (Faith, W.L., 1972, p.12). Even when pollution levels are not high enough to produce noticeable injury, retardation of growth may occur. Because some plants are likely to be more sensitive than others to the pollutant whether it be an air or a water pollutant or radiation.**

There may be complex changes in the plant ecosystem with effects on one species leading to effects on others (Hedges Laurent, 1977, p.9). The three main contaminants of plants are sulphur dioxide, fluorine compounds and smog. Sulphur dioxide is readily absorbed through the stomata into the mesophyll of leaves. Many species of plants are susceptible to injury by this gas at concentrations above 0.3 ppm if exposed for several hours at optimum conditions of light, temperature, soil moisture, relative humidity and other growth conditions (Brooks Peter, 1974, pp.128-130). Sulphuric acids, too, are literally held in contact with vegetation by the agency of sooty deposits. Hydrogen fluoride and silicon tetra fluoride are toxic to some plants in concentrations as low as 0.1 ppm. Gladioli, apricots, prunes and peaches are very susceptible to hydrogen fluoride in concentrations as low as 0.02 - 0.05 ppm (Brooks Peter, 1974, p.130). Smog has the characteristic of concentrating pollution in relatively small areas and produces the general effect of smoky air. Conifers have sunken stomata which act as effective traps for impurities in the air and these species are always the first to succumb in a smoky atmosphere. Ozone injury is seen as regular white or brown staining, generally on the upper surfaces of grape, citrus and other broad leafed plants. Toxic chemicals present in the soil



are absorbed by plants. Such substances may enter the soil from the atmosphere, contaminated irrigation water or from pesticides, fertilisers and sewage sludge applied to agricultural land.

2.12.3            A study was conducted in the Eloor industrial belt in 1974 by Dr. N.S. Mony of the Vallayam Agricultural College to find out the effects of two gases on paddy plants and to verify whether charring of paddy crops happened from chlorine of T.C.C. or  $SO_2$  of F.A.C.T. Both the companies were requested by Dr. Mony to measure the concentration of these gases in the atmosphere and to conduct tests on paddy plants. Table 2.12.3(a) gives the results of the experiments on concentrations of different pollutants as reported by F.A.C.T and T.C.C. Later Dr. N.S. Mony carried out experiments at F.A.C.T Research station. Plastic cages were made air tight and this was placed above the plants in the paddy field. Chlorine and sulphur dioxide were sent individually and jointly in different experiments and at different concentrations.

Table 2.12.3(a) (17)Results of the Experiment on Concentrations of Different Pollutants as Reported by FACT & T.C.C.


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**FACT REPORT**

**Experimental Results of Concentrations of Different Pollutants**

	On 21-4-1974	On 23-3-1974
Dust	0.004 ppm	.009 ppm
CO <sub>2</sub>	0.05 ppm	.04 ppm
H <sub>2</sub> S	nil	nil
HCl	nil	nil
SO <sub>2</sub>	0.0013 ppm	.0022 ppm
SO <sub>2</sub>	0.001 ppm	nil
Cl <sub>2</sub>	463 ppm	331 ppm

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**T.C.C. REPORTS****Average Concentrations of Various Gases in January and February**


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	January	February
Cl <sub>2</sub>	0.07 ppm	Nil
SO <sub>2</sub>	0.07 ppm	0.4 ppm
HCl	Nil	Nil
NH <sub>3</sub>	0.18 ppm	4 mg/m <sup>3</sup>
Dust	7 mg/m <sup>3</sup>	110 mg/m <sup>3</sup>

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**Source:** Interim Report on Paddy Charring Event at Kloor, by Mony, N.S., Vellayani Agricultural College, 1972.

**Table 2.12.1(b) (18)**  
**Observed Effects of Sulphur Dioxide and Chlorine**  
**on Plants**

<b>Treatment gas</b>	<b>ppm (Volume)</b>	<b>Total No. of plants</b>	<b>No. of affected plants</b>	<b>Per-cent-age</b>	<b>Remarks</b>
<b>SO<sub>2</sub></b>	<b>20</b>	<b>73</b>	<b>Nil</b>	<b>0</b>	<b>-</b>
<b>Cl<sub>2</sub></b>	<b>20</b>	<b>65</b>	<b>21</b>	<b>32</b>	<b>Plant completely burnt leaf tips of all the plants appear to be burnt</b>
<b>Cl<sub>2</sub> + SO<sub>2</sub></b>	<b>20+ 20</b>	<b>50</b>	<b>21</b>	<b>42</b>	<b>4 plants are completely burnt leaf tips of all plants are burnt</b>
<b>HCl</b>	<b>20</b>	<b>57</b>	<b>8</b>	<b>14</b>	<b>Leaf tips burnt</b>
<b>SO<sub>2</sub></b>	<b>50</b>	<b>57</b>	<b>3</b>	<b>5</b>	<b>"</b>
<b>Cl<sub>2</sub></b>	<b>50</b>	<b>53</b>	<b>34</b>	<b>64</b>	<b>Leaf tips burnt and leaves turned dark brown</b>

**Source:** Interim Report on Paddy Charring Event at Elcor, by Mony, N.S., Vallayani Agricultural College, 1972.

2.12.4 Cement-kiln dust in combination with mist or tight rain has been observed to form a crust on the leaves of plants, resulting in plant damage and magnesium oxide falling on agricultural soils has resulted in poor plant growth (Wark Kenneth, 1976, pp.18-19).

2.13.0 Effect on Materials:

2.13.1 Priceless old world sculptures and architectural monuments are being slowly destroyed by acid content in the air. Pollutants can accelerate the deterioration of materials and construction. The burning of high sulphur coal and oil generate sulphur oxides that, when deposited on stone, combine with rainwater to form sulphuric acid. Marble, the most valuable building stone and sculpting material, is sensitive to these acids, and is easily disintegrated by the effect of sulphuric acid. Taj Mahal is a valuable monument that is being affected by pollution. The marble has lost its enamel like radiance that once distinguished the Taj from other monuments. While most of it is dull but still whitish, pollutants have lodged in the moisture trapped between the marbles, thereby producing an acidic reaction which has given some of the marble a grey and brownish tinge (Lila, R.M., 1981).

**2.14.0 Effect of Pollution on Climate:**

**2.14.1**           **Pollution in the atmosphere can have significant effects on climate. Conversion of forests to pasture land causes increased soil erosion by water. Similarly, conversion of grasslands to agricultural crop production has led to erosion, as in the dust bowl days of the central United States in the 1930s (Hodges Laurent, 1977, p.89).**

**2.15.0 Conclusion:**

**The main resolution passed at the 1972 United Nations Conference on the 'Human Environment' held at Stockholm said:**

**"A point has been reached when we must shape our actions with a more prudent care for their environmental consequences. Through ignorance or indifference, we can do massive and irreversible harm to the earthly environment on which our life and well being depend".**

**As a solution for environmental problems an expert committee of scientists from the 'Committee on Science and Technology in Developing Countries' which recently toured several Asian countries has recommended that advancing countries should aim at:**

- 1) Achieving "micro-level growth through projects which are environmentally sound".
- 2) Creating public awareness to environmental issues
- 3) Specific attention to be paid to formal environmental education and public education
- 4) Enactment of environmental legislations and make them more stringent to ensure that the quality of the environment is enhanced (The Hindu, May 18, 1985, p.8).

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## CHAPTER - III

### 3.0.0 PRESSURE GROUPS FOR ENVIRONMENTAL PROTECTION

#### 3.1.0 Introduction

3.1.1           The general deterioration of the natural and man-made environment is a source of grave concern all over the world. Development of public consciousness and public reactions to various environmental issues - international, national, regional and even at local levels - is necessary in order to check further deterioration of the environment. This public consciousness is likely to lead to popular movements for ensuring better environmental standards especially by the initiative of intellectuals, social workers and laymen. Awareness of the need to breathe pure air and drink pure water and to preserve the animal kingdom and the world of vegetation and to safeguard the Earth's natural resources from destruction paved the way for the development of the environmental protection movement. Environmental groups have had an increasing impact on business during the past decade. More people have become aware of the country's pollution problems and more comprehensive and

stricter environmental legislations have been passed. Private citizens, civic organizations and communities everywhere have organized to prevent environmental deterioration and to protest against industrial pollution. Various labels like 'Friends of the Trees', 'Friends of the Earth', 'The Philippine Movement for Environmental Protection', 'The Environmental Defense Fund', 'Save Bombay Committee', 'Madras Environmental Group', 'Chipko Movement', 'Heritage of India Society' etc. have become major titles that one, on reading the daily newspapers begins to wonder what all these terms and titles mean and what the roles, functions, contributions and achievement of these groups<sup>are</sup> in the context of environmental degradation including industrial pollution?

**3.1.2 Background of major environmental groups -** origin, development, achievements, role and functions of these groups working for environmental protection is described in detail in this chapter. Such major environmental protection movements in United States of America, United Kingdom and other Asian countries are described in detail.

### **3.2.0 Environment and Environmental Consciousness**

**3.2.1** To Allan Schnaiberg, "The simplest form of the environment is the universe of biotic and other physical material as organised into dynamic systems. These systems



are ecological systems or ecosystems which represent the integration of living and non-living elements in the environment" (Schnaiberg Allan, 1980, p.9). Hence the emphasis is on living and non-living elements and their integration.

**3.2.2 Societal meanings of 'Environment':** During the past decade there has been conflicting views among environmentalists concerning the meaning of "Environment". Environmental groups, more so individuals in organizations, tended to stress different issues. At a very abstract level two views can be seen in recent writings (Schnaiberg <sup>Schnaiberg</sup> Dunlap, R.H. and Galton, W.R., <sup>Allan</sup> 1978, p.9). The first is environment as a home for mankind and the second notion as that of sustenance base for society (Schnaiberg Allan, 1980, pp.10-11). In this view, environment is seen as the focus of all material support of human kind. Some groups stressed exclusively on wilderness preservation and protection of wild lands from development; others, many with a scientific emphasis, were concerned more with ecological disruption or issues of environmental health. Environmentalists in government agencies tended to consider environmental resource use in economic terms. A cultural, aesthetic, scientific or economic background and a related conceptual framework or methodology often determines environmentalists' perspective and commitment (Petulia Joseph, 1980, p.9).

**3.2.3** History tells us that environmental consciousness in India began in ancient times and can be exemplified in our culture and tradition of worshipping mountains, rivers, trees and animals as Gods and Goddesses. The pre-Vedic man indentified at least four major components: Mitra - the Sun; Agni - the Fire; Prithvi - the Earth and Dyu - the Sky - that sustained life and, therefore, worshipped them as deities. As the culture advanced to the Vedic age, Vedic man expressed importance of environment by singing hymns in praise. For example, Rig Veda I-48-5 described Ushas or the Dawn "Like a noble lady Ushas comes tending everything carefully. Rousing all life she stirs every footed creature and makes the birds fly" (Dash Bandhu and Ramenathan, N.L., 1982, p.293).

**3.2.4** Manu, the ancient law-giver, has prescribed punishment for cutting trees and has also pointed out the possible salvation for those who have planted trees. Kautilya (300 B.C.) recognised five types of forests under the charge of forest superintendents and also he referred to the protected forests where the wild life was conserved. Emperor Asoka (242 B.C.) recognised the importance of balance of nature as well as the aesthetic and cultural values of environment and declared that wild life should be preserved. He insisted that certain species of animals,

birds, fishes and insects should not be killed at all.

Akbar (1526 A.D.) and some of the other Mughal rulers were keen in protecting nature and had even introduced exotic trees into this country to organise parks, gardens and avenues.

3.2.5 With the passage of time man realised that environmental resources were necessary both for his survival as well as for better living. So man used environmental resources without any concern for the ecosystem. The indiscriminate use of the environment led to serious ecological imbalances. For example, cutting down of trees in Himalayas led to landslides, floods and extinction of many species of flora and fauna. The release of smoke and gases from chimneys polluted the atmosphere, and the disposal of untreated industrial wastes and city garbages into oceans threatened marine life. The effects, in most cases, were not local, but global. Thus the traditionally fostered environmental consciousness in India began to decline with the increase in population and problems of food, housing and raw materials. The environmental deterioration in India began as "early as 14th Century" (Gopalan, U.K., 1982).

### **3.3.0 Global and National Efforts for Environmental Protection:**

**3.3.1** On a global scale, the efforts to protect the environment started in the mid 1900s. The International Union for the Conservation of Nature and Natural Resources (IUCNR) was established in 1948 to promote scientifically-based action directed towards the protection and sustainable use of living material resources. IUCNR is an independent, international, non-governmental organization with 470 members from 109 nations, including 54 sovereign States, 116 governmental agencies and over 300 non-governmental organizations (Desh Bandhu and Ramanathan, N.L., 1982, p.107). IUCNR has six commissions: Ecology, Education, Environmental Planning, Species Survival, Environmental Policy, Law and Administration and National Parks and Protected Areas. IUCNR carries out a substantial programme of monitoring, planning, promoting and offering assistance to governments, inter-governmental bodies and non-governmental organizations. These programmes are based upon the authoritative information and advice provided by IUCNR members and commissions with whom they and the IUCNR Secretariat are in contact (IUCNR, 1980, p.1). The Commission on Education of IUCNR was founded in 1949 and during the nearly years of the Commission's existence

activities centered around the elaboration of definition and of resolutions for all different fields of environmental education and the preparation of educational materials for schools and youth groups, such as illustrated brochures, film strips and a guide to conservation. After 1960 the Commission began to encourage the creation of regional committees and the organization of meetings and workshops like, the Symposium on Conservation Education at University Level, held in Lucerne in 1966, the International working meeting on Environmental Education in the School Curriculum, held in Nevada in 1970, the First European Working Conference on Environmental Conservation Education in Ruschlikon, Switzerland in 1979 and the Workshop on Environmental Education Methodology in East Africa, held in Mombasa in 1974. Since 1975 the Commission has co-operated fully with the UNESCO-UNEP Environmental Education Programme established in 1975 and was therefore closely involved in the International Workshop on Environmental Education held in Belgrade in 1975, as well as in the Intergovernmental Conference on Environmental Education held in Tbilisi, USSR in 1977. The Commission has also encouraged decentralisation through the formation of regional or national committees. The following two regional committees were in existence since the early days of the Commission: the North-West Europe and the

East Europe Committees. In addition, Committees have been or are being established in Argentina, Australia, Canada, China, Czechoslovakia, India, Pakistan, Poland and the United States. In March 1980 a document was published by the IUCN in co-operation with UNEP and the World Wildlife Fund namely the World Conservation Strategy. Section 13 of the Strategy is entitled "Building support for conservation: participation and education" (Desh Bandhu and Ramanathan, M.L., 1982, p.107).

3.3.2 International efforts to study and combat environmental pollution started in the early 1970s, most of them under the auspices of United Nations Organisation (Clayton Jensen, 1975, pp.432-438). In 1963, the World Meteorological Organization launched a World Weather Watch and in 1970 expanded its work to include concern about air pollution (Carl Wallen, 1975, pp.30-34).

3.3.3 The International Council of Scientific Union (ICSU) whose Secretariat is located in Paris was established in 1931. ICSU is an international non-governmental scientific organisation composed of 18 International Scientific Unions, 64 national members, 17 scientific associates and 4 National Associates. The principal objective of ICSU is to encourage international scientific

activity for the benefit of mankind. The 'International Geophysical Year' and the 'International Biological Programme' are the best-known examples. The various members of the ICSU organize conferences, congresses, symposia, summer schools and meeting of experts in many parts of the world. A wide range of publication is produced, including newsletters, handbooks, proceedings of meetings, congresses and symposia, professional scientific journals and data standards.

3.3.4           The Committee on Science and Technology in Developing Countries (COSTED) was established in 1966 and this Committee has been extremely active since its creation in a number of fields touching the scientific needs of developing countries, including that of environmental education. It organised a series of regional meetings in 1975 to discuss the theme 'Resource and Environment: the Role of Science Education'. These meetings were held in Ghana, in Malaysia and in Argentina.

3.3.5           The environment era, so to say, began since 1972, for there was considerable development of activities recognised internationally as environmental education. In 1972 the United Nations convened the International Conference on the Human Environment in Stockholm, Sweden.

Fourteen countries were represented at the Conference, which resolved to set up a United Nation's Environmental Organisation. The United Nation's Environment Programme was organised with headquarters in Nairobi, Kenya. The Conference was a historic meeting in the sense that it resulted in the establishment of the United International Environmental Education Programme (IIEP). In 1975 IIEP organised the Belgrade International Workshop on Environmental Education. One of the inputs for the workshop was the preliminary world survey of environmental education needs and priorities aimed at providing information permitting the formulation of effective strategies for action at the global, regional and national levels. The Belgrade workshop was followed by a series of regional meetings in Africa, the Arab States, Europe, North America and Latin America. The Asian Regional Meeting was held in Bangkok in November 1976. The Regional meeting was followed by the Inter-governmental Conference on Environmental Education which was held in the City of Tbilisi, Georgia, USSR in October 1977 and which marked the culmination of the first phase of the Environmental Education programme. The Tbilisi Conference was followed by another activity in the Asian Region namely the Workshop on 'Environmental Education' which was held in Bangkok in September 1980.



**3.3.6** India got sensitised to environmental needs through the efforts of International Union for Conservation of Nature and Natural Resources (IUCNR) which held its session in New Delhi in 1969. Indian participation in the 'International Biological Programme' and 'Man and Biosphere Programme' has enhanced the growing environmental awareness especially among the academic and scientific community. The historical United Nation's Conference at Stockholm in June 1972 and the subsequent follow-up by the United Nation's Environmental Programme (UNEP) and other agencies have created greater awareness and involvement of more and more people in all aspects of human environment. Moreover, protection of environment is a matter of national concern and this is reflected in the Directive Principles of State Policy of our Constitution. Recognising the need for a major coordinating body on environment related action, the Government of India set up a full-fledged "Department of Environment". An environmental forum of parliamentarians has also been constituted to focus attention on environmental issues. Various functional departments of the Central Government have initiated action to have advisory committees on environment. At the State level committees have been constituted to advise on specific matters concerning environmental problems.

We have also introduced courses in environmental education in a number of institutions of higher learning in the country. Useful research in environmental sciences is being supported by the Department of Environment, the University Grants Commission and other funding bodies. Besides, the Sixth Five Year Plan gives explicit recognition to the role of non-government organisations in environmental protection (Desh Bandhu and Ramnathan, N.L., 1982, p.12).

#### 3.4.0 Background of the Environmental Movement

3.4.1 Concern about dwindling natural resources kindled the development of the American Conservation Movement. The history of this movement can be divided into three periods (Stapp William, 1974, pp.42-49; Swan Malcolm, 1978, pp.4-20; Kirk John, 1977, pp.29-36) namely:

- a) The awareness period (1864-1900): This period was influenced by the writings of George Perkins March, John Muir, John Wesley Powell and John Burroughs. John Burroughs wrote twenty books on nature during this period to create an awareness on the need for appreciation and conservation of natural resources. The objectives of these writings and teachings of this period was centred on the replacement of

resource exploitation and on favouring the conservation of natural resources.

- b) The preservation period (1901-1910): From 1901 until approximately 1910, the American Conservation Movement was dominated by the thinking and influence of President Theodore Roosevelt. He increased by at least five times, the amount of federally protected land, established the first wildlife sanctuaries and created America's first conservation management agency, the US Forest Service.
- c) The management period (1911 onwards): The management period extends from 1911 to the present day. It has been marked by the development of government resource agencies such as the U.S. Soil Conservation Service, the U.S. Bureau of Land Management and the U.S. Fish and Wildlife Service.

3.4.2           The modern environmental movement can be traced to the influential writings on environmental problems and which first became front page news in the late 1960s and early 1970s. Similar to the French revolution and the Consumer movement, the environmental movement also originated as a result of many authors who expressed their strong reactions to environmental degradation through their writings.

**3.4.3 Rachel Carson's book "Silent Spring" introduced a whole generation to the disadvantages of the highly toxic chemicals in air, water and soil (Carson Rachel, 1962)**

**Rachel Carson was a perceptive ecologist who worked for the U.S. Bureau of Fisheries, later called "Fish And Wild Life Service". Her interest in the pesticide D.D.T. began as early as 1945, but did not provoke her to action until 1958, when a friend, Olga Owens Huckins sent her a copy of a letter she placed in the Boston Herald about the lethal effect which a D.D.T. spraying over Duxbury, Massachusetts, had on song birds. Concern revived, Carson tried to interest others in writing about the problem, and she began work on it herself. She relied mainly on evidence that the food chain processes - from water to plankton to fish to man - are susceptible to D.D.T. (pesticide materials) concentration. Her most famous example came from clear lake, California, where heavy concentrations of D.D.T. had fatal effects on the Western Grebe (Petulla Joseph, 1980, p.67). She repeatedly made the points that humans are often at the top of food chain processes; and they are susceptible to concentration of D.D.T. in their fatty tissues. She appealed for limited use of D.D.T. and for a biological control of insects. Rachel Carson's message was immediately taken up by other ecologists, who showed how other birds - penguins, brown pelican and ospreys - were known to be suffering from the effects of D.D.T. The chemical**

seemed to affect liver activity, where estrogen controls calcium metabolism and, therefore, egg development. The end results of an increase of estrogen metabolism from the influence of D.D.T. was thin shelled eggs which could not support new life. Finally, in 1972, ten years after "Silent Spring", the U.S. Government responded by passing landmark environmental legislation such as the Endangered Species Act, the Wilderness Preservation Act and the National Environmental Policy Act, and by establishing the US Environmental Protection Agency and the President's Council of Environmental Quality. Thus "Silent Spring" paved the way for the enactment of the Federal Environmental Pesticide Control Act, 1972 which empowered the Environmental Protection Agency to ban the use of D.D.T. Later several other persistent chlorinated hydrocarbon pesticides were also banned by the Agency.

3.4.4           Ralph Nader was another writer who was able to influence public awareness both by his involvement in and writings on the Environmental issues. He helped to set up numerous public interest groups around the country that worked on various issues. Under his direction scientists, lawyers and other persons have fought air and water pollution and have publicized many other environmental issues. Recently Nader has founded a national group "Critical Mass", to oppose nuclear power plants (Hedges Laurent, 1977, p.458).

3.4.5            Another person who figures very prominently in the early days of the modern environmental movement and who continues to be a major force through his writings is Barry Commoner. His widely read "The Closing Circle" places him within the ecologic tradition of the environmental movement. The following passage from the book illustrates his commitment to the ecological stability and diversity:

"The amount of stress which an ecosystem can absorb before it is driven to collapse is also a result of its various inter-connection and their relative speeds of response. The more complex the ecosystem, the more successfully it can resist a stress..... like a net, in which each knot is connected to others by several strands, such a fabric can resist collapse better than a simple, unbranched circle of threads which if cut anywhere breaks down as a whole. Environmental pollution is often a sign that ecological links have been cut and that the ecosystem has been artificially simplified" (Commoner, B., 1972, p.38). Commoner was interested in food chains much earlier. More specifically, he studied the effects of nuclear fallout on the environment, through which radioactivity reached humans. Commoner discusses the impact of pollution from synthetic products like detergents, synthetic fibres, plastics, pesticides and fertilisers and the consequent disruption of natural ecosystems such as lakes and rivers.

### **3.5.0 Environmental Movement in United States of America**

**3.5.1 Sierra Club: Sierra Club is an environmental protection group in United States of America. It was founded in 1892 by John Muir to enable people to explore, enjoy and cherish spacious and unpolluted wild lands. Michael Mc Closkey, J. is now the Executive Director of the Club. Joseph Fontaine is the President; Richard Fiddler, Vice-President; Richard Cellarius, Secretary and Denny Shaffer, Treasurer of the Club. It has 345,000 members and it brings out a magazine every two months called 'Sierra'. Other publications include 'Sierra Club Bulletin', 'National News Report', 'International Report', 'Population Report', 'Alaska Report', 'SCLDF Environmental News' and 'Wildlife Involvement News'. Unlike other environmental groups/organisations in the west, the Sierra Club does not lack funds. It is housed in an impressive building with all facilities especially a well organised library. The main objectives of the club is to explore, enjoy and protect the wild places of the earth; to practise and promote the responsible use of the earth's ecosystems and resources; to educate and enlist humanity to protect and restore the quality of the natural and human environment; and to use all lawful means to carry out these objectives.**

**3.5.2 Activities of the Club include the establishment of the National Park Service, the United States Forest**

Service, the Wilderness Preservation System, the Wild and Scenic River System and the creation of individual national parks such as Redwoods, Olympic, Kings Canyon and the north Cascades. In fact, many of the national parks owe their existence to the unflinching efforts of the Club (Darryl, Monte, 1983, p.50). The club also influenced the protection of Yosemite and Grand Canyon National Parks and Dinosaur National Monument from flooding by dams (Hodges Laurent, 1977, p.460). Other programmes of the club include wilderness outings, water trips, skiing, mountaineering etc. The Sierra Club have a political action committee for influencing the Congress and other decision-making bodies. The members of the Club write letters to Congressmen and mobilise public opinion. Influencing the newsmedia, conducting exhibitions, films and conferences are tactics for achieving objectives. The club have from time to time drawn the attention of the court to environmental problems.\*

3.5.3           The Sierra Club had to face many problems in its earlier period: threat of letter bombs; destruction of their vehicles; disapproval of their actions by counter interest groups etc., Ranchers were annoyed that the club had opposed the use of poison to kill wolves which carry

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\*Sierra Club litigation cases is presented in Chapter V of the thesis.



away their sheep. But when it came to the deployment of the famous MX missile site in Utah, environmentalists and cattlemen found themselves on the same side. According to the Executive Director of the famous Sierra Club, nearly 70% to 80% of the country's population want environmental protection (Economic Scene, 1983, p.50). As for the present status of the Sierra Club it has a fairly high prestige at the national level among opinion makers and the media.

**3.5.4 Environmental Defense Fund:** The Environmental Defense Fund was founded in 1967 by some young lawyers and scientists in order to pool their expertise in taking environmental cases to court. Currently Richard, B. Stewart is the Chairman of the fund and DR. Janet Welsh Brown is the Executive Director of the Fund. It has a public membership of 46,000 and a 700 member Scientists Advisory Committee. The Environmental Defense Fund pursues responsible reform of public policy in the fields of energy and resource conservation, pest control, toxic chemicals, water resources, air quality, land use and wildlife. Main activities of the Environmental Defense Fund include conducting research, public education, judicial, administrative and legislative action.\* Within a few days after the Environmental Defense Fund was founded a suit was filed against the Michigan

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\*Environmental Defense Fund litigation case is presented in Chapter V of the thesis.

Department of Agriculture over a chlorinated hydrocarbon pesticides called dieldrin. "It suits against the U.S. Department of Agriculture and later against the U.S. Environmental Protection Agency led to the 1971-1972 hearings which resulted in cancellation of D.D.T. registration in 1972" (Hodges Laurent, 1977, p.461). Publications of the Fund include 'EDF Letter', a bi-monthly and 'The Associate', a quarterly.

**3.5.5 Eisa Wild Animal Appeal:** The Eisa Wild Animal Appeal is a non-profit, tax exempt wild life organization founded by Joy Adanson in 1969 and dedicated to the conservation of wildlife, protection of endangered species and the natural environment. Current President of the organization is Karen Olin Johnston. Donna Fisher is the Vice-President, Leo, M. Lobsenz the Secretary and Eve Rattner the Treasurer of the organization. The Eisa Wild Animal Appeal is affiliated on an international level with branches in Kenya, United Kingdom, Japan and Canada. Publications of the organization include 'Born Free News' which is a quarterly publication and 'Action Alerts' a periodical. Achievements of the organization include the establishment of wildlife sanctuaries, supporting educational projects where young people are encouraged on a local, national and international level to participate in projects. Environmental .. research studies are undertaken pertaining

to wildlife protection and humane treatment of animals. At present an active Conservation Committee acts as an advisory capacity, working with the various governmental agencies at all levels to assure that protection of wildlife and habitat is effectively carried out.

**3.5.6 Environmental Policy Center:** The Environmental Policy Center was founded in 1972. Carolyn Alderson is the present President; Louise, C. Dunlap is the Executive Vice-President and Brent Blackwelder is the Secretary of Environmental Policy Center. Main objectives of the group is to influence Congressional and Executive branch decisions about national environmental issues. Environmental issues relating to national energy policy, water resources, oil, gas, coal, nuclear, synthetic and alternative energy sources and energy conservation. Activities of the group include the supply of information to the public for participation in environmental decisions and serves as a Washington base for local and regional citizen's groups.

**3.5.7 Environmental Law Institute:** The Environmental Law Institute is a non-profit national center for research in environmental law and policy. It was founded in 1969. Present office bearers of the Environmental Law Institute include William Futrell, J. who is the President and Sydney Howe is the Secretary-Treasurer. Publications

of the Environmental Law Institute include 'The Environmental Law Reporter', 'National Wetlands', which is a newsletter and 'ELI Associates' is also a newsletter. Activities of the Environmental Law Institute include research into the law of environmental protection and natural resources use. The Institute designs new institutional arrangements to carry out environmental policy, improvement of institutional ability to implement existing law and provisions of information on environmental law.

**3.5.8 International Oceanographic Foundation:** The International Oceanographic Foundation is a non-profit foundation organized to encourage the general public on conservation of the oceans. It was founded in the year 1953 and has a membership of 60,000. Currently Walton Smith, F.G. is the President, May Smith, F is the Vice-President and Secretary and Douglas Erickson is the Treasurer of the International Oceanographic Foundation. The Foundation brings out two newsletters namely, 'Sea Frontiers' and 'Sea Secrets'. Activities of the group include research study and exploration of the oceans and education of the general public concerning the vital role of the oceans to all life on this planet.

**3.5.9 Friends of the Earth:** The Friends of the Earth, another environmental protection group in United States of America was started by David Brower, a former Sierra Club director. The President of the Friends of the Earth is Rafe Pomerance. The Friends of the Earth publishes a semi-monthly newsletter called 'Not Man Apart'. It is a national Lobbying organisation with affiliates in Canada, Australia, Japan and many European countries. It deals with a wide range of environmental and conservation issues. The 'Friends of the Earth' was the first to start a world energy group aided and supported by thinkers such as Amory Lovins whose soft energy paths has been a trend-setter in suggesting alternative energy sources. According to the President of Friends of the Earth "this decade will be a difficult one for environmental organisations, as a growing population tries to live equitably on a declining resource base. It is painfully clear that the present administration has little understanding of the problems we face, much less<sup>any</sup> clue as to what we can do about them. Friends of the Earth will continue to offer sensible, feasible, economical and equitable solutions - and to press them with all the vigour at its command" (Economic Scene, 1983, p.51).

**3.5.10 Environmental Fund:** The Environmental Fund was founded in 1973 to make the public aware that if population growth continues indefinitely, the environment cannot be

saved. Cordelia, S. May is the Executive Director and Garrett Hardin is the Director of the Environmental Fund. Publication of the Fund includes 'The Other Side', edited by Sharon Lynn. Activities of the fund is the popularising of environmental education. It advocates population stabilization and decline in population so that all could live in reasonable comfort and dignity.

3.5.11 Envirosouth: Envirosouth is a private, non-profit environmental public information service organization. John Bloomer is the Chairman of Envirosouth and Martha McInnis the President. It publishes a quarterly 'Enviro South'. The members of the group work in the States of Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina and Tennessee. It provides information on almost all aspects of environmental issues.

3.5.12 International Game Fish Association: This environmental group was founded in 1939. It is a non-profit, tax deductible organization which maintains and promotes ethical international angling regulations and compiles world game fish records for saltwater, fresh water and fly fishing. Elwood, K. Harry is the President and Dalley, C. Lewis, the Vice-President; Ogden, M. Phipps, Treasurer and George, G. Mathews, the Secretary of the Association. The Association maintains an international library of angling literature

and history. It has 150 international representatives and 1000 affiliated fishing clubs. Membership is open to interested persons and organizations. Activities of the Association include research. It encourages and supports game fish tagging programmes and other scientific data collection. It sponsors 'Annual IGFA Fishing Contest' and 'Annual Marine Recreational Fisheries Symposium' in conjunction with other organizations.

3.5.13 Sierra Club Legal Defense Fund: The Sierra Club Legal Defense Fund is a non-profit, tax-deductible corporation created to support lawsuits brought on behalf of citizens' organizations to protect the environment. Frederic, P. Sutherland is the Executive Director of the Sierra Club Legal Defense Fund. It provides lawyers to bring environmental cases. The Fund also engages in administrative proceedings before Federal, state and local agencies.

Other environmental conservation groups in U.S.A. include 'Sea Shepherd International', 'Sierra Club Foundation', 'International Institute for Environment and Development', 'International Primate Protection League', 'International Society of Arboriculture', 'International Union for Conservation of Nature and Natural Resources', 'Environmental Action', 'Environmental Action Foundation', 'Environmental Research Institute', 'Environmental Task Force' and 'Federation of Fly Fishermen'.

### **3.6.0 Environmental Movement in United Kingdom:**

**3.6.1 The Tree Council:** In Britain a small independent body called 'The Tree Council' first launched 'The National Tree Week' way back in 1973 and has made it an annual event ever since. The Week aims to promote and publicise trees as much as possible, to make state and central governments aware of how important they are, and how rapidly they are disappearing. At the same time it tries to tap the public goodwill towards trees and to gather funds. It hopes that 50 million trees can be planted over the next three years.

**3.6.2 Association of Public Health Inspectors:** This is a professional body representing over 6000 public health inspectors working in local government, industry and overseas. It pursues a vigorous educational and public relations programme, maintaining contact with government departments and taking active steps to keep members informed of current policies and developments on all aspects of environmental health. This it does through week-end schools, seminars, Branch and Centre meetings, conference and the publication of Practice Notes and the Association's official journal 'Environmental Health' (Brooks P. Peter, 1974, p.205).

**3.6.3 Conservation Corps:** The corps is composed of volunteers who devote some of their spare time at week-ends and holidays to practical work of conservation. The corps



is the field force of the British Trust for conservation volunteers, a registered society formed to run and finance the corps and to further national interest in the practical conservation of the countryside. Members of the corps aim to assist the maintenance the beauty of the countryside and to train and educate themselves in the principle and practice of nature conservation and to assist in the maintenance and management of natural resources and scientifically important sites.

3.6.4 Conservation Society: This was founded in 1966 to provide a stabilized population and an economy that does not destroy the environment. The aim of the society is to live within the renewable resources of the earth, and not beyond their limits.

3.6.5 Friends of the Earth: This association was formed to alert the general public, government, industry, trade union and other sectors of the community to environmental problems and issues and to campaign actively for constructive and rational solutions. It is primarily a campaigning association undertaking political and legal action throughout the country. Examples of major campaigns with which it was associated were those focusing attention on 'non-returnable bottles' and 'throw away packages', the 'Snowdonia Campaign' and the 'endangered species campaign' (Brooks Peter, P., 1974, p.208).

**3.6.6 National Society for Clean Air:** This is a society dedicated to furthering the cause of clean air. Membership is open to individuals, local authorities and businesses, and consideration is being given to a special rate for school and college membership. Publicity for clean air policies and developments is achieved through lectures, exhibitions, a publicity advice service and the issue of posters, wall charts, leaflets and general publications. The society also maintains a library and offers advice, assistance and information to subscribers on all matters relating to the atmospheric pollution and its preservation. The society's Year Book provides a wide range of information on many aspects of atmospheric pollution.

**3.6.7 Society for the Protection of Ancient Buildings:** Founded in 1877 the society is dedicated to the preservation of irreplaceable ancient buildings. It advises on the repair and maintenance of old buildings, investigates cases of buildings neglected or threatened by damaging treatment or by destruction, prepares surveys and reports on historic areas of cities, towns and villages, holds annual courses on the repair of ancient buildings, arranges lectures, conferences and exhibitions. Some technical pamphlets dealing with such subjects as 'outward leaning walls' and 'smoking chimneys' were also published.

### 3.7.0 Environmental Movement in Asian Countries:

3.7.1 Japan Victims Movement: In the 1960s, the environment in Japan was so rapidly destroyed that 'Kogai', which meant public damage, became a common word in daily conversation. The damage was not only material, but also on the health of people and even many lives were lost by heavy pollution 'like Minamata disease, Itai-itai disease, asthma etc. In the latter half of 1960s the damage became so heavy, that the victims of pollution had to rise up to protest and their self help movement became one of the most serious domestic issues in Japan. Two successive Minamata disease cases, Itai-itai disease (cadmium poisoning) and Yokkaichi asthma became court cases asking for the clarification of cause-effect relationship, settlement of polluter's responsibility and compensation for the pollution damage. The youth of Japan helped to promote the victims movement (Desh Bandhu and Ramanathan, N.L., 1982, p.174).

3.7.2 Environmental Non Governmental Organisations (NGOs) in Indonesia: The history of the environmental NGOs in Indonesia started a long time before the Ministry of State for Development Supervision and the Environment. This was set up under Prof. DR. Emil Salem in 1978. These environmental NGOs can be put roughly into 4 categories according to the scope of their activities: (1) nature lover groups,

(2) professional organizations, (3) hobby groups and (4) community development organizations both in rural and urban areas. However, the efforts of individual groups seemed very little and hence it was felt that this could be done by increasing communication and co-ordination between the different groups. Hence, the association for the conservation of the Indonesian environment invited several organizations to a meeting in Jakarta in May 1978. It was decided at this meeting to establish the "Group of Ten" for the development of the environment as a communication forum and as a means of bridging the gap between government and people. The formation of the Group of Ten was supported by the Ministry of State for Development Supervision and the Environment and the Governor of Jakarta. It was hoped that through this new organization, Environmental NGOs would be able to play a role in decision-making on matters concerning the environment. Member organization of the Group of Ten are active in several fields. There are conservation education groups such as the Green Indonesia Foundation which publishes a magazine for schools and gives lectures and slide shows on the environment to the general public.

**3.7.3 The Consumers' Association and the Association of Indonesian Architects** together set up a big environmental exhibition. An environmental poster competition was organised by the Association for Journalists in Science and Technology.

and anti-litter campaigns have been carried out by the 'Conservation Foundation' and the 'Gardens and Environment' Group. Industrial pollution has been monitored by the Village Planning Organization in Central Java and the Study Group for Environmental Pollution and the Biological Science Club investigated pollution in the Bay of Jakarta and the rivers flowing into the Bay.

**3.7.4 Indonesian Environmental Forum (IEF):** The IEF was set up to channel the activities of Environmental NGOs into a national context and above all to emphasize the need to increase public awareness campaigns and environmental education. The IEF has put into effect several programmes in the field of communication and information, for example publication of a monthly bulletin, collection of information from nature lover groups, research expeditions and dissemination of the information on Environmental NGOs. In the year 1980-1981, IEF held four workshops in Java with sessions on: Why conservation is necessary?, different types of ecosystems, the necessity of preserving a rich flora and fauna, the conflict between development and conservation and health and wildlife photography. The IEF brings together different organisations with individual resources of money expertise and technology, so that they can pool their resources and implement a programme together. This was done for the Cilwing River "Clear Water"

programme in Jakarta, organised successfully by the joint venture of the Biological Science Club and Women's Groups (Desh Bandhu and Ramanathan, N.L., 1982, p.173).

**3.7.5 Philippine Movement for Environmental Protection (PMEP):** With the encouragement of the U.S. government and backed up by loans from the World Bank, the Marcos administration started preparing the site for the Bataan Nuclear Power Plant in early 1976. Opposition to the project grew in due course involving many sectors of Philippine Society. Mimeographed materials depicting the hazards of nuclear power plants were distributed in parish churches and were passed on to others quietly. Many groups coming from various sectors - workers, students, professionals, housewives and priests knew about the nuclear issue through the efforts of the Philippine Movement for Environmental Protection (PMEP). Individuals and associations from other countries generated interest and numerous letter campaigns were resorted to and three International Days of Protest against the export of a Westinghouse nuclear reactor to the Philippines were held in United States of America, Australia, Japan, Canada, West Germany, Spain, France and Switzerland. Many groups and associations such as environmental groups, human rights, labour and Consumer groups came together to oppose the Bataan Nuclear Reactor Export to Philippines (Desh Bandhu and Ramanathan, N.L., 1982, p.202).

**3.7.6 The Environmental Protection Society:** Two years after Stockholm Conference on the Human Environment the Environmental Protection Society of Malaysia was formed in the year 1974. It is a voluntary body of concerned Malaysians from all walks of life who are anxious about the deterioration of the environment and who feel that citizens must contribute towards preserving the environment. Its activities include the organization of forums and talks, issuing press statements, conducting seminars and doing research. The Society publishes a quarterly magazine called 'Alam Sekitar'.

**3.7.7 The Malayan Nature Society:** This society has branches in nearly every part of Malaysia. It organises indoor activities in the form of talks, forums, slides and film shows. There are discussions related to environment and conservation issues and outdoor activities such as nature walks and camping. The aim of the society is to promote an interest in the natural history and conservation of wildlife and natural resources in Malaysia. It publishes articles directed to the layman on the natural history of the region and includes news on the developments in conservation both in the region and worldwide. The society publishes a quarterly journal called 'Malayan Nature Journal'. This journal carries original and review articles pertaining to the natural history and biology of the Malaysian region. Besides a supplement to this journal is the 'Malayan Naturalist', a quarterly newsletter devoted to furthering the objectives of the 'Malayan Nature Society'.

**3.7.8 Friends of the Earth, Malaysia** was formed in 1977 to act as a concerned citizens group to campaign against the deterioration of the environment and taking up issues related to the environment. The issues ranged from the problems of the depletion of water and fish resources, felling of forests, extinction of wildlife and destruction of other invaluable natural resources, problems related to soil erosion, effect of drought, continuing occurrence of floods, widespread misuse of pesticides, pollution from quarrying and mining activities, indiscriminate disposal of sewage and industrial effluents and dangers of nuclear energy. Since its inception several work programmes have been implemented and information documented on various issues affecting the environment. Studies and research have been conducted on environmental problems, statements and memorandum released and it has conducted several public exhibitions, talks and seminars and initiated newspaper columns on environmental issues in Malay, English and Chinese national dailies, thus generating awareness and interest among the public.

**3.7.9 The World Wildlife Fund Malaysia** publishes a quarterly newsletter 'Conservation Malaysia' which provides information and articles on wildlife and news items on the conservation movement in Malaysia. The organisation is active in public education. It has a mobile education unit equipped with films and pamphlets for providing educational programmes especially for schools.



### **3.7.10 Environmental Foundation Limited (EFL) - Sri Lanka**

The Environmental Foundation Limited came into existence in order to protect the environment through legal action. Thus the Environmental Foundation Limited is a similar organisation to the Environmental Defense Fund of U.S.A. and the Friends of the Earth Limited of Great Britain.

The main objectives of the EFL is to undertake environmental cases in courts, to provide legal advice and assistance where necessary, especially to lawyers in the prosecution of environmental cases, to monitor state regulatory agencies, to foster public awareness, to enforce and agitate for reform of conservation laws, to conduct and initiate research and study, to undertake and finance projects to repair environmental damages where possible and to promote the beneficial and planned use of natural resources.

### **3.8.0 Environmental Movement in India:**

3.8.1 The problems of environment in a country like India are so large and diverse that a number of environmental enthusiasts have got together to form various groups, associations and organisations for the protection of the environment. These groups could be termed as the 'Non-Governmental Organisations (NGOs)'. At present 157 NGOs are registered under the Societies Act while 30 of them are

non-registered organisations, but actively engaged in the field of environmental protection. The maximum concentration is found in the Union Territory of Delhi (26) followed by the States of Uttar Pradesh (24), Maharashtra (23), West Bengal (23) and Kerala (17). There are no NGOs in some states of India especially in Maryana, Nagaland, Sikkim, Tripura and Union Territories like Andaman and Nicobar Islands, Arunachal Pradesh, Dadra and Nagar Haveli, Lakshadweep, Mizoram and Pondicherry. The NGOs bring out very useful publications on environment. These include reports, proceedings of seminars and workshops, newsletters and journals. Many of them offer technical assistance and consultancy services on environmental problems. Based on the objective to be achieved the NGOs can be grouped into nine categories namely: (1) Environmental Education and Awareness (2) Nature Conservation and Natural Resources (3) Pollution Control (4) Afforestation and Social Forestry (5) Floristic and Faunal Studies (6) Rural Development (7) Wildlife Conservation (8) Waste Utilisation and (9) Eco-development.

**3.8.2 State-wise Distribution of NGOs: Andhra Pradesh**  
Natural History Society was founded in 1976 and is a registered society with 352 members. The President of the society is Shri. K.S.R. Krishnaraju. Funds for the society come mainly from donations, grants and membership fees.

The main objectives of the group are eco-development of Andhra Pradesh, to conduct studies on wildlife conservation, impart nature education classes and to undertake ecological investigations of flora and fauna. 'Kingfisher' is a quarterly publication of the society. Report on the preliminary ecological study of the Eastern Ghats, sponsored by the World Wildlife Fund has been published by the society. Activities of the group are environmental education, research, ornithological studies in the Eastern ghats and various research projects on the flora and fauna of the Eastern ghats.

### 3.8.3 Assam Valley Wildlife Society Founded in 1973

it has 134 members and is a registered society. Shri. M.P.S. Sidhu is the Chairman of the society. The main objective of the society is to capture and breed near extinct and rare species of wildlife. Funds for the society come mainly from membership fees. 'Rare, Endangered and Spectacular Fauna and Flora' ( February 1982) and 'Miraculous Wildlife' ( January 1983) are the two publications of the society which have been released. Activities of the group include the captive breeding of White Winged Wood Duck at the aviary at Bordubi Tea Estate in upper Assam. Achievements of the group are the breeding of Pygmy Hog an extinct species which was handed over to the Assam State Zoo.

**3.8.4 Bihar Environmental Action Group was founded in 1981 with Professor Sinha, M.P. as its President. At present it has a membership of 500 members and two regular publications namely 'Environmental Echo' a quarterly journal and 'Environ Voice'. The main objective of the group are to create environmental awareness, identify environmental problems in diverse areas, suggest remedies, co-operate with other organisations with similar interests, organise seminars, workshops, camps, publish relevant literature, establish information cell to collect environmental data and translate environmental literature. Activities of the group are afforestation and tree plantations, programmes for mass awareness and publications of bulletins on environment in regional languages.**

**3.8.5 Wildlife Conservation Society in Gujarat was founded in 1975. It has 200 members and Sri. Shivbhadresinhji, M.K. is the President of the society. Funds for the society come mainly from donations and membership fee. Objectives include environmental education, creating an awareness of the problems of overgrazing and fostering ideas for the protection and preservation of wildlife. Pamphlets highlighting environmental issues in English and regional languages have been published. Achievements of the group include persuading the public to donate dead bodies to the**

M.P. Shah Medical College, thus indirectly saving trees from being cut down as fuel wood for cremation.

**3.8.6 Mountain Eco-Conservation and Wildlife Society of India** was established in Jammu and Kashmir in the year 1981. The present President is Dr. S.M. Das. The group has 60 members and a half yearly journal entitled 'Journal of Mountain Ecology' was published by the society. Objectives of the group are conservation of environment and wildlife, protesting against felling of trees and organising seminars and workshops on the 'Five F's' i.e. fodder, firewood, fuel, fruit and food for self sufficiency. Activities of the group are the organisation of a national symposium on mountain ecology.

**3.8.7 Millions of Trees Club in Karnataka** was established in 1949 with 17 members. The President of the club is Shri. Ram Kivra Mischra. Objectives of the club are: (a) to develop a national organisation to promote people's forestry (b) to work with students especially to encourage school nurseries and to develop the theme 'Let every child plant a tree'. A quarterly journal entitled 'Youth Nestler' is published by the club. Source of funds come from donations, grants and membership fees. Activities of the club include massive tree planting in a few demonstration villages and teaching farmers and youth on new techniques in tree planting.

**3.8.8 Movement by Tribals in Madhya Pradesh:** Political interference had hindered a solution to the problems of pollution created by the Bailadila iron ore mines in the tribal tract of Bastar in Madhya Pradesh. The National Mineral Development Corporation which runs the mines, the largest in Asia, is unable to construct a tailing dam to prevent the flow of iron ore wash into river Sankhimi because the tribals had threatened to launch an agitation against environmental pollution.

**3.8.9 The Society for Clean Environment (SOCLEEN)** was founded in December 1969 as an All India Public Society registered under the Bombay Public Trusts Act, 1950. Several experts and reputed persons from fields of Science, Technology, Medicine Education and Social Service are the members of SOCLEEN. The society has also on its rolls a number of industries as donors and patrons. Dr. P.J. Deoras is the present President of the group and has a membership of 326. Aims and objectives of the group are environmental education through lectures, film shows and radio talks, collection, publication and distribution of literature on the subject of environmental control and protection and encouragement, sponsoring of special studies on the sources, causes and effects of environmental pollution. SOCLEEN, during the last 14 years of its existence has generated general awareness not only among the masses but also among the concerned authorities on the perils of deteriorating

environment in the country. A number of studies have been conducted to assess the impact of pollutants on school going children residing in Chembur. During the Ganesh and Navaratri festivals noise level studies were conducted in different areas of the city. It has provided technical expertise to Water Pollution Control Board and to other organisations. A quarterly journal entitled 'Scavenger' is published by the group. During the last few years it has taken up a number of educational projects, protection of hill project and training school-going students on environment protection. It has come out with a number of special reports on specific issues connected with environment. A number of seminars were conducted from 1971 to 1981 and the proceedings of these seminars have been received well both in India and abroad.

3.8.10 Friends of Indian Wildlife in New Delhi was established in 1979. There are only 18 members. Shri. Chowdhury, A.K. is the President of the group. The main objectives of the group are conservation of nature, arousing environmental consciousness, organising films, audio visual displays, lectures etc. and encouraging nature study tours and camps. Activities of the group include the issue of cards to the public appealing for nature conservation. Nature study camps and visual coverage of environmental aspects are shown to the public through photographs and movies.

**3.8.11 Orissa Environmental Society** was established in 1982. It has 35 members and Shri. Prasanna Kumar Das is the President of the society. The society aims at promoting knowledge of nature, practising conservation of nature, organising seminars and publishing literature on environment. The proceedings of a seminar conducted on 'Environmental Education and Natural Resource Management' have been published by the society. Activities of the group are the celebration of 'World Environment Day', organising workshops on environmental protection and creating an awareness on the dangers of environmental pollution. Essay competitions and debates have also been arranged on environmental problems.

**3.8.12 Indian Ecological Society in Punjab** was founded in 1974. It has a membership of 436 and Dr. A.S. Atwal is the present President of the society. Source of funds come mainly from grants, advertisements, membership fees and library subscriptions. Objectives of the group are to encourage and promote ecological studies and to integrate research in different fields of environmental problems. 'Indian Journal of Ecology' and 'Ecology Bulletin' are the two publications of the society.

**3.8.13 Rajasthan Environment Preservation Society**: The society was founded in the year 1982. Shri. Kak, V.N. is the President of the society. The society consists of 42



members and source of funds come mainly from donations, grants and membership fees. The objectives of the society are to preserve natural environment from deterioration. Activities of the society are the preservation of wildlife, plantation of trees and controlling of water pollution in many areas of Rajasthan.

**3.8.14 Madras Naturalists Society** was established in 1979. The society has 80 members and Shri. Rajan, V.J. is the present President of the society. Funds for the society come mainly from membership fees and grants. The aim of the society is to promote knowledge of natural history, through lectures and film shows/slides on environmental degradation. Other objectives include visits to wildlife sanctuaries, issue of publications on ecological pollution problems in Madras and to conduct nature camps and films for school children. The society has organised school groups for tree planting and various studies have been conducted on pollution problems in Madras.

**3.8.15 The Chipko Andolan in Uttar Pradesh:** The Chipko Andolan, a movement to protect trees in the Himalayan areas, is probably the world's most well known grassroot eco-conservation movement. The movement originated in the year 1973 and could be considered as a movement of women at the initial stage. In the month of March 1973 some representatives

from a sports goods factory at Allahabad reached Gopeshwar to cut 10 ash trees near the village Mandal. The women folk of Mandal courteously told them not to do so, but when the contractors persisted they hit upon the idea of hugging the ash trees and hence the popular name 'Chipko Movement'. Some weeks later the same contractor with some representatives from the forest department came to a site called Rampur Phata, another village 80 km. away from Gopeshwar to fell ash trees to meet the requirements of the sports goods factory. As soon as the villagers of Gopeshwar got the news, they marched to Rampur Phata with drums and songs thereby attracting more people to join in the agitation. The agitators hugged the earmarked trees and once more prevented cutting of the trees. The Chipko Movement reached its climax in 1974, for in that year the women of village Reni, 65 km. from Joshimath barred the path to the forest, thereby preventing the contractor and his men from cutting the trees. The women of Reni with Gaura Devi, an illiterate woman of 50 years as their leader, sang the following songs:

"This forest is our mother's home,

We will protect it with all our might"

(A Citizen's Report, 1982, p.42).

**3.8.16**            The circumstances that led to the Chipko Movement could be traced to the floods in 1970 which left a deep impression on the women folk and with it followed

the appreciation of the vital ecological role that forests play in controlling floods. The non-violent Gandhian character of the movement helped to unite the villagers of Himalayas and drew attention of the press and the public even at the international level through articles and television programmes (A Citizen's Report, 1982, p.42).

3.8.17                   The movement in due course acquired the support of two eminent leaders: Chandi Prasad Bhatt from Gopeshwar and Sunderlal Bahuguna from Silyara in the Tehri region. Chandi Prasad Bhatt organised the country's largest voluntary afforestation programme through eco-development camps sponsored by the Dasohli Gram Swarajya Mandal. These camps brought together local villagers, students and social workers and planted over a million trees (A Citizen's Report, 1982, p.42). Sunderlal Bahuguna organised many social activists in the area to protest against deforestation and environmental deterioration. For instance, in Hanwal Ghati, Chipko activists bandaged pine trees with mud to protest against indiscriminate tapping of trees. His main focus was the spreading of Chipko ideas far and wide. In 1981, Bahuguna started on a queer venture of footmarch from Kohima to Kashmir - 4,000 km. distance from western to eastern Himalayas - to campaign against deforestation.

**3.8.18**                    **Three main contributions of the Chipko Movement are:**

- 1)    The indiscriminate felling of Himalayan trees by contractors and other agencies including the government was stopped by the Chipko activists.**
- 2)    Afforestation was encouraged on a large scale at the initiative of voluntary associations.**
- 3)    Public awareness on the need to protect forests for maintaining ecological balance and to preserve the beauty of nature was created by many voluntary agencies.**

**3.8.19**                    **Recognition of the contribution of Chipko Movement is quite evident from the fact that Chandi Prasad Bhatt was awarded the Ramón Magsaysay Award for his contribution to eco development.**

**3.9.0**                    **Conclusions**

**A review of literature on the environmental protection groups shows that there is an environmental consciousness all over the world. Developed countries like the United States of America and United Kingdom have already shown their interest in environmental protection and conservation by organising groups/associations.**

**....**

## CHAPTER - IV

### 4.0.0 ENVIRONMENTAL PROTECTION MOVEMENT IN KERALA

#### 4.1.0 Introduction

4.1.1 During the past few years deterioration of the environment has become a major issue for discussion and debate in India. This concern for a better environment with clean air and water for the people is not something unheeded in the past. In fact King Asoka (242 B.C.) and King Akbar (1526 A.D.) recognised the importance of plants and animals and restricted their destruction. The main difference now, as compared with the bygone centuries, is that public opinion is at last beginning to support individuals and organisations who, in the past, have often campaigned for improvement of environment without receiving the support they deserved. Today public awareness on the importance of protection and improvement of environment has inspired several groups in popularising ideas on ecology and environment. With regard to Kerala, a debut in this direction was made by the Cochin Science Association, under the aegis of which a special working group on environmental protection was formed in 1971. The working group collected information on air, water and soil in and around Cochin and the data were presented in a seminar organised in

collaboration with the Kerala Sastra Sahitya Parishad. The first comprehensive discussion on environmental problems of Cochin took place in that forum which passed resolutions, one of which was a request to the Cochin University to start a Department of Environment and to institute fellowship for environmental studies and research. As a result of untiring efforts of the Environmental Brigade organised under the Kerala Sastra Sahitya Parishad, a wider public awareness was created in Kerala and even at the international level on the controversial 'Silent Valley Hydro electric Project' in Palghat district. The 'Hindustan Paper Corporation' at Velloor and the 'Naveer Rayons' factory at Calicut also gained the attention by the efforts of the environmental protection groups. Several agitations have arisen from time to time in Kerala on environmental issues arising from discharge of industrial effluents into rivers like Periyar, Chaliyar, Pampa, Kallada and Moovattupusha. Construction of hydro-electric projects, bunds, deforestation, over-exploitation of natural resources, habitat destruction, dumping of radioactive materials, release of gaseous pollutants in/<sup>to</sup>the air, excessive sound and the clogging of water bodies by the water weed 'Salvinia' have given shape to various environmental protection movements all over Kerala. 'Periyar Bund Action Council', 'Save Silent Valley', 'Kerala Sastra Sahitya Parishad', 'Anti Pollution Action Committee for Moovattupusha', 'Society for Protection of Environment Kerala' 'Malabar Fauna and Flora Society' and many other local groups and associations are prominent in the environmental protection movement in Kerala.

**4.1.2 Development during 1970s:** During the last decade there has been major changes in our attitudes to and perceptions of environmental problems. Prior to 1970, public awareness of serious environmental deterioration was primarily limited to 'shock' events at the international level like the experience of the people of the Marshall Islands in the Pacific who received massive doses of radiation particularly when the U.S. tested the biggest H-bomb in 1954, the London smog of 1952 and the minimata disease which broke out in Japan in the 1960s. In Kerala with higher level of education, people became aware of these environmental issues, and events concerning environmental deterioration had profound influence on certain segments of the population, particularly the educated middle class and professionals.

**4.2.0 Voluntary Organisations Engaged in Environmental Education and Awareness**

**4.2.1** The social backgrounds in which environmental movements in Kerala originated differ from place to place and from one environmental issue to other. The complex nature of environmental problems provided a qualitatively different approach for environmental groups. Kerala with a high rate of literacy could become sensitive to the serious nature of environmental problems. But we find that voluntary organisations working for environmental protection in Kerala are not large in number or in size in their membership composition.

The Kerala Sastra Sahitya Parishad, an organisation devoted to popularising science, is perhaps the only organisation that has made significant impact on environmental issues and problems in Kerala. Started in 1962, it has grown into a mass movement attracting thousands of members from various sections of society. Involvement of the Kerala Sastra Sahitya Parishad with the environmental movement became very conspicuous only with the famous 'Silent Valley Hydro Electric Project' controversy in the year 1978. Towards the second half of 1970s, many environmental groups began to take shape in various parts of Kerala. Though limited in number and in membership, some of them have really contributed to the cause of a better environment through their programmes and attention getting tactics. Thus, it could be said that voluntary organisations in Kerala have brought about some kind of public awareness which is essential for successful action in any area of activity concerning the environment. Such environmental groups could draw the attention of people to major issues like 'Silent Valley' to a minor one such as 'Sound Pollution in Trichur'. Environmental groups in Kerala have experienced many difficulties in their pursuits but the groups could make environmental care a live issue even today.

4.2.2            A study on these environmental protection groups in Kerala -- their structure in terms of membership, affiliations, objectives and programmes, role assignments to



members and strategy and tactics adopted for the achievement of objectives etc. - may reveal the factors associated with their success or failures. The researcher considered these as 'Environmental Protection Pressure Groups' and not merely 'Environmental Protection Groups' for decisions relating to programme planning and implementation for a better environment are not within the authority structure of these voluntary groups. These groups by their programmes and strategies act only as a force for influencing the decision makers - management of a particular industrial unit, local bodies, the legislature and the government and its administrative machineries. Detailed analysis of the structure, strategies and role of environmental protection pressure groups is given in Chapter-VIII of the thesis. However, brief descriptions of important environmental protection pressure groups are given in this section to highlight the background of Environmental Protection Movement in Kerala.

**4.2.3 The Cochin Science Association:** The Cochin Science Association can be regarded as one of the founding fathers of the Environmental Movement in Kerala. Founded in 1967, it helped in popularising ideas on science, ecology and environmental conservation. It has 125 members and most of them are scientists. The members of the Cochin Science Association conducted environmental education classes on environmental protection, cleanliness and preservation of flora and fauna.

These classes were conducted in schools, colleges, women's associations, rotary clubs and rural areas.

4.2.4 Kerala Sastra Sahitya Parishad: Founded in 1962 as a forum of Malayalam science writers it grew into a people's science movement by the year 1967. Over the years it swelled in membership and today it has more than 4,000 members belonging to various sections of the society such as medical professionals, engineers, lecturers, scientists, lawyers and laymen. It has 50 local units in various parts of Kerala.

4.2.5 **Achievements of the Kerala Sastra Sahitya Parishad** include mass education campaigns conducted in January 1976 where nearly 12,000 classes on 'Nature, Society and Science' were conducted in towns, villages, schools, colleges, rural libraries, hostels and market places. In 1977 mass educational programmes on 'The Resources of Kerala', 'Agriculture' and 'Public Health' were explained scientifically to the general public. This mode of informal education proved a great success which encouraged the Kerala Sastra Sahitya Parishad to organise a 'Sastrasamaskarika' ('Science and culture') jatha in October-November 1977. The Parishad volunteers travelled in jeeps from the northern part of Kerala, right down to the south and spoke to more than five lakhs of people. Every year the Kerala Sastra Sahitya Parishad brings out one major publication such as 'Man and His Environment', 'Appropriate Technology' and 'People's Health'. 'Sasthragathy', 'Sasthra

**Keralam', 'Eureka', 'Grama Sasthram' and 'Bala Sasthram' are the five monthly magazines published by the Parishad.**

4.2.6 In the field of environmental awareness some action-oriented research has been conducted by Kerala Sastra Sahitya Parishad pertaining to environmental problems. A study has been conducted on the 'socio-economic and ecological consequences of water control projects: the case of Kuttanad in Kerala'. On the basis of primary and secondary data, a report was prepared and published for the general awareness of the public even outside Kerala (Kannan, K.P., 1979, pp.1-6). The second action-oriented research was relating to the pollution of Chaliyar river by the Gwalior Rayons factory. A solution to the problem of pollution in Chaliyar river was found difficult for want of a suitable technology for treating the effluents. At this stage, the Kerala Sastra Sahitya Parishad brought out a report suggesting alternative proposals for reducing the harmful effects of pollutants (KSSP, 1979, p.21). The other action-oriented research was related to the "Silent Valley" issue. A report prepared by Kerala Sastra Sahitya Parishad formed the basis of the mass campaign for the preservation of Silent Valley. The mass campaign was started by K.S.S.P in collaboration with other organizations both within Kerala and other parts of India (Prasad, M.K., 1979, p.21).

4.2.7 Friends of trees: Another group in Kerala devoted to environmental protection is the "Friends of Trees" in Cochin. The main objective of this group is the maintenance of ecological balance and beauty of nature. The group opposed the commercial felling of trees, protested against deforestation, propagated ideas on the crucial ecological role of trees and encouraged the young and old to plant more trees. The 'Friends of Trees' also opposed the Silent Valley Hydro Electric Project and filed a suit against its implementation.

4.2.8 Malabar Fauna and Flora Society: The Malabar Fauna and Flora Society in Cochin, the 'World Wild Life Fund' in Cochin and the 'Kerala Natural History Society' in Trivandrum and Calicut are also devoted to environmental protection. These groups campaigned against the deterioration of the environment and raised issues relating to the environment such as depletion of water and fish resources, extinction of wild life and habitat destruction caused by ecological imbalance and environmental pollution.

4.2.9 The 'Public Interest Law Society' and the 'Committee for the Advancement of Legal Literature' : These two groups are different associations with overlapping objectives. These groups consist of associations of lawyers who give free legal aid to the general public concerning environmental

issues. These groups also help the public to take up issues relating to environmental problems; to the courts for remedial measures.

#### 4.2.10 Organisation for protection from nuclear radiation:

Another recent group for environmental protection is the "Organization for Protection from Nuclear Radiation" at Kothamangalam. This group propagates ideas on the ill effects of nuclear plants which would affect the physical and psychological health and community well-being of local citizens, if proper evaluation on the implementation is not given due consideration. A paper entitled "Atomic Reactor in Kerala - a report on its advisability" presented by the organisation quotes the incidents of dangers of nuclear radiation experienced by the people at Three Mile Island in the United States of America. Though such groups are limited in number, it is, in fact, one of the pioneer groups working in Kerala for protection from nuclear radiation.

4.2.11 A study on the environmental groups in Kerala is perhaps an unexplored field and an indepth study in this area would provide ample data on the emergence and achievements of environmental movement in Kerala. Besides associations and groups referred to above, there are other groups that have been formed spontaneously as a result of some particular environmental issue in certain local areas. A study

of these groups working against specific agents causing environmental problems will be quite interesting and hence the researcher has collected data on the origin, structure, function and programmes of these groups for the presentation of case studies. Seven such case studies are presented below:

#### 4.3.0 Case Study No.1 : Periyar Bund Action Council

4.3.1 Background: The largest concentration of small scale and large scale industries in Kerala is located in the Eloor-Kalamassery industrial belt. Most of these industries are chemical units which have their fresh water intake from the Periyar river on the banks of which they are located. The river Periyar originates in the high ranges of the Western Ghats. It is one of the major rivers in Kerala and has a length of 244 kms. with an estimated average of  $11,600m^3$  volume of water. The river splits into two branches at Alwaye. The northern branch finds its way to the Arabian sea. The southern branch further breaks into two more branches called Eloor branch and Edamula branch. The demand for the river Periyar has been rising over the years for the supply of water to industries, power, agriculture and fish and prawn culture.

4.3.2 Travancore Rayons the first factory located on the banks of the river Periyar/<sup>was established</sup> in the year 1946. The Eloor-Kalamassery belt has eight factories clustered on either

side of the river, namely the Indian Aluminium Company, the Travancore Cochin Chemicals, the Fertilisers and Chemicals Travancore Ltd., the Hindustan Insecticides Ltd., the Cominco Binani Zinc Ltd., the Indian Rare Earths Ltd., the Periyar Chemicals and the Catalysts and Chemicals. All these major industrial concerns have their fresh water intake directly from the Edamula branch of the Periyar. The Edamula branch is much exposed to the saline waters of the Vembanadu backwaters. As a result, a series of man-made bunds are erected annually across the Edamula branch to save the industrial units from the ill effects of saline water. Edamula, Always, Manjummel and Manjali are strategic points where these bunds are located. These earthen bunds enable the Edamula branch to have fresh water at all seasons. Fig.4.32 in Appendix-IV(c) shows the strategic points where the different bunds are located.

4.3.3 Nature of the problem: In 1982 the salinity problem became acute because of the absence of rain for nearly five months. Industrial concerns, newspapers and even local groups created some sort of publicity over the event. Most of the major public sector undertakings in the Always-Elloor area had to close down their plants due to the damage caused by saline water. It was believed that an increase of salinity would cause a serious threat to the drinking water supply of the residents of Cochin and Always. The salt content in the

potable water distributed in Always, Cochin and surrounding towns had gone <sup>up</sup> from 10 ppm to 100 ppm.\* Since a large number of plants in various establishments were affected, the state government was alerted to find a solution. As an immediate and temporary solution, permission was given for constructing a temporary earthen bund at Pathalam on the Periyar river. On 3rd March 1982, a new earthen bund was put up at the specified place by the Public Works Department of the Government of Kerala. It measured 100 metres in length and had a breadth of 10 metres. The saline water entrapped in between the Manjummel, Pathalam and Always bunds were pumped out until the concentration of salinity reached limits safely acceptable to all the industries. The closed factories were reopened one by one.

4.3.4            However, the problem did not end with the construction of the new bund. In fact the location of the new bund was most ill-suited for the free dispersion of industrial effluents discharged into the river. The bund was located immediately downstream of the effluent outlets of a large number of big industries. As a result large volume of effluents discharged remained stagnant at the upstream side of the bund, there being no possibility for dilution and dispersion. According to the Kerala State Board for Prevention and Control of Water Pollution, there was considerable concentration of

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\*ppm = parts per million.



fluorides, phosphates and ammoniacal nitrogen in the river water. Besides there was the lowering of pH value\* of the river water to an alarming value of 1.9.

4.3.5 A social group called 'The Periyar Bund Action Council' was formed on 18th April 1982 at a place called Chennoor to protest against the newly constructed bund with Mr. Mathew Thottakath as the Chairman and Mr. Augustin Panachikal as the Secretary. According to the Chairman and Secretary, over one lakh people of the weaker sections of society engaged in brick making, fishing, ferry service and boat traffic have been affected by the construction of the bund. There were hundreds of people who made a living by collecting sand from small branches of the Periyar and selling it to the people in cities. The rise in effluent concentration threatened aquatic life and fishes were found dead on a large scale. More over, Varapusha, Cheranallore and Kadampady where prawn culture was carried out extensively, industrial effluents caused large scale destruction to these shrimp fields. The bund also obstructed the free passage of country crafts up and down the river. Many of the weaker sections of society engaged in brick making in islands like Muttinakan, Mannanthurutha, Kloor, Manjummel, Cheranallore, Varapusha, Idampadam, Thundathunkaduva, Chariyankuruthy, Chennur, Karikkattuthurutha, Kothadu, Kandanda, Karambadam,

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\*pH value Term used to express the degree of acidity or alkalinity of a substance. Below a reading of 7pH, the substance is acid. Above a reading of 7pH, the substance is alkaline.

Pizhala, Moolampilli and Chaliyamthuruthy were affected financially as a consequence of the newly constructed bund. Following are the figures put forward by Periyar Bund Action Council (Information collected through personal discussions with the Chairman and Secretary of the Council).

1. No. of people who lost jobs (people engaged in transport, loading and unloading of sand, bricks, etc.)	..	19,500
2. Area of shrimp fields facing threat of water pollution due to bund	..	20,000 acres
3. No. of country boats idling as a result of the bund	..	2,338
<u>Losses in terms of rupees</u>		
a) Loss due to stoppage of navigation by country boats	..	Rs.40,760
b) Loss of sales of clay for brick making	..	Rs.27,40,000
c) Loss of rent due from brick manufacturing sites	..	Rs. 4,11,000
d) Loss due to non-availability of I.R.D.P. loan from banks	..	Rs.79,85,000*

4.3.6 On April 20th 1982, a meeting was organised at Pizhala by the newly formed 'Periyar Bund Action Council' inviting Panchayat Presidents, Parish Priests, local leaders

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\*Loss due to non-availability of I.R.D.P. loan from banks as quoted by the President of the Council seems to be exaggerated since the disbursement of I.R.D.P. loan during the period 1981-1982 for the entire Kerala State was Rs.2,274.47 for 96,882 families (Economic Review, 1982, p.61).

political leaders, village representatives and trade union leaders of various organisations to voice their opinions on the issues involved as a result of the bund. It was decided that a meeting be held on 23rd April 1982 to discuss demands and strategies to be used for achieving their objectives.

On 23rd April 1982 at 6p.m. the representatives of the Council and others assembled at the 'Kothad Vayana Sala' to work out a plan of action.

4.3.7 Demands, protests and strategies: As decided on 23rd April 1982 the Periyar Bund Action Council resorted to a pre-test demonstration on 26th April 1982 against the newly constructed bund. The mob was even ready to demolish the bund, but the police intervened and many of them were arrested. A dharna was conducted on 29th April 1982 at 3p.m. in front of the Fertilizers and Chemicals Travancore Ltd. to demand compensation from the management for loss incurred as a result of the bund. Later a memorandum was submitted to the Governor of Kerala by the office bearers of the Periyar Bund Action Council. The memorandum submitted to the government demanded that:

- (1) the bund be demolished to facilitate easy passage of boats,
- (2) an assurance be given that no bund be built across the river blocking the passage, and
- (3) the labourers who had been rendered jobless by the bund be paid compensation.

Accordingly the agitation was called off when they received assurances from Ministers and senior officers concerned that action would be taken on the memorandum the council had submitted to the Governor.

4.3.8 Present state of affairs: On the noon of June 3rd 1982 the bund was completely washed away by floods, thereby restoring complete normality to the flow of Periyar river. The Periyar Bund Action Council, an adhoc task oriented group formed for certain specific purposes, faded away with the natural disappearance of the bund during the heavy rains.

4.4.0 Case Study No.II : Farmers' Protest Against a Chemical Industry

4.4.1 Background: The Kerala Chemicals and Proteins Ltd., or the Ossein factory as it is popularly known, is an Indo-Japanese joint venture, situated at Kathikudan, a village four kilometres off Koratty in Kerala. It is a Rs.3.2 crore project having an employment potential for 93 employees. The plant is licensed to manufacture annually 2,210 tonnes of ossein and 4,250 tonnes of dicalcium phosphate. Ossein is an intermediate product in the manufacture of gelatine. Gelatine has wide and varied uses in the manufacture of photographic films, foods and pharmaceutical capsules. Dicalcium phosphate is used as an ingredient in animal and poultry feed, fertiliser and pharmaceutical preparations. The raw materials for the

plant are animal bones, hydrochloric acid and lime. It consumes about 10,000 tonnes of animal bones, 10,000 gallons of hydrochloric acid and 2,000 tonnes of lime per annum. About 6,000 tonnes of finished products go out of the factory every year.

4.4.2 Nature of the problem: The effluent treating system in Kathikudam consists of two settling tanks and eleven natural digestion ponds called lagoons. The effluent from the plant is taken into the settling tanks where most of the suspended solids and floating material get settled. From the settling tanks the effluent passes through eleven digestion ponds before it goes through a pipe into the Chalakudy river. However, in 1975, just four months after commencement of production in the plant, complaints started <sup>in</sup> during/almost simultaneously about the withering of paddy and coconut palms in the neighbourhood. Since the settling tanks are not lined, the effluents had seeped out and affected the drinking water of the nearby wells. Phosphates and chlorine are the main effluents of the factory.

4.4.3 No organised group efforts to register protest against the company had taken place in the area in spite of a general feeling that the effluents from the company was polluting the drinking water and damaging the plants in the neighbourhood. However, there were individual efforts to submit memorandum to the management of the company and giving publicity

to the nature of problems caused the pollution by the company. The company could settle the problem individually by providing compensation to the extent of the damaged areas and/or by providing pipe borne drinking water. According to the affected locals, the management of the factory did not take voluntary steps to eliminate the problem without getting a complaint. It was only on the receipt of complaints, action was taken by the company to supply fresh water to the people whose wells were polluted.

**4.4.4 Response of the management:** In 1980 the factory paid a compensation for 1.92 acres of paddy crops damaged, but the claim of the damaged area increased to 3.2 acres in 1981. The company agreed to pay compensation to the damaged area at the rate of Rs.21.75 per cent. In addition, the factory agreed to provide water supply through pipes from its own water tank to 16 nearby families, whose wells were contaminated. There were claims by large number of farmers and local residents for compensation. According to the management of the company, such claims were resolved only after inspecting the affected areas.

**4.4.5 Present state of affairs:** Since the Namia Chemicals and Proteins project is facing pressure from the local people, the management of the factory intends to treat the effluents, so that the water would ultimately be potable. The National Environmental Engineering Research Institute based in Nagpur

sent a team to visit the factory and to conduct initial testing of the effluents and to inspect the affected areas. The Institute has been entrusted with the entire problem of the effluents and with recommending a suitable solution to the problem. The team is expected to give a detailed engineering scheme for the treatment of effluents to the satisfaction of the local residents.

#### 4.5.0 Case Study No. III : A Panchayat Against Radiation Pollution

4.5.1 Background: The Indian Rare Earths Ltd., a public sector/<sup>unit</sup>of the Government of India is located at Udyogmandal on the banks of the river Periyar. The major products of the factory are Rare Earths Compounds, Tri-sodium Phosphate and Thorium compounds.

4.5.2 Nature of the problem: In 1981 January, the management of the factory took a decision to bury the waste emanat-<sup>from</sup>ing in/ the process of manufacture of thorium containing radio active lead sulphide in concrete containers in the factory premises.

4.5.3 The Eloor Panchayat passed a resolution object-<sup>to</sup>ing/the decision of the management of Indian Rare Earths to bury waste containing radio active lead sulphide in the factory premises, because of its possible consequence to the health of the inhabitants of the locality. A copy of the

resolution was also sent to the management of the factory. Despite all the reminders, the management of the company proceeded to implement their decisions as they did not perceive any health hazard in implementing their decision. Moreover there was no other alternative in disposing the radio active waste. In the petition presented to the management of the company the panchayat had stated that the scientists working in the factory itself had expressed the opinion that the radio active waste materials would pollute the subterranean water in the area of at least 25 kilometres radius (Indian Express, January 18, 1981, p.5). A meeting was convened on 21st January 1981 at the Panchayat Office with persons from different political parties to express their alarm on this matter. Besides, the Bhabha Atomic Research Centre at Bombay which is a competent authority to give opinion on the matter had stated that poisonous particles of thorium, lead sulphide and uranium, even though preserved in concrete containers and buried underneath the earth, would have far reaching and complicated consequences (Indian Express, January 18, 1981, p.5). The Management of the company did not take any alternative step nor did they desist from their earlier decision and as a result the Eloor Panchayat filed a writ petition <sup>before</sup> / the Kerala High Court with a request to prevent the public sector Indian Rare Earths from disposing radio active waste in the factory premises. The Kerala High Court admitted the writ petition.



4.5.4 Reactions of the management: According to the management of the factory, they have a well-equipped effluent treatment system and hence do not pollute the place. Being a chemical factory, they do have effluents, but they are properly treated as per Indian Standards. As for the writ petition filed by the Eloor Panchayat challenging the action of the management in disposing radio active wastes, which is a health hazard to local people the Management was willing to present its case with facts and figures to prove that effluents discharged by the company including radio active waste materials are as per International Standards.

4.5.5 Present state of affairs: The President of the Eloor Panchayat who took the initiative to approach the management of the company also expressed his view that there was no support from the local people primarily because of the fact that majority of the residents were employed in industries located in the Eloor-Kalamassery area. In the absence of group support from the local people no positive action can be taken by the local panchayat for protecting the environment from pollutants generated from the local industries.

4.6.0 Case Study No.IV : Local People Against Pollution Caused by the Effluents of Hindustan Paper Corporation

4.6.1 Background: The Hindustan Paper Corporation, a Rs.152 crore project of the Government of India, is located at

Velloor. It has an annual capacity of 80,000 tonnes of news print and is capable of turning out a kilometre length of paper, seven metre wide every minute. The 4 crore effluent treatment outlet is located just below Piravom railway bridge across the Moovattupusha river. The Moovattupusha river is one of those few rivers in Kerala which was gifted with clear water throughout the year before the establishment of the Hindustan Paper Corporation. The people of Velloor, Vaikom and other nearby areas depend on this river even for drinking purposes. With the establishment of Hindustan Paper Corporation the river has been subjected to the perils of industrial pollution.

4.6.2 Nature of the problem: The local people of Velloor, Vaikom and nearby areas objected <sup>to</sup> the decision of <sup>the</sup> Management to pump the effluents into the Moovattupusha river. Their demand was that the Hindustan Paper Corporation should siphon the effluents out into the sea directly through pipelines rather than letting the effluents directly into the Moovattupusha river. The management of the concern made a preliminary survey for laying a pipeline for discharging the effluents into the sea. Experts approved the scheme prepared as feasible but unfortunately the management of the factory discarded the scheme because of the cost involved in the project. A movement of the local people to protect their interest started expressing their reactions through dharna,

satyagraha, etc. The movement was known as the 'Moovattupuzha Malineekarana Virudha Samara Samithi' with Mr. K.S.Gopalan as its President and this organised samithi came into existence towards the last week of May 1981.

4.6.3 Demands, protests and strategies of the samithi: The people of Vaikom and nearby areas sent frequent memoranda to the Hindustan Paper Corporation authorities and also to State and Central Governments. On April 8, 1981 about 500 volunteers representing the local people of Vaikom taluk staged a dharna in front of the Kottayam Collectorate to protest against water pollution. Another memorandum was submitted to the late Prime Minister Mrs. Indira Gandhi on behalf of more than 3 lakhs of people inhabiting Vaikom and Kanayannoor Taluk. This was followed by a march to the factory by a large number of people towards the end of May 1981. A Committee called the 'Moovattupuzha Malineekarana Virudha Samara Samithi' was formed and it urged the State government to order a study to find out the number of people using the river water and also to implement drinking water supply schemes to the various localities which do not have the facility. On December 10, 1981 hundreds of people of Vaikom and nearby areas rowed up the river to the Hindustan Paper Corporation to protest against water pollution. A writ petition was filed by the Moovattupuzha Malineekarana Virudha Samara Samithi at the Kerala High Court to restrain the Hindustan Paper Corporation in discharging the effluents of the factory into the river.

**4.6.4 Reactions of the management:** According to the management of the Hindustan Paper Corporation, nearly Rs.4 crores have been earmarked for effluent treatment in order to keep the pollution load within limits. The effluent treatment system was designed by Canadian Consultants who had rich experience in designing and implementing effluent treatment systems in the United States and Canada. Besides, the facility at Hindustan Paper Corporation was confirmed to Indian Standards Institution and the Water Pollution Control Board. The management of Hindustan Paper Corporation also alleged that it was the local politicians with vested interest who were responsible for creating unrest among the local people by indulging in wrong propoganda on the characteristics of the effluents discharged. According to the management the demand by the local people that the effluents should be pumped into the sea directly through pipelines was not practical due to the cost involved in the project.

**4.6.5 Present state of affairs:** The agitation by the 'Anti-Pollution Action Committee' at Meovattupuzha subsided with the assurance from the State Government that effective steps would be taken to ensure proper treatment of the effluent from the Velloer newsprint factory before they were discharged into the Meovattupuzha river. The Water Pollution Control Board assured that it would keep track of the effluents discharged and ensure purity of the Meovattupuzha.

**4.7.0 Case Study No.V : Environmental Protection Demands in Eloor-Kalamassery Area**

**4.7.1 Background:** There are eight major industrial concerns in the Eloor-Kalamassery area. Most of the industries are located on the banks of the river Periyar from which they have their fresh water intake. The concentration of chemical industries in the area has contributed to air and water pollution. Besides the concentration of industries in the area, agricultural operations are also carried out on a small scale in this area. The chief crops cultivated are paddy and coconut.

**4.7.2 Nature of the problem:** On the morning of September 2nd 1983, local people of Eloor-Kalamassery area reported difficulty in breathing and also watering of their eyes with a burning sensation. Forty residents of the Eloor area had to be hospitalised after inhaling poisonous gas. The gas which enveloped the Eloor area for an hour affected a large number of cattle and 700 acres of crops in the nearby Eloor and Alangode villages. Individual complaints put forward to District Collector who visited the affected areas, pointed out that the top of the crops was scorched because of the gas. He ordered an enquiry into the source of the gas that affected men, animals and crops. Individual complaints to the management of a specified chemical unit was impossible, since the concentration of chemical units in the area made it difficult

to locate the exact chemical unit responsible for the gas incident on the morning of September 2nd 1983. On several occasions the City of Cochin was covered with thick smog and local people assumed that the discharge of gaseous pollutants by the chemical industries in Eloor-Kalamassery industrial belt contributed to health problems of men, animals and plants in the area.

**4.7.3 Individuals and groups : Demands, protests and strategies:** Most of the environmental movements in the Eloor-Kalamassery area are individual movements or by groups affected by the pollution problem. In 1981, in front of the Indian Aluminium Company, a group of local people started an agitation for proper pollution control. This was followed by a hunger strike on July 1st, 1981. Frequent memoranda were sent to the Ernakulam district authorities by affected individuals of the locality requesting the State Government to see that the industries in the Eloor-Kalamassery industrial zone adopted proper measures to prevent air and water pollution in the area. As for the gas incident of 2nd September 1983, memoranda were sent to the District Collector by farmers of the locality. In view of the thick smog that covered Cochin city on several occasions, a writ petition was filed at the Kerala High Court by two residents of Cochin namely C.S. Damodaran Nair and T.P. George pleading <sup>before</sup> the High Court to direct the State government to take steps in controlling air pollution in Cochin city.

4.7.4 Present state of affairs: It is strange and interesting to note that in spite of the fact that Kloor-Kalamassery area is a heavily polluted area in Kerala by the presence of a large number of chemical industries, there was no organised movement to protest against industrial pollution. Nor was there any environmental protection group as a part of a larger organization such as Kerala Sastra Sahitya Parishad to organise local units. It is true that there were a number of seminars and conferences at Cochin to discuss environmental pollution in Kerala in general terms without specific action programmes to control industrial pollution in this area. Perhaps the only exception to this was the initiative taken by the Kloor Panchayat against radiation pollution caused by Indian Rare Earths and which did not get adequate local support in their action programmes. Most of the protests against individual companies are by certain affected individual farmers but without any collective efforts. Lack of collective group efforts could be due to several reasons. Most of the local people are directly or indirectly beneficiaries in the form of being employed in these companies. Moreover it was difficult to identify a single agent responsible for air and water pollution in the area as there are many chemical factories located on either sides of Puriyar river. These two major factors are the reason for the absence of organised collective efforts against industrial pollution in the Kloor-Kalamassery industrial area. The incident that occurred on

September 2nd 1983 made it difficult to locate the exact chemical unit responsible for the gas leakage. The District Collector sanctioned compensation for the farmers of Eloor area from the Agricultural Relief fund since the factory responsible for the damage could not be located.

4.7.5           The two writ petitions filed by 2 residents of Cochin at the Kerala High Court are pending <sup>before</sup> / the High Court. However, Cochin area is the centre of holding seminars and conferences on environmental pollution and a centre for activating environmental protection groups like Friends of Trees, Kerala Natural History Society, Malabar Fauna and Flora Society, etc.

4.8.0     Case Study No.VI : The Gwalior Rayons at Mavoor and the Chaliyar River

4.8.1     Background: The Gwalior Rayon Silk Manufacturing Company is located at Mavoor in Calicut district. The company began production in 1958. The main products of the company are wood pulp, fibre and staple/<sup>fibre.</sup> In 1963, individual protests were put forward against the factory for water pollution. The management agreed to minimise water pollution by discharging the effluents directly into the sea through a 20km. long pipe line by 1966 and to dig wells in the affected villages. The people organised protests in 1965, 1967, 1968 and 1973 since the management did not make arrangements



for treating its effluents. In 1974, the State Government called a tripartite meeting inviting representatives of the local people, the factory management and the newly formed Kerala State Water Pollution Control Board to voice their opinions on the issue. During this meeting the management agreed to discharge the treated effluents at Chungapalli, a brackish water stretch 7 km. downstream from the factory. Several years passed by and the factory did nothing. In 1979, a team sponsored by the Kerala Sastra Sahitya Parishad conducted a study to determine the effects of pollution. Its report concluded that "the present arrangements for the treatment of the effluents are absolutely inadequate. The problem of pollution persists in the area mainly because of the callous indifference of the factory management to employ, the already available know-how for effluent treatment" (A citizen's report, 1982, p.27). Thus in the summer of 1979 the Gwalior Rayons factory at Mavoor gained wide publicity as a consequence of protests by various groups and associations against environmental degradation caused by the direct discharge of the effluents into the river Chaliyar.

**4.8.2 Nature of the problem:** The management of Gwalior Rayons factory had made arrangements for the discharge of the effluents of the factory through several outlets directly into the river Chaliyar. In September 1979 the residents in the nearby locality observed thick black effluents in the river.

It was also observed that several drinking water wells in the area ceased to be potable because of the seepage of effluents from the factory's pipeline. Several memoranda were presented to the management of the factory concerning the death of buffaloes after drinking the polluted water. Dead fish in large scale was also frequently observed in the river. Even the lime shells for sale were found unsafe as they emitted an unusual foul smell. Cases of skin diseases were found common in the area. Besides water pollution, there were complaints of air pollution too, for mango and cashew trees in the nearby area were found sterile in yielding fruits. Nearly eight panchayats were affected by water and air pollution problems. The local people complained that they were unable to breathe fresh air or drink pure water, besides suffering from skin diseases, loss of buffaloes and loss of yields from plants and trees.

4.8.3 In late 1979, reports of the detection of Mercury in the effluent caused alarm in the region. It was found that Kalpally 1.6 km. away from the factory and the entire stretch of the water downstream was found to be contaminated (Indian Express, September 12, 1980). Though the company denied the reports, they were confirmed by the State Minister of Health and the Water Pollution Control Board. In November 1981, the Board sued Ovalior Rayons for discharging its effluents through illegal outlets and dumping it into the

Chaliyar without proper treatment. In the early 1982s a study commissioned by the Department of Science and Technology confirmed the presence of lead and other heavy metals in amounts exceeding the prescribed levels for the effluents. (A Citizens Report, 1982, p.27). Prof. K.M. Unnikrishnan of St. Joseph's College at Devagiri, Calicut also analysed a sample of discharged water and found that it contained elements of Mercury. Another study by the Chemistry Department of Calicut University also confirmed the presence of heavy metals in the Chaliyar river (The Hindu, April 3, 1982). A case was filed by the Public Health Engineering Department authorities seeking an order to restrain the factory from discharging untreated effluents into the Chaliyar river.

4.8.4 Demands, protests and strategies of environmental protection pressure groups: Following the public awareness of the problem with confirmation of water pollution by the studies of Prof. K.M. Unnikrishnan, Department of Chemistry, Calicut University; Department of Science and Technology and Water Pollution Control Board, there was spontaneous resentment expressed through agitations by various groups. The residents of Kayalam and other villages in Calicut joined with Congress Volunteers to protest against pollution of Chaliyar river. Various student groups staged a dharna in front of the Calicut Collectorate demanding a permanent solution to the problem of air and water pollutions. A joint action committee of people

was formed at Mavoor consisting of villagers, social workers and environmentalists under the title 'Parisara Samrakshana Ekopana Samithi' in order to restrain the Gealior Rayons factory from re-opening the unit until the required machinery was set up to treat the effluents of the factory. In the first week of January 1982, the Collectorate at Calicut was picketed by the Joint Action Committee. The villagers residing on the banks of the Chaliyar river broke the effluent pipeline of the factory at a site about one kilometre from Chungappalli, the discharge point. Later, in November 28, 1982 a dharna was staged in front of the factory and a memorandum was submitted to the management of the factory enlisting a number of demands to be met within 15 days. This was followed by an indefinite agitation with a relay fast at the main gate of the factory. About 100 volunteers participated in the satyagraha demanding immediate relief to the problem of pollution. This local pressure group created an awareness of the dangers of industrial pollution and so other voluntary organisations such as 'Society for Protection of Environment Kerala' and the environmental group of the 'Kerala Sastra Sahitya Parishad' came forward to support the agitation against the company. In fact the environmental group of Kerala Sastra Sahitya Parishad had joined the Parisara Samrakshana Ekopana Samithi much earlier and had conducted a four days padayathra from April 26th to April 30th, 1982 in order to enlighten the residents on the danger of air and water pollution in Mavoor. A health survey

and a medical camp was conducted by the Committee in the villages surrounding the Chaliyar river. These environmental protection pressure groups organised seminars, public meetings and gave wide publicity of the problems through news media. As a result of publicity, the issue was not confined to a small area by a small group, but became a focus of attention of people throughout Kerala.

4.8.5 A new association was also established as a consequence of this development. A 'Committee for the Advancement of Legal Literature' was established in order to provide free legal assistance to people ready to file petitions to court. A number of writ petitions were filed at the Kerala High Court <sup>with</sup> / the help of the Committee for the Advancement of Legal Literature. A suit was also filed by the 'Parisara Samrakshna Ekopana Samithi' requesting that the Mavoor Rayons unit be restrained from re-opening until it had installed machinery to treat the effluents. The petitioner contented that at the meeting held at Trivandrum neither the representation of the people <sup>of</sup> / the members of State Board for Prevention and Control of Water Pollution was present. Another suit was filed by the affected villagers before the Principal Subordinate Judge. The suit sought an order to direct the defendants to block permanently and securely all the outlets through which the effluents were discharged into the river with the exception of those that are legally permitted.

4.8.6 Reactions of the Management: According to the management of the Gwalior Rayons, the allegations of the local people that the company was discharging effluents through unauthorised outlets was misleading. The effluents of the factory were according to standards prescribed by the Water Pollution Control Board. To make matters worse, the local people had broken the effluent pipeline at a site about one kilometre from Chungappalli and effluents were leaking out of the opening, submerging the neighbourhood. The officials of the company who went to investigate the damage were gheraoed by the local residents. Roads to the factory were blocked by the local people and some of the telephone lines were also cut. The management was forced to close the factory since the broken effluent pipelines would take at least 45 days to repair.

4.8.7 Present state of affairs: The State Government directed the Gwalior Rayons factory to complete the work on an effluent treatment plant before April 30th 1983. The Kerala High Court recently passed severe strictures against the company (A Citizen's Report, 1982, p.27). The agitation was called off after the effluent pipeline was repaired and with an assurance from the government that the Water Pollution Control Board would keep a 24 hour vigil on the treatment works at Gwalior Rayons.

4.9.0 Case Study No.VII : The Silent Valley Protection Movement

4.9.1 Background: The Silent Valley is situated . . . 43 km. north of Mannarghat, Palghat district in Kerala State. It contains India's substantial stretch of tropical evergreen forest and is the only vestige of virgin forest in the whole of Western ghats. The area remained virgin for ages because it was impenetrable. It is surrounded by mountain ridges, rendering it rather inaccessible and the tiny river flowing through its length endows the area with a luxuriant flora and fauna. Tropical rainforests are the highest form of vegetation existing in the world today. Scientists refer to them as the 'climax' from the evolutionary peak in plant life. Such forests contain rich varieties of living species. There are no human inhabitants in the 8,950 hectares that form the silent valley proper. The absence of cicadas - a species of insects emitting sound of a special nature - renders a peaceful and solemn atmosphere and hence the valley derived its present name "Silent Valley". The Silent Valley is surrounded by the Attappady Reserve Forests on the one side and New Amarambalam and Kunda Reserve Forests on the other. The total area of the above forests aggregate to nearly 39,000 hectares (Richards, P.W., 1964, p.5). It is important for the survival of a number of endangered species like the "Macaca Silenus" or the lion tailed monkey. The importance of this <sup>species</sup> lies in the fact that it is the only true arboreal or tree dwelling monkey.

4.9.2           **The Silent Valley Hydro Electric Project of the Kerala State Electricity Board was planned as a multi-purpose project catering to the generation of electric power and for the irrigation of land for agriculture. This project was designed to add 240 MW to the installed capacity of 101 MW of power in the State of Kerala (Itty Darvin, 1980, p.5). It was also expected to irrigate 10,000 hectares of land in Palghat district.**

4.9.3           **History of the project: The decision to construct a dam across the Kunthipusha river, a tributary of the Bharathapusha and to harness the waters to generate hydro-power was conceived as early as the 1920s. With the states reorganisation in the year 1956, the Silent Valley area which formerly belonged to Madras State became a part of the State of Kerala. The Kerala Government decided to implement the project planned in 1920s because of its multiple advantages and the revised project was sent for approval to the National Planning Commission in 1973. The project was approved and in the very same year work on the project began. In 1976 the National Committee on Environmental Planning and Co-ordination on the ecological planning of the Western Ghats intervened with recommendations to abandon the project and declare the area a biosphere reserve (D'Monte Darryl, 1983, p.35). However, the committee laid down several safeguards if the government**



felt the project could not be abandoned for any reason. The Kerala government was prepared to proceed with the work on the project, with assurance to abide by all the safeguards recommended by the Committee.

4.9.4           The Kerala Government was prevented from continuing the work on the project because environmentalists, scientists, international and national environmental groups opposed the project on the ground of the possible ecological imbalance to the Silent Valley area. Implementation of the project was further delayed due to certain political changes in the country and in 1979 Mr. Charan Singh who succeeded Mr. Morarji Desai as the Prime Minister of India recommended that the Kerala Government stop further work on the project. In October 1979, the Central Government decided to send the country's most famous agricultural scientist, Dr. M.S. Swaminathan who was the then Secretary to the Union Agriculture Ministry, to give his opinion on the environmental consequences of the proposed project. Similar to the National Committee on Environmental Planning's recommendations, Dr. M.S. Swaminathan concluded that the entire area of the Silent Valley and its environs - a total of 40,000 hectares - be converted into a rain forest biosphere reserve (D'Monte Darryl, 1983, p.36).

4.9.5           In April 1980, a seminar was organised at Trivandrum at the initiative of the Government of Kerala inviting scientists, environmentalists and others to voice their

opinions on the issues involved in the implementation of the Silent Valley Hydro Electric Project. The Seminar was chaired by Dr. A. Abraham, Chairman of the Kerala State Committee on Science and Technology. The seminar was a failure, for the participants could not arrive at a concensus on the various issues involved. In August 1980, the new Government at the Centre under the Prime Ministership of Mrs. Indira Gandhi convened a meeting to discuss the Silent Valley issue with the Chief Minister of Kerala Sri E.K. Nayanar. It was decided that a Committee be set up under the Chairmanship of Professor M.G.K. Menon, the Secretary to the Department of Science and Technology in Delhi. The Committee constituted for the purpose consisted of four members nominated by the Kerala Government and four members nominated by the Centre and Prof. M.G.K. Menon as the Chairman. The joint committee headed by Prof. M.G.K. Menon prepared a consolidated draft report, outlining the various issues arising out of the discussions, field visits, presentation by specialists as well as <sup>the</sup> <sup>the</sup> investigations conducted by the study teams such as <sup>the</sup> <sup>the</sup> expert committee appointed by the State Government prior to the appointment of the joint Committee by the Central Government, Zoological Survey of India and Botanical Survey of India. The Expert Committee of the Government of Kerala found that the Sabarigiri and Attappadi forests are richer in respect of flora and fauna elements and the overall species diversity is higher in the Sabarigiri forests. On the other hand the findings of

the Zoological Survey of India was that both in terms of species abundance and numerical richness the Silent Valley presented a unique picture. The limited explorations by the Zoological and Botanical Surveys of India have resulted in the discovery of four new species of amphibians, three new species of fish, one new genus and five new species of membranid bugs, one new species of beetle, two new species of water skaters, one new species of spider, one new sub-species of scorpion, three new species of lichens, three new species of mosses, one new species of fern, eight new species of angiosperms, a new genus of grass and a new species of brambusa (The Hindu, June 20th, 1983).

4.9.6 The Joint Committee quoted all these findings with much emphasis on the observations of the Zoological Survey of India and the Botanical Survey of India. The members of the joint committee could not arrive at a final conclusion whether the project would cause significant ecological damage or not. However, Prof. M.G.K. Menon recommended that the project need not be considered for the next 20 years, as there were differing views on the ecological aspects among the members of the joint committee. The Prime Minister Mrs. Indira Gandhi favoured the recommendations of Prof. M.G.K. Menon.

4.9.7 The Central Government did not provide clearance for the Silent Valley Hydro Electric Project in the light of the controversy and the recommendations made by

Prof. M.G.K. Menon. The Centre repeatedly gave a suggestion to convert the entire area including the hydro project area to a national park. The first notification declaring Kerala's intention to constitute 8,952 hectares of Silent Valley forests as a national park was issued during the President's rule. But within a month after the Ministry headed by Mr. K.Karunakaran assumed office, an erratum notification was issued excluding 845 hectares for setting up the hydel project. The Central Government claimed that it did not give permission for the exclusion.

4.9.8 Demands, protests and strategies of the environmental protection groups: The Silent Valley hydro electric project was neither an unusual nor a spectacular one, for it belonged to the family of multipurpose projects designed to generate hydro electric power and irrigation of land for agricultural operation. However, it attracted, for the first time in the history of any hydel project within the Indian sub-continent, the critical attention of the scientific community in the country. Many nature lovers and scientists in India and abroad raised protests against the implementation of the project on the basis of assumed or projected environmental imbalance to the Silent Valley area.

4.9.9           The two main opponents of the scheme in Kerala were the environmental group of the 'Kerala Sastra Sahitya Parishad' and the 'Friends of the Trees' an association for the protection of trees. A committee was set up simultaneously in Bombay called 'Save Silent Valley' which got support from the individuals belonging to the 'World Wild life Fund', the 'Bombay Natural History Society' and the 'Save Bombay Committee'. Various international bodies provided considerable support to save the Silent Valley, the most prominent of them being the 'International Union for Conservation of Resources' in Switzerland, which, at its conference in Ashkhabad in the U.S.S.R. in September 1978 called upon the Kerala Government to abandon the project. Besides many foreign scientists and experts in tropical rain forests, zoologists and botanists in India provided concrete data to support conservation of the Silent Valley area. The International Union for Conservation of Resources (IUCR) offered £10,000 to help the task force appointed by National Committee on Environmental Planning and Coordination as part of its international campaign to save rain forests.

4.9.10           Nearly a score of heavily documented pamphlets were published by the environmental groups in India when the National Committee on Environmental Planning and Co-ordination demanded on the basis of the research report that the project be abandoned. Scientists, teachers, students, technocrats

and the intellectual middle class as a whole were made aware of the ecological imbalance ~~to~~ the Silent Valley. Many environmental groups came forward to object <sup>to</sup> the Kerala Government's proposal to implement the project. The Volunteers of Kerala Sastra Sahitya Parishad particularly Prof. M.K. Prasad of Maharaja's College in Cochin; Dr. K.N. Raj of the Centre for Development Studies in Trivandrum and a prominent Kerala Sastra Sahitya Parishad worker Dr. M.P. Parameswaran voiced their opinion on the ill effects of the Project at a Seminar conducted in April 1980 in Trivandrum.

4.9.11 Two cases were filed in the Kerala High Court one by Mr. Joseph John of the Friends of Trees and another by Mr. R.K. Ramesh and Mr. M.K.N. Potty of the Society for Protection of Silent Valley. In both cases the Kerala High Court dismissed the petitions stating "but in this region we cannot substitute our judgement for that of the Government, on the question as to whether a national asset is to be more conveniently utilised as a hydro-electric project with prospects of greater power generation, or retained in its pristine glory or preservation of forests and wild life, prevention of soil erosion and avoidance of other deleterious effects on the community" (Prasad, M.K., 1984, p.129).

4.9.12 However, through a series of meetings and publications, these environmental protection groups could create an awareness in the minds of the public on the undesirability of

implementing the Silent Valley Hydro Electric Project by the Kerala State Electricity Board and the State Government. During this period there were a number of counter pressure groups favouring the decision of the government. Prominent among them were Kerala State Electricity Board and local associations in Mannarghat demanding the implementation of the project for the benefit of the farmers in the area. Throughout this controversy no political party was directly involved, though unofficially individual members were permitted to express their views as individuals. In fact, Dr. M.P. Parameswaran, a prominent worker of C.P.I (M) and a number of other workers of Kerala Sastra Sahitya Parishad belonging to the Marxist Party were not given any official support.

4.9.13 Present state of affairs: The controversy on Silent Valley subsided with the decision of the Central Government not to give sanction for the Silent Valley Hydro Electric Project for the next twenty years on the basis of recommendations by Prof. M.G.K. Menon. The Government of Kerala accepted an alternate plan to divert Kuthipuzha Water through a tunnel to a region at a lower level and create a reservoir there. The Government of India had given a suggestion to convert Silent Valley area into a National Park. Now the controversy surrounding Silent Valley has subsided for the time being with the abandonment of the project for the next 20 years. According to Prof. M.K. Prasad the issue is likely to arise after 20 years.

#### **4.10.0 Conclusions**

**4.10.1** A detailed observation and analysis of the case studies quoted above show certain common characteristics.

**4.10.2** Except the Silent Valley most other issues were confined to a local area with or without support from environmental groups or associations from other areas.

**4.10.3** Next to the Silent Valley the case which attracted attention all over Kerala was the agitation against Gwalior Rayons factory at Mavoor.

**4.10.4** Legal verdicts on environmental issues were not in favour of the environmental protection groups, for the court may not be in a position to go beyond existing legal structures and regulation on many aspects involved in such cases.

**4.10.5** There was no support for any one of these environmental protection movements directly and officially from any political party, though individual members were permitted to express their opinions.

**4.10.6** Strange enough the most polluted area in Kerala, the Eloor-Kalamassery industrial belt was not very active by the programmes of environmental protection groups. It could be possible that the pollution was caused by several units and no unit could be identified as the culprit except Indian Rare Earths' factory for radiation pollution.



4.10.7 Most of the groups originated in the local area on the occurrence of a specific issue and the attention was directed against a perceived agency responsible for the observed pollution. This was the case at Mavoor against the Gwalior Rayons factory; Velloor against Hindustan Paper Corporation and at Chalakudy against the Kerala Chemicals and Proteins Ltd.

4.10.8 Even an initiative taken by a local administration, namely a panchayat against Indian Rare Earths factory for radiation pollution did not find adequate support from the local inhabitants or other environmental protection groups.

4.10.9 Except in the case of Silent Valley and Mavoor Rayons, the environmental pressure groups - local or district or state level - never made an attempt in influencing legislature, the ministry, the local government or government departments responsible for pollution control. The direct agitations against management causing environmental pollution without influencing higher level decision makers in the government or political parties are not likely to succeed in our present set up and this is supported by the fact that in many cases management was not ready to abide by all the demands. However in certain cases the management tried to appease individual members by offering compensation and other benefits to certain people.

4.10.10           The case studies on the whole show the failures of environmental protection pressure groups with the management of industrial concerns, as well as with legal remedies.

Failure of environmental protection pressure groups in their attempts at influencing the management of local units, needs further exploration by detailed studies on this phenomena.

4.10.11           In spite of all the limitations and failures, these voluntary associations and spontaneous groups for environmental protection have created public awareness on the need to maintain environmental hygiene and the dangerous effects of industrial pollution.

**CHAPTER - V****5.0.0 REGULATORY FRAMEWORK AND ENVIRONMENTAL  
LITIGATIONS****5.1.0 Introduction**

5.1.1 Nicholas Polunin, a noted conservationist, observes: "Enlightened understanding by man of his environment is a pre-requisite to saving it" (Desh Bandhu and N.L. Ramanathan, 1982, p.370). The last twenty years saw the need to study the impact of pollutants and the means by which emissions could be curtailed. We cannot assert with confidence that in developed countries pollution is increasing exponentially, as some observers are inclined to believe (Meadows Donella, 1972, pp.81-94). The quantity of toxic wastes being dumped is hard to measure when significant amounts of such wastes are dumped secretly; but most observers express considerable concern and this is reflected in recent moves to legislate on the environmental effects of highly toxic chemicals (Royal Commission on Environmental Pollution, 1974, p.6). Pollution is a social problem that transcends the artificial boundaries of academic science disciplines. It poses problems for all natural science; largely concerning the identification and measurement of physical impact of pollutants on the environment

including man. Pollution control challenges the engineer who is concerned with pollution control devices and the lawyer who sees the law as a social instrument by which some form of restriction can be imposed on those who cause pollution. Sociologists and other social scientists also do take interest on social problems of pollution. Emergence of groups, associations and/or organisations with the purpose of maintaining environmental hygiene or protesting against environmental degradation caused by industries and other agencies is a recent phenomena with sociological significance. In a pluralistic democratic society, often such social groups and associations are instrumental in pressurising the government for enacting suitable environmental laws and also in resorting to environmental litigation for redressing public grievances caused by environmental pollution.

#### 5.2.0 Role of Government in Controlling Environmental Pollution

5.2.1 Pollution recognises no man-made boundaries, but transgresses city, state or country borders without regard to its origin or man-made interferences. Thus the need for some form of governmental control of the environment is essential to regulate air, water and sound pollution. These forms are based upon some type of well-defined physically established boundaries. They are also based on groups of people who are obliged to perform in accordance with laws and

regulations established within those well-defined boundaries. These laws and regulations differ from government to government and from country to country. What one government might consider to be gross pollution, another government might consider a normal environmental condition. Combatting pollution is a mammoth task, no doubt, but not impossible. The problem is complex, but not without solution.

5.2.2           The local governments such as Corporations, Municipalities and Panchayats can play a significant role in monitoring air and water pollutions and study/<sup>ing</sup>the consequences of pollutants on the health of man, fertility of crops, plants and trees (Environmental Considerations for the Industrial Development Sector, 1978, p.10).

5.2.3           State Government usually has the same or similar social, political and economic interests. At the same time it may be less influenced by or concerned with any one specific environmental problem existing in local areas within its boundaries.

5.2.4           As pollution transgresses state borders without regard to its source, often the problems are to be tackled at the national level by the federal/central government. It is in this context/<sup>that</sup>one makes an observation that most of the legislations for environmental control and environmental protection were enacted by the federal or central government in most of the countries.

5.2.5 Several international agencies are currently involved with environmental issues, either as a principal function or as an important element of their principal mission. Worth mentioning are the World Health Organisation, the United Nations Environment Programme, the World Bank, the International Atomic Energy Agency, National Committee on Environmental Planning and Co-ordination, International Biological Programme, International Union for Conservation of Nature and Natural Resources, International Council of Scientific Unions and UNESCO are such agencies devoted to environmental protection. Matters relating to location of boundaries of sea, air and land, in regard to contaminants, origin of contaminants and joint means of control are of prime importance to these agencies.

### 5.3.0 Role of Pressure Groups in Influencing the Government to Enact Environmental Protection Laws

5.3.1 "The contemporary world has witnessed unprecedented economic growth and technological progress which, while bringing benefits to many people, have also caused severe social and environmental consequences" (Podoinitsia, V.C., 1977, pp.1-6). As a result, the 1960s and 1970s saw a proliferation of environmental protection pressure groups of all kinds. The impact of these groups has raised general public consciousness on the necessity of protecting and preserving the environment. Many of these environmental groups made government and industrial concerns become aware of the quality and quantity to

which environmental deterioration has been carried on. " In their efforts to exert political pressures on governmental and other institutional authorities to make the latter act effectively and with some urgency, environmental pressure groups have scored some significant successes (Bentil Kodwo, J., 1981, p.324). The last few years witnessed a growing concern for the environment. Campaigns to preserve and protect the Bluegum forest in the Cross Valley, Australia, the Friends of the Earth, Sierra Club, World Wild Life Fund, etc., are a few conservationist organisations which have come into existence during the last two decades. There were mass movements especially against nuclear plants and chemical industries which were assumed to be the sources of environmental pollution. These groups have directly or indirectly forced the government from time to time to enact legislations to protect the environment.

5.3.2 In 1962 Rachel Carson's 'Silent Spring' introduced a whole generation to the disadvantages of the highly toxic chemical D.D.T and its lethal effects on man and animals. In 1967 the Environmental Defense Fund and other organisations and individuals in U.S.A. began an anti-D.D.T campaign to influence the government to ban the use of D.D.T. Thus in 1967 and in 1970 a number of states prohibited the use of D.D.T. and its derivatives (Steiner A. George, 1975, p.249). Later, several other persistent chlorinated hydro carbon pesticides were also banned by the U.S. government. According to William Mc Closkey,

Executive Director of the famous Sierra Club, as many as 70 important pieces of legislations have been enacted in the United States of America because of the involvement of the Club. The Endangered Species Act of 1973 was passed as a result of the agitations of the Sierra Club to save certain species of fish from becoming extinct (Economic Scene, 16th July 1983, p.51). Other important environmental legislations such as the Wilderness Preservation Act and the National Environmental Policy Act 1970 were enacted due to the involvement of environmental pressure groups. These groups also paved the way for the establishment of the U.S. Environmental Protection Agency and the Presidents' Council of Environmental Quality (Hodges Laurent, 1977, p.271).

#### 5.4.0 Environmental Legislations - Global

5.4.1 The concept of Environmental Law is incapable of a precise definition. Taking into account all the factors that have contributed to environmental deterioration, Justice Pienberg said: "Noise, traffic, overburdened mass transportation systems, crime, congestion and even availability of drugs, all affect the urban environment" (William Rodgers, 1977, p.1). Environmental law is concerned with the natural environment and the artificial environment. Maintaining a clean healthy environment for human survival and preventing its destruction and deterioration are all the concerns of Environmental law. It is evident that the growth of more industries means good



news to the economy of any country. So more industries means more pollution and more pollution means more harmful effect on the environment. But Environmental Law does not discourage the growth of industries. It aims only at enforcing stipulated norms for the control of environmental pollution. Thus conservation of environment is in the interest of the entire community and, if neglected, could perhaps be the same fate as the people of Hiroshima and Nagasaki.

5.4.2           The concerns of Environmental Law are two-fold, preservation of the environment and prevention of degradation of the environment. Thus any disturbance to the natural environment affecting the living or non-living objects in nature are rectified by the community at large or any individual of the community through the courts of justice. But do the norms of Environmental Law confine to this proposition? The result of conflicting interest is the emergence of two parties: the entrepreneur or the industrialist who worry about more production and the environmentalist who is more concerned with preservation of the environment. It is only natural that in any socio-political system the organized interest which is stronger is always the winner. But this strength of show by numbers, resources or power without a consideration to the common well-being of the society at large, is likely to create further socio-political conflicts and disorganisations. It is in this context one appreciate the relevance of norms and laws for the common well being of the community. Environmental law

and verdict by the courts on issues raised by the concerned parties in conflict - the environmentalists and the industrialist - will determine the quality of our future environment.

**5.4.3 Environmental legislations in the United States of America:** The first major modern legislation was the Water Pollution Control Act, 1948. In passing the Act of 1948, Congress declared it to be the primary right and responsibility of the states to control water pollution. This Act was extended in 1952 and revised in 1956 and again in 1961. Recognising the increasingly serious nature of water pollution, Congress enacted the Water Quality Act of 1965 which permitted the Federal Government to establish water quality standards for interstate waters. The Clean Water Restoration Act of 1966 provided more money for building treatment facilities. The Water Quality Improvement Act of 1970 provided tighter controls over oil pollution and vessel pollution. The Federal Water Pollution Control Act Amendments of 1972 was the first comprehensive legislation to control water pollution.

**5.4.4** The First Federal Law concerning air pollution was the Air Pollution Control Act of 1955, which authorized funds for research. The Clean Air Act of 1963 made available more financial assistance to state and local governments. The Clean Air Act was amended twice, once in 1965 and again in 1966. The 1966 amendments authorized an expansion of the grant-in-aid programme to assist local, state and regional air

pollution control agencies. In 1967, the Congress enacted the Air Quality Act, 1967. The Clean Air Act of 1963 was amended in 1970 which provided the basis for higher standards which are in effect today (Steiner George, 1975, p.248).

5.4.5 As a result of regulating the amounts of pesticide residues the Federal Government enacted certain legislations relating to pesticides. The Federal Insecticides Act, 1910 was enacted to protect farmers and other users from sub-standard or fraudulent insecticides and fungicides. To regulate pesticide residues found in food, the Federal Food, Drug and Cosmetic Act, 1938 was passed. The Federal Insecticide, Fungicide and Rodenticide Act, 1947 provided for seizure of adulterated, misbranded, unregistered or insufficiently labeled pesticides. This act was amended in 1959. The Federal Food, Drug and Cosmetic Act of 1954 provided for condemnation of raw agricultural commodities containing pesticide residues in excess of tolerances fixed by the Secretary of Health, Education and Welfare. The Environmental Pesticide Control Act, 1972 gave Environmental Protection Agency authority to regulate uses of pesticides and to control products sold in interstate commerce.

5.4.6 National solid waste disposal legislation is a very recent legislation compared to air and water pollution. The basic Federal law in the field of solid waste is the Solid Waste Disposal Act of 1965 and amendments to it in the

Recovery Act of 1970. The 1965 Act authorized Federal funds for research, training and state planning. No provision was made for any sort of Federal Regulation or for assistance to build solid waste facilities.

5.4.7 To control and regulate noise pollution, the United States Noise Pollution and Abatement Act of 1970 was passed. The Noise Control Act of 1972 gave the Environmental Protection Agency broad authority to establish noise levels for new motors and engines and for transportation, construction and electrical equipments.

5.4.8 Environmental legislations in the United Kingdom:

Although the first Act containing powers to deal with water pollution appeared in 1388, the first major piece of legislation was the Rivers Pollution Act 1876, which gave power to control pollution in rivers by sewage and industrial wastes. Similar prohibitions are contained in the Salmon and Fresh Water Fisheries Acts 1923 and 1965. The Water Act 1945 makes it an offence to pollute any water used for human consumption or domestic purposes. The Rivers Prevention of Pollution Act, 1951 prohibits the discharge of poisonous or polluting matter into streams, without the consent of the appropriate river authority. The Public Health Act, 1961 gives local councils the power to refuse consent for effluent treatment plants to be connected to their sewers (Brecks Peter, 1974, p-42). Under the terms of the Water Resources Act 1963, river authorities

may control poisonous, noxious or polluting discharges as well as any sewage effluents to an underground stratum by means of a well, bore hole or pipe. The Sea Fisheries Regulations Act, 1966 controls the dumping of detrimental materials into the sea.

5.4.9 The main United Kingdom legislation dealing with pollution of the sea by ship borne oil is the Oil in Navigable Waters Acts, 1955, 1963 and 1971. The 1955 Act had a provision prohibiting the discharge of certain oils into certain sea areas, i.e., into areas designated as 'prohibited zones'. The 1971 Act was further amended following the principle of 'total prohibition' and prohibited the discharge of any oil or oily mixtures to any part of the sea inside the territorial waters of the United Kingdom (McKnight Allan, 1974, p.179).

5.4.10 In 1273 an Act was passed by Edward I to prohibit the use of coal which was detrimental to human health (Agarwal, S.L., 1980, p.192). As a consequence of the 'Great Smog' the clean Air Act of 1956 was passed. This was the first Act dealing with air pollution control. The Clean Air Act 1956 prohibits the emission of dark smoke from all chimneys. The Clean Air Act of 1968 requires that incinerators burning refuse and producing dark smoke, grit and dust be provided with adequate arresting plants to control air pollution.

5.4.11 In Britain there was no statutory control over hazardous wastes till 1972, although a government working party reported on the subject in 1970 (Porteous Andrew, 1979, p.107). The Deposit of Poisonous Wastes Act, 1972 made it an offence to deposit waste on land, or to cause or permit waste to be deposited on land, where the waste was poisonous or polluting and its presence on the land was liable to give rise to an environmental hazard. The Control of Pollution Act 1974 controls the disposal of all domestic, commercial and industrial wastes, excluding agricultural and mining and quarrying wastes.

5.4.12 In the United Kingdom where one fifth of all confirmed nuisances are from construction noise, there are wide ranging and detailed laws (Porteous Andrew, 1979, p.171). The Noise Abatement Act 1960 enables local councils to deal with any noise or vibration which is considered as a nuisance to the community. Other Acts include the Health and Safety at Work Act 1974; the Control of Pollution Act, 1974; the Road Working Machines Regulations, 1974 and the Noise Insulation Regulations 1975.

#### 5.5.0 Environmental Legislations - India

5.5.1 The Indian Constitution is the first Constitution in the world which made provision for the protection of environment (Agarwal, S.L., 1980, p.1). The Constitution Amendment Act, 1971 for the first time, inserted specific provision with

respect to the protection of environment throughout the country. Article 47 provides for the improvement of public health as one of the main duties of the state. Article 48A says "The State shall endeavour to protect and improve the environment and to safeguard the forests and wild life of the country" (44th Amendment of Constitution, 1979). The other provision dealing with the environmental protection finds place in the Fundamental Duties. Article 51 A (g) specifically deals with the fundamental duty of an Indian citizen with respect to environment. It says "It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wild life and to have compassion for living creatures" (44th Amendment of Constitution, 1979).

5.5.2 There are several laws that directly or indirectly relate to the protection of environmental resources. The Bengal Smoke Nuisance Act, 1905 gives the State Government power to prohibit by notification the erection or use of kilns or furnaces or the manufacture of coke in specified areas. A few of the older legislations passed by the government to protect the environment include the Indian Forest Act of 1927, the Motor Vehicles Act of 1939 and the Factories Act of 1948. The Factories Act, 1948 attempts to prevent, protect and promote the health and welfare of workers. Other areas where legislations have been passed include the Insecticides Act of 1968 and the Wild Life Protection Act of 1972.

**5.5.3** Recognizing the serious nature of water pollution, two states of India namely Orissa and Maharashtra enacted legislations for the protection of water bodies. The Orissa River Pollution Prevention Act, 1953 and the Maharashtra Prevention of Water Pollution Act, 1969 were the two state enactments on the subject. The River Boards Act, 1956 provides for the creation of River Boards for regulation and development of interstate rivers and river valleys. The Merchant Shipping Act, 1958 prohibits the discharge of oil or oil mixture by an Indian tanker or ship within the prohibited zone adjoining the territories of India. Other legislations include the Water-Prevention and Control of Pollution Act, 1974 which provides for "the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water, for the establishment, with a view to carrying out the purposes aforesaid, of Board for the Prevention and Control of Water Pollution, for conferring on and assigning to such Boards powers and functions relating thereto and for matters connected therewith" (Water Prevention and Control of Pollution Act, 1974, p.4).

Other areas of water pollution control Acts include the Water-Prevention and Control of Pollution Rules, 1976; the Water-Prevention and Control of Pollution Cess Act, 1977; the Water-Prevention and Control of Pollution Cess Act, 1978 and the Water-Prevention and Control of Pollution Rules, 1983 and 1984.



5.5.4 Certain penalties are also imposed on the offenders of Water Pollution. The Water Act, 1974 prescribes punishment up to three months, imprisonment or fine upto five thousand rupees with an additional fine which may extend upto one thousand rupees per day of continuance for failure to comply with the provisions of the Act. The Indian Penal Code 1872: Section 277 of the Code says:

"Whoever voluntarily corrupts or fouls the water of any public spring or reservoir, so as to render it less fit for the purpose for which it is ordinarily used, shall be punished with imprisonment of either description for a term which may extend to three months, or with fine which may extend to 500 rupees, or with both".

5.5.5 To combat air pollution, the Air-Prevention and Control of Pollution Act, 1981 and the Air-Prevention and Control of Pollution Rules, 1984 have been enacted by the Government of India. In the Air-Prevention and Control of Pollution Act, 1981 the failure to comply with the provisions of Sections 21(5) and 22 is dealt with imprisonment which may extend upto three months and <sup>with</sup> a fine which may extend upto thousand rupees or with both.

5.5.6 The Kerala State Government brought into force the Silent Valley Protected Area (protection of ecological balance) Act, 1979. Another recent Kerala State Government enactment includes the Public Places Protection Act, 1984.

This law covers the protection and control of parks, playgrounds and open spaces in the State of Kerala. The Forest Conservation Acts of 1927 and 1980 state that a forest area should not be diverted to non-forest uses and that, where such diversion is unavoidable, there should be adequate compensation by bringing under the green cover an area of equal dimension. For the implementation of the programmes of the Kerala State Pollution Control Board, an amount of Rs.438 lakhs have been earmarked in the Seventh Plan. Noise Pollution Control are also to be brought under the purview of the Kerala State Pollution Control Board. The following are the schemes proposed under Water and Air Pollution Control.

1. "Augmentation of infrastructure of the Kerala State Pollution Control Board.
2. Establishment of Water and air monitoring stations.
3. Air quality studies in industrial areas.
4. Squad for checking air pollution from distributed sources.
5. Pollution status survey and classification of water bodies.
6. Data bank.
7. Demonstration plants for effluent/emission treatment for small-scale industries.

8. Land pollution control schemes.
9. Identification of noise pollution sources and vulnerable areas and formulation of control measures.
10. Encouraging research relating to environmental pollution.
11. Incentive for pollution control" (Seventh Five Year Plan, 1984, pp.168-169).

#### 5.6.0 Administrative Measures for Environmental Protection in India

5.6.1 India has benefitted from the experience of other nations and international bodies in the field of environmental protection and hygiene. However, the problems encountered in India are qualitatively different from those of other countries and vary widely from one part of the country to another. Pollution of rivers is quite common in India. Industrial pollution is also another area which has contributed to environmental problems. Besides industrial concerns, there are hydro-electric projects, bunds and over-exploited lands which aggravate the environmental situation to an extent that mass protests of people have become quite frequent in many parts of India. In India, we have a number of professional organizations and government agencies devoted to environmental protection, development and hygiene. The Department of Environment, Department of Science and Technology, Department of Ocean Development,

Council of Scientific and Industrial Research, Indian Council of Medical Research, Indian Council of Agricultural Research, Indian Space Organization, Department of Atomic Energy, National Environmental and Engineering Research Institute and state level agencies like Water Pollution Control Boards, Air Pollution Control Boards etc. are the agencies devoted to environmental protection, education and research. Various public bodies are also concerned with environmental protection and regulation e.g. the local self-government bodies like Corporation, Municipality and Panchayat discharge duties pertaining to environmental hygiene.

**5.6.2 Central Government Departments and Agencies: Programmes** and plans in fields of soil conservation, forest and wild life protection, public health, industrial hygiene etc. have been in existence in India for many decades. However, the first formal recognition of the need for integrated environmental planning was made when the Government of India constituted the National Committee on Environmental Planning and Co-ordination in 1972. From 1972 to 1984 much work in a number of areas related to environmental planning was undertaken. Worth mentioning are environmental appraisal of projects from selected sectors, surveys of wet lands and aquatic weeds. At the instance of the National Committee on Environmental Planning and Co-ordination high level Environmental Boards have been constituted in various states and union territories.

5.6.3 Department of Environment, Government of India: The protection of environment is a matter of national concern and is reflected in the directive principles of State Policy of the Constitution of India. Recognising the need for a major co-ordinating body on environment-related action, the Government of India set up in November 1980, a full-fledged Department of Environment. An environmental forum of parliamentarians was also constituted to focus attention on environmental issues. Some achievements of the Department of Environment include a nationwide programme for enforcement of minimal national effluent standards in respect of selected industries like sugar, distilleries, oil refineries and man-made fibres. (Yojana, 1983, p.6.)

5.6.4 Detailed investigations were conducted in the areas proposed for designation as Biosphere Reserves which included Nanda Devi National Park in Uttar Pradesh, Namdapha Wild Life Sanctuary in Arunachal Pradesh and Neora Valley in West Bengal. Special studies were made in respect of endangered and rare species like Indian Wild Ass, the great Indian bustard and Desert Cat in the arid zones and Phayre's leaf monkeys found in Tripura (Yojana, 1983, p.6).

5.6.5 "For the Convention on International Trade in Endangered Species of flora and fauna, a 10 year review on flora has been prepared" (Yojana, 1983, p.6). A new scheme was launched by the Botanical Survey of India in collaboration with

the Universities for intensive studies on floristic resources in 100 selected districts. Surveys of medicinal plants resulted in collection of about 250 specimen (Yojana, 1983, p.6).

5.6.6 Under the Environmental Ecological Research Programme, 37 new projects were approved during 1982-83. These include three major projects, namely All India Co-ordinated Project on Heavy Metals, Multi-disciplinary project on microbial degradation of industrial wastes and the project on studies of environmental aspects relating to the Beas - Sutlej link. The Department of Environment also finances money for various other environmental projects such as long term study on various environmental aspects of multi-purpose river valley projects. Environmental Impact Assessment of development project in the sectors of industry, power generation, transmission, beach development and urbanization is carried out by the department.

5.6.7 During the sixth five year plan, the Department of Environment played an important role in environment-related programmes in all sectors. These programmes were implemented by the relevant ministries/agencies of the central and state governments. The main programmes carried out by the Department of Environment, either directly or through other ministries/agencies/institutions, are given below:

1. Support to Environmental Research and Development to generate the kind of information and data required for the formulation of environmental policy.
2. Environmental Impact Assessment as an integral part of the entire planning process.
3. Monitoring of environmental quality.
4. Setting up of an Environmental Information System for the collection, processing and dissemination of environmental information that will aid planners, decision-makers and researchers.
5. Programmes to increase public awareness about environmental issues and to stimulate public participation in activities for environmental protection (Sixth Five Year Plan, 1980-85, p.349).

5.6.8 Besides the programmes covered in the sixth five year plan, commercial felling of trees in the U.P. hill forests have been taken up by the Department of Environment. Other field action programmes of the department include tree planting, cleaning of water bodies, involvement of communities in areas surrounding biosphere reserves and National parks in protection of wild life. A five year Rs.75 lakh project to study river valley projects in Kerala, including Silent Valley have been taken up by the Department of Environment (D'Monte Darryl, 1983, p.35).

5.6.9 Geological Survey of India: The Geological Survey of India with its headquarters at Calcutta was established more than 120 years ago. It conducts geological, geochemical, geophysical and geotechnical surveys and studies of environmental geology and undertakes research in new techniques in exploration in geology, geochemistry and allied fields. It is concerned mainly with geological mapping and mineral exploration, investigation of ground water, examination of dam sites and other engineering aspects of geology.

5.6.10 The Indian Meteorological Department: Established in 1875 it is the national agency for providing services in the field of meteorology. The department provides data on weather forecasts, warns against severe weather phenomena like cyclones, heavy rain, snow, heat and cold waves and detects the location of earth quakes and seismic risks.

5.6.11 Archaeological Survey of India: Founded in 1861 it is concerned with the exploration and excavation of ancient sites and their maintenance and publication of multifarm records and reviews. All ancient and historical monuments of national importance are undertaken by the central government departments, while other ancient and historical monuments are maintained by state governments. The Archaeological Survey of India has a library which is one of the oldest in the country. It contains rare material not only on India, but also on South-East Asia and East-Asia. Almost all the state governments have their



own archaeological surveys or departments. A Central Advisory Board of Archaeology co-ordinates the activities of the Central and State archaeological surveys in various programmes in archaeology. Some programmes in recent times include the installation of sophisticated sulphur dioxide monitors at selected monuments to minimise the effects of pollutants on the ancient monuments. Work was in progress in 239 monuments as per the approved conservation programme (The Hindu, March 30, 1984, p.6).

5.6.12 Public Health and Environmental Engineering Department, Government of India: Set up in 1954 it checks the possibility of pollution in the drinking water and provides technical advice and guidance to state governments in the preparation and execution of their schemes.

5.6.13 Zoological Survey of India: The Zoological Survey of India is concerned with the protection and preservation of fauna. The Zoological Survey of India, with its headquarters at Calcutta, has regional stations at Dehra Dun, Jabalpur, Jodhpur, Madras, Patna, Poona and Shillong.

5.6.14 The Botanical Survey of India: Located in Calcutta has four main centres namely the Indian Botanical Garden, the Central National Herbarium, the Industrial Section of the Indian Museum and the Central Botanical Laboratory and seven regional circles at Allahabad, Coimbatore, Dehra Dun, Jodhpur, Poona, Port Blair and Shillong. This department is concerned with the protection and preservation of flora.

**5.6.15** Other central government departments and agencies concerned with environmental protection include the Department of Ocean Development, Agricultural Department and Forest Department.

**5.6.16** State Government Departments and Agencies: All the central government departments and agencies concerned with environmental protection have regional offices in all or some states of India, whereas department of water pollution control, public health, forest and agricultural departments are found in almost all states. Through these departments, the state governments discharge duties to protect the citizen and the environment. Expert committees are appointed to assess the unfavourable impact on the environment and suggest measures to minimize the damages. Such committees process the data and information about the proposed projects, identify the environmental parameters and project activities, evaluate the social and ecological impact, suggest the process modifications if any, and provide guidelines for the government to take a suitable decision.

**5.6.17** Pollution Control Departments: The National Environmental Engineering Research Institute located at Nagpur is one important agency concerned with environmental protection and preservation. Established in 1958 it has several laboratories at Ahmedabad, Bombay, Calcutta, Delhi, Hyderabad, Jaipur, Kanpur and Madras. The institute carried out research in

sanitation, disposal of sewage and industrial wastes, industrial hygiene and pollution.

5.6.18 Water Pollution Control Boards: India's concern with environment grew in 1974 when the Water Prevention and Control of Pollution Act of 1974 was enacted. The Act establishes a Central Board for Prevention and Control of Water Pollution and similar boards in the States. These boards are empowered to control pollution primarily through standards laid down by them and the issue of consent orders. For violating the standards or a consent order, stiff penalties have been provided by the Act, namely, imprisonment which shall not be less than six months but which may be extended to six years or a fine upto Rs.5,000/-. Other Acts that followed were the Water-Prevention and Control of Pollution Cess Act of 1977 and the Air-Prevention and Control of Pollution Act of 1981.

5.6.19 The Kerala State Board for Prevention and Control of Water Pollution was constituted in 1974 under the provisions of the Water Act. With the enactment of the Air Act in 1981, the scope of activities of the Board got widened and hence it has been renamed in 1982 as the Kerala State Pollution Control Board. The Kerala State Pollution Control Board was established to combat air pollution and prevent clean water from becoming polluted. The major functions of the Board include:

1. grant of consent to the industries and other agencies in Kerala for discharging their effluents,
2. preparation of a comprehensive plan for prevention, control and abatement of pollution,
3. monitoring the quality of water in the rivers and water bodies continuously so as to plan control programmes to restore the quality befitting the best designated uses,
4. advising the state government on all matters concerning water pollution,
5. encouraging <sup>the</sup> /carrying out research and investigations relating to problems of water pollution and prevention,
6. laying down standards for treatment of sewage and treating effluents and reviewing plans and specifications (Kerala Economic Review, 1983, p.120).

5.6.20            Some achievements of the Board include the analysis of 2,300 samples of effluents from industrial outlets and water samples from different rivers and lakes in Kerala. Regular monitoring of rivers such as Periyar, Chaliyar, Pampa, Kallada and Moovattupusha was undertaken during the year 1982-83. The Board studied 250 cases of effluent discharges in the year 1984 and issued consents to the dischargers as required under law (Kerala Economic Review, 1983, p.92). A number of prosecution cases, including cases against the Punalur Paper Mills and Gwalior Rayons were filed during the

year 1982 in various courts under the provisions of the Water Act 1974. The Board has taken legal action against many industries, which have not adhered to instructions of the Board. Other achievements include a study on pollution of Periyar river which has been completed by the Board with financial assistance from the Department of Science and Technology, New Delhi.

5.6.21 The Air-Prevention and Control of Pollution Act, 1981 came into force throughout Kerala from May 16, 1981. The major functions of the State Pollution Control Board include:

- 1) to identify air pollution control areas,
- 2) to prescribe air pollutant emission standard,
- 3) to prepare inventory of air pollution sources, and
- 4) regular monitoring of ambient air pollutants (Kerala Economic Review, 1983, p.121).

5.6.22 For the discharge of the above functions, an air pollution control cell has been established in the State Board. The Kerala State Pollution Control Board has prepared an inventory of factories and agencies causing air pollution. Action is being initiated to tackle the problem of air pollution in the air polluted area of Udyogamandal, Cochin, Naveer in Calicut and Kochuveli in Trivandrum.

5.6.23 Local Administration: In most of the states corporations have been established for major cities under specific Acts of the State legislature. The functions of the Municipal Corporation include public safety, health, education and other conveniences of the citizens as well as the construction and maintenance of water works and sewage, streets, bridges, parks and recreation grounds.

5.6.24 Besides corporations, village panchayats are the other local bodies which are responsible for proper sanitation, arrangements for the proper removal and disposal of human, animal and domestic wastes. They are also responsible for the maintenance of village roads, streets, tanks, wells and provision of drainage.

#### 5.7.0 Environmental Litigations - Global

##### 5.7.1 Role of courts and environmental groups in society:

Functionally speaking, any branch of law is concerned with balancing of interests and resolution of conflicts between two competing groups. All the three arms of government, namely the legislative, executive and judiciary discharge this function. Theoretically speaking, the legislature can only lay down a series of rules and regulations pertaining to the justice of the two groups. The practical side of the problem lies in finding a solution. In modern welfare state, the state represents public interest. But it so happens that the State

is incapable of protecting the interests of all segments in society. In fact, the State will never have sufficient time, money, resources or manpower to satisfy all the varied interests in society. So it is the duty of the citizen to approach the court of laws for seeking justice <sup>for</sup> and/resolving conflicts. The court does not act, but it is the citizen who takes the initiative to bring to the notice of the court any deviations from the normal standards of the legislation. Irrespective of caste, creed, nationality or status in society, the law is equal for all its citizens. These principles require that justice should reach from the topmost strata to the lowest strata of society. The problem might be a mammoth one, no doubt, but, that does not mean it is not without a solution. The question remains how far environmental pressure groups have succeeded in bringing environmental suits before the courts of law, in an attempt to protect the quality of environment.

5.7.2 Traditional problems in environmental matters: Traditionally, legal systems have been ready to come to the aid of individuals suffering damage or loss, whether of a personal or of a proprietary nature, where the activities of others may have occasioned such damage or loss (Bentil Kothu, J., 1981, p.324). In relation to the individual activities arising from environmental damage or harm, legal systems have been framed on well defined lines so as to provide compensation or some other remedy to affected parties under certain well defined

clauses and conditions. Thus, for example, an individual farmer, carrying on his farming activities near a river may have had his farm products ruined as a result of some polluting activity carried out by a chemical factory upstream. If the farmer concerned is able to prove that he has actually suffered the loss and the loss occurred directly from the polluting activity of the chemical factory, a successful action at civil law could be sustained. However, since the nature of pollution differed widely from country to country and from one chemical factory to another, its consequence on the environment also differed. In some cases, pollution of environment was a mere nuisance, in other cases, pollution like air and sound trespassed across boundaries and its effect could not be proved materially. Consequently environmentalists and conservationist pressure groups did not get much help in their endeavour to protect and improve the quality of the environment under the traditional system of common law. As a result, in the succeeding years there emerged other devices by which environmental pressure groups could approach the court.

5.7.3 Problems in environmental litigation: Some of the problems faced by environmental pressure groups in the field of environmental litigation are wide and varied. The idea that environmental law is concerned with preservation of the environment and prevention of deterioration of the environment would pose an array of questions, like, for instance, what would



happen if the environment is polluted. But there are no injured persons and if the environment is injured why should the environmentalist complain? In the second case there is somebody affected, but their number being small, they become unidentifiable, unorganized and their interest is insignificant which can be termed as 'diffuse interests' (Cappelleth, M., 1979, p.519) and hence they do not come forward to complain. What would happen if a few aggrieved persons take the initiative to complain? Perhaps many of them will be excluded by the strict rules of locus standi. So, how to protect their interests? Are they not entitled to a fair and easy access to seek justice in a court of law?

5.7.4 Public interest litigation: Any litigation invoking the principles of public interest law to acquire a locus standi for the suitor or for other purposes is public interest litigation (Sampath, D.K., 1983, p.3). "The term 'locus standi' denotes legal capacity to institute proceedings in courts and is used interchangeably with terms like 'standing' or 'title to sue'" (Thio, S.M., 1971, p.1). In particular the role of locus standi has no relevance once the court entertains an action as public interest litigation (Chidambaram, P., 1983, p.17). The 'public' in public interest litigation need not be every member of the population. For example only a small proportion of the citizens will find itself behind prison gates. Yet there is a clear public interest in ensuring the civil

rights of prisoners - their right to a fair and speedy trial, right of access to courts and right to human conditions of detention. In short, the emphasis in Public Interest Law is on securing representation for the 'unrepresented' (Sampath, D.K., 1983, p.3). They may be unrepresented due to poverty, ignorance, physical disabilities, ethnic difference, smallness of their number etc. They are denied access to courts of justice because of the above mentioned handicaps. According to Justice Bhagwati, public interest litigation is "one of the methods by which justice can be delivered to the poor. Though large in number, the poor are in effect a minority, dumb, defeated and downtrodden" (Sampath, D.K., 1983, p.3). They are the unrepresented. To represent them, the person who gives legal aid uses public interest litigation as an effective means, circumventing the barriers to justice raised by poverty, ignorance, illiteracy and similar causes.

5.7.5            Public Interest Litigation had originated in the Indian legal system during the last few years. Part-III and Part-IV of the Constitution confers hope to millions of people, particularly the poor and the illiterate who have been denied social and economic justice. The large number of cases under public interest litigation would indeed be cases designed to secure to the forgotten masses, the rights conferred by Part-III and Part-IV of the Constitution.

**5.7.6 Devices used by the environmentalists to approach the court:** A citizen has two devices - citizen suits and the class action - to approach the court. Basically, 'citizen suits' are brought by individual or individual associations or groups, on behalf of the general public, for the purpose of protecting that which is in the interest of the general community. In that context, the individual groups or associations speak for the general public, as well as seek to protect the interest of the general community. Some public spirited individuals group together to form a pressure group and, as their objectives for maintaining a clean environment are similar, decide to resort to the judicial process as a means of realising that objective.

**5.7.7** In contrast to the citizen suits we have the class action device by which aggrieved individuals approach the court. In the case of 'class action' various individuals who are directly affected as a consequence of the environmentally harmful activities of a particular concern agree to join their individual legal claims in one action against the latter. Class action could be either plaintiff actions or defendant actions.

**5.8.0 Environmental Litigation Cases - In the United States of America**

**5.8.1** A look into some of the environmental litigation cases would show the role played by the Courts of law in protecting the interests of environmental groups.

5.8.2 Case-I - New Mexico Citizens for clean air and water Vs. Train: This case presents the struggle between the competing societal interests of industry and the environment. Plaintiffs consist of two environmentally oriented citizen groups, the 'Sierra Club' and the 'New Mexico Citizens for clean air and water' and Dr. Robert Bennett, a land owner in the proximity of the project. In addition to the corporate defendant, defendants include Russell E. Train, Administrator of the Environmental Protection Agency and Aaron Bond, Director of the New Mexico Environmental Improvement Agency. Defendants Train and Phelps Dodge urge dismissal of the complaint. Responding to a need for increased copper smelting capacity in the United States, Phelps Dodge undertook to construct a smelter in Hidalgo County, New Mexico and work commenced at the site in the summer of 1972. Prior to the commencement, the Company and the Environmental Improvement Agency (EIA) entered negotiations with the Federal and State Pollution Control <sup>agency</sup> in anticipation of obtaining a permit. Phelps <sup>Dodge Company</sup> / obtained a permit on May 10, 1973 and a sum of 4.67 million out of a total projected cost of 8.167 million for construction purpose.

5.8.3 The respective plaintiffs intervened that the plant's operation would cause substantial environmental damage to the current ecosystem in the Playas Valley. This region lies midway between the Animas and Hatcher Mountains in S.W. New Mexico. The plaintiffs allege that the smelter would

violate ambient air quality standards and sulphur dioxide compounds would be emitted into the surrounding atmosphere.

Besides, the sulphur effluents released will result in a significant deterioration of existing air quality.

5.8.4 Judgment: "The plaintiffs would not be irreversibly harmed by a denial of injunctive relief at this stage. Besides continued construction of the facility in the interim before final hearing does not threaten the plaintiffs' interests. The equities clearly favour the defendant, who faces substantial financial damage if its operations are interrupted or if the suspension is limited to construction of the Smelter's emission control facilities. Since no claim has been stated against defendant Train upon which relief could be granted, his motion for dismissal interposed by defendant, <sup>Dodge Company</sup> Phelps / will be denied pending final hearing of the case. Appropriate orders shall be entered in accordance herewith" (Currie P. David, 1971, p.493).

5.8.5 Case-II - Environmental Defense Fund Vs. Tennessee Valley Authority: Plaintiffs consist of 3 organizations and an individual asserting that they will be irreparably harmed if the TVA continues construction of the Tellico Project on the little Tennessee river. Defendants include the Tennessee Valley Authority and its Officers and Agents.

5.8.6           The Tellico Project involves the construction of a dam on the little Tennessee below its mouth. The little Tennessee river rises in the mountains of Western North Carolina and flows north-westerly to its confluence with the Tennessee river in eastern Tennessee. TVA would require 18,000 acres of land for the project and the purpose is to foster the economic development of the three Tennessee countries through which the river flows. It is assumed that the project would <sup>also</sup> provide electric power, recreation and control flood.

5.8.7           The district court found the free flowing Tennessee river to be the largest and best trout fishing water east of the Mississippi river. Major historical and archaeological sites are found along the banks and bottom land of the little Tennessee, such as Fort London and the ancient capital of the Cherokee nation. The court further found that the river consists of seven rare or endangered fish species in a pristine state and tampering with it will destroy much valuable farmland.

5.8.8           On June 18, 1971, TVA filed a draft environmental impact statement with the Council on Environmental quality. Two months after the statement was filed, this law suit was initiated. On January 3, 1972, plaintiffs moved for a preliminary injunction against any further construction on the Tellico project until defendants filed an adequate environmental impact statement.

**5.8.9**     Judgment: The court granted plaintiffs' motion except with respect to defendants' completion of road building operations that had progressed to a stage, and road surfacing was necessary to prevent large-scale soil erosion. The court also permitted certain map-making and reporting activities to proceed (Gray v. Oscar, 1973, p.87).

**5.8.10**    Case-III - Illinois Vs. City of Milwaukee: The defendants consisted of 4 cities of Wisconsin, the Sewerage Commission of the City of Milwaukee and the Metropolitan Sewerage Commission of the County of Milwaukee. The cause of action alleged is pollution by the defendants of Lake Michigan, a body of inter-state water. According to the plaintiff, some 200 million gallons of raw or inadequately treated sewage and other waste materials are discharged daily into the lake in the Milwaukee area alone. The plaintiffs alleged that the defendants should abate this public nuisance.

**5.8.11**    Judgment: The case was remanded and the district court found that Milwaukee discharges threatened the health of the residents of Illinois who bathed in or used public water supplies drawn from lake Michigan. So the court ordered the defendants to cease discharging / <sup>untreated</sup> wastes into the lake. To achieve this, the court prescribed Environmental Quality Standards which / <sup>were more</sup> stringent than those required by discharge permits issued to defendants under the Federal Water Pollution Act as assumed in 1972 (Findley Neger, Daniel A'Farber, 1981, p.45).

5.8.12 Case-IV - Sierra Club Vs. Morton: The main plaintiff is the Sierra Club. It is a large organisation with thousands of members. The main defendant is the Walt Disney Enterprises.

5.8.13 The Sierra Club was an organisation with a commitment to the cause of protecting America's natural heritage from man's degradation. The Federal officials granted permits to the Walt Disney Enterprises to construct a ski resort in the Mineral King Valley. The Club alleged that the development of the valley in this way would destroy or otherwise adversely affect the scenery, natural and historical objects and wild life of the park and would impair the enjoyment of the park for future generations.

5.8.14 Judgment: The Supreme Court ruled in 'Mineral King' that the complaint was defective because the Sierra Club failed to allege that it or its members would be affected in any of these activities (Rodgers H. William, 1978, p.24).

5.8.15 Environmentalist groups such as the 'Sierra Club', 'Environmental Defense Fund', 'Citizens for Clear Air', 'Scenic Hudson Preservation Conference' and 'Citizens for a better Environment' have from time to time drawn the attention of the Court to environmental problems. Law suits by individual citizens are a new form of pressure tactic. For example, Michigan in 1970 enacted a law that permits private citizens to sue polluters without having to show evidence of direct personal injury.



### 5.9.0 Environmental Litigation Cases in India

5.9.1 Case-I - Ratlam Municipality Vs. Vardhichand: The plaintiffs consist<sup>ed</sup> of a group of citizens directly and individually affected by the unsanitary conditions complained to the court against the discharge of effluents into the streets, lack of drinking water and the unsanitary atmosphere created as a result of the Municipality's indifference.

5.9.2 Judgment: The court directed the Municipal Council to stop the flow of effluents into the streets to construct a sufficient number of private latrines, to provide water supply and sewage service and<sup>to</sup> ensure sanitation. It directed the Municipality to fill up the cess pools and keep the place free from accumulation of filth. It commanded the Sub-Divisional Magistrate to prosecute the officers who did not comply with the directions.

5.9.3 Case-II - Society for Protection of Silent Valley Vs. Kerala State Electricity Board, Trivandrum: The plaintiffs consist<sup>ed</sup> of Society for Protection of Silent Valley represented by its Executive Secretary R.K. Ramesh and M.K.N. Potty. Defendants include Union of India represented by Secretary to Government, Ministry of Agriculture and Irrigation; State of Kerala, represented by Chief Secretary to Government and the Kerala State Electricity Board, Trivandrum.

5.9.4           The plaintiffs pointed out/<sup>that</sup> the Silent Valley in the district of Palghat contained one of India's largest tropical evergreen forests as           the only vestige of virgin forest in the western ghats. It is estimated to have a continuous record of not less than 50 million years of evolutionary history, with diverse and complex flora and fauna. It is<sup>a</sup> unique vegetable food resource which contains mammals and birds in the valley. A number of endangered plants and animals live there. The forests perform very many important functions. They regulate water supply to the plains by retaining rainwater in the soil and releasing it slowly down, maintaining the hydrological balance, averting floods and droughts in the plains. Soil erosion is prevented and the climatic condition of the whole area is regulated by the forests (Cochin University Law Review, 1984, pp.128-129).

5.9.5    Judgment: The Kerala High Court dismissed the petition stating:

"But in this region we cannot substitute our judgment for that of the Government, on the question as to whether a national asset is to be more conveniently utilised as a hydro-electric project with prospects of greater power generation, or retained in its pristine glory or preservation of forests and wild life, prevention of soil erosion and avoidance of other deleterious effects on the community"  
(Prasad, M.K., 1984, p.129).

5.9.6 Case-III - Eloor Panchayat Vs. General Manager of Indian Rare Earths Ltd. The plaintiff consist<sup>ed</sup> of the Eloor Panchayat represented by its Executive Officer. Defendant consisted of the General Manager of Indian Rare Earths Ltd., Udyogamandal.

5.9.7 The Indian Rare Earths Ltd. at Udyogamandal took a decision in 1981 to deposit waste generated from the production of thorium in the factory premises. The Eloor Panchayat objected to this decision of the management. In the writ petition filed at the Kerala High Court, the Executive Officer of the Panchayat prayed that the company be directed to remove the waste to safe places away from the Eloor Panchayat. According to scientists poisonous particles of thorium, lead sulphide and uranium even though preserved in concrete containers and buried beneath the earth, would have far reaching and complicated consequences. More over the <sup>laboratory personnel</sup> physicist of the Indian Rare Earths Ltd. had expressed the opinion that the radio-activity from the waste would pollute the subterranean water in an area at least of 25 kilometres radius. The Executive Officer of the Eloor Panchayat pointed out that the President and members of the panchayat had made a representation before the management of Indian Rare Earths Ltd. so as to dissuade them from burying these items in the factory premises. Despite all these attempts the management proceeded in implementing

its earlier decision. The petitioner prayed that the court direct the Indian Rare Earths Ltd. to remove the waste from the factory premises, since the panchayat was responsible for safeguarding the inhabitants of the locality.

5.9.8 Judgment: The case is still pending at High Court.

#### 5.10.0 Conclusions

5.10.1 A review of legislations for the protection of the environment reveal that there is an environmental consciousness all over the world. Developed countries have already shown their interest in environmental conservation and in ensuring an environment free from industrial pollution. A series of legislations have been enacted in the United States of America and in United Kingdom to provide clean air and clean water to the population.

#### 5.10.2 Major legislations for ensuring clean air:

Air Pollution Control Act, 1955 (U.S.A)

The Clean Air Act, 1956 (U.K)

The Clean Air Act, 1963; 1965; 1966 (U.S.A)

Air Quality Act, 1967 (U.S.A)

The Clean Air Act, 1968 (U.K)

The Clean Air Act, 1970 (U.S.A)

**5.10.3 Major legislations for ensuring clean water:**

The Rivers Pollution Act, 1876 (U.K)  
 The Salmon and Fresh Water Fisheries Act, 1923 (U.K)  
 The Water Act, 1945 (U.K)  
 Water Pollution Control Act, 1948 (U.S.A)  
 The Rivers-Prevention of Pollution Act, 1951 (U.K)  
 Water Pollution Control Act, 1952 (U.S.A)  
 Oil in Navigable Waters Act, 1955 (U.K)  
 Water Pollution Control Act, 1956; 1961 (U.S.A)  
 The Public Health Act, 1961 (U.K)  
 The Water Resources Act, 1963 (U.K)  
 Oil in Navigable Waters Act, 1963 (U.K)  
 Water Quality Act, 1965 (U.S.A)  
 The Salmon and Fresh Water Fisheries Act, 1968 (U.K)  
 The Sea Fisheries Regulations Act, 1966 (U.K)  
 The Clean Water Restoration Act, 1966 (U.S.A)  
 The Water Quality Improvement Act, 1970 (U.S.A)  
 Oil in Navigable Waters Act, 1971 (U.K)  
 The Federal Water Pollution Control Act, 1972 (U.S.A)

**5.10.4 Major legislations for regulating the amounts of pesticide residues:**

The Federal Insecticides Act, 1910 (U.S.A)  
 The Federal Food, Drug and Cosmetic Act, 1938; 1954 (U.S.A)  
 The Federal Insecticide, Fungicide and Rodenticide Act,  
 1947; 1959 (U.S.A)

The Environmental Pesticide Control Act, 1972  
(U.S.A)

**5.10.5 Major legislations to control and regulate noise:**

The Noise Abatement Act, 1960 (U.K)  
Noise Pollution and Abatement Act, 1970 (U.S.A)  
The Noise Control Act, 1972 (U.S.A)  
Health and Safety at Work Act, 1974 (U.K)  
The Control of Pollution Act, 1974 (U.K)  
The Wood Working Machine Regulations, 1974 (U.K)  
Noise Insulation Regulations 1975 (U.K)

**5.10.6 Major legislations to control hazardous wastes:**

The Solid Waste Disposal Act, 1965 (U.S.A)  
Recovery Act, 1970 (U.S.A)  
The Deposit of Poisonous Wastes Act, 1972 (U.K)  
The Control of Pollution Act, 1974 (U.K)

**5.10.7 Major legislations to control air pollution in India:**

The Bengal Smoke Nuisance Act, 1905  
The Air-Prevention and Control of Pollution Act, 1981  
The Air-Prevention and Control of Pollution Rules, 1984

**5.10.8 Major legislations to control water pollution in India:**

Orissa River Pollution Prevention Act, 1953  
The River Boards Act, 1946  
The Merchant Shipping Act, 1958

The Maharashtra Prevention of Water Pollution Act, 1969  
 The Water-Prevention and Control of Pollution Act, 1974  
 The Water-Prevention and Control of Pollution Rules, 1976  
 The Water-Prevention and Control of Pollution Cess Act,  
 1978.

The Water-Prevention and Control of Pollution Rules, 1983  
 and 1984

**5.10.9 Major legislations directly or indirectly relating to the environment:**

The Forest Conservation Act, 1927  
 The Indian Forest Act, 1927  
 The Motor Vehicles Act, 1939  
 The Factories Act, 1948  
 The Insecticides Act, 1968  
 The Wild Life Protection Act, 1972  
 The Silent Valley Protected Area Act, 1979  
 The Public Places Protection Act, 1984

**5.10.10** To ensure protection of the environment there are certain governmental agencies such as Water Pollution Control Board, National Environmental Engineering Research Institute, etc. and professional organisations devoted to environmental protection, education and research. Recognising the need for a major co-ordinating body on environment - related action, the Government of India have set up in November 1980 a fullfledged Department of Environment.

5.10.11           Disseminating information through education, training and research for creating public awareness, planning of action programmes, influencing the government for legislative enactments and vitalising enforcement machineries for the control of environmental pollution have been the main thrust of the Environmental Protection Movement. Public awareness with social action programmes by voluntary agencies and local groups for the protection of the environment and/or for protesting against environmental pollution has earned a special significance in India, particularly in Kerala during the last half of 1970s. This special social significance for environmental protection has often been reflected in certain social movements in many parts of the country in the form of dharna, satyagraha, mass publicity, etc. directed against agencies assumed to be responsible for contributing to industrial pollution.

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## CHAPTER - VI

### 6.0.0 NATURE, SOURCES AND CONSEQUENCES OF INDUSTRIAL POLLUTION IN FLOOR-KALAMASSERY INDUSTRIAL BELT AS PERCEIVED BY CERTAIN RELEVANT SEGMENTS OF PUBLIC IN THE LOCAL AREA

#### 6.1.0 Introduction

6.1.1 The Floor-Kalamassery area is considered as the major industrial belt in the Kerala State. Most of the industries in this area are situated on either side of the river Periyar.\* There is a heavy concentration of chemical industry in the area. The Fertilisers And Chemicals Travancore Ltd., The Travancore Cochin Chemicals, Indian Rare Earths, The Periyar Chemicals, The Cominco Binani Sinc Ltd., The Hindustan Insecticides Ltd., The Travancore Chemical Manufacturing Company and the Catalysts and Chemicals are the major chemical industries in the area. Concentration

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\* The river Periyar is one of the major rivers in Kerala and has a length of 244 kms. with an estimated 11,600m<sup>3</sup> volume of water. Residents of Cochin, Alwaye, Kalamassery, Floor and surrounding areas depend on the river for drinking water. In addition, industrial units, agriculture and fish and prawn culture depend on the river Periyar for their fresh water intake.

of such chemical industry on the banks pollutes the river Periyar with maximum quantity of industrial effluents causing several problems. Recently pollution in the area has become a topic for public discussion and attempts have been made to investigate the nature and problems of pollution in the area.

6.1.2 Several studies have been conducted in this area to ascertain the degree of air, water and radiation pollution as a result of the presence of the chemical industry. The following studies provide objective data on the degree of environmental pollution in the area. Studies conducted by George Mathai Tharakan in 1976 in the area showed the presence of sulphur dioxide, chlorine, carbon dioxide, ammonia, fluorine and particulate matter in the air (Tharakan M. George, 1976, p.8). According to the State Planning Board nearly 90% of air pollution in Kerala is mainly due to the chemical industry (Gopalakrishnan, P.K., 1978, p.85). In 1978-'79 a study was conducted by the National Environmental Engineering Research Institute on the conditions of atmosphere over Cochin city including Udyogamandal (Eloor) as one of the monitoring stations. The values obtained for parameters like sulphur dioxide, nitrogen dioxide and suspended particulate matter exceeded the desirable limits\* to cause pollution of

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\* Desirable limits refer to the maximum amount of a pollutant legally permitted to be discharged from a single source, either mobile or stationary.

the atmosphere around the Kloor-Edayar belt (NEERI, 1980, pp.78-79). The findings of NEERI are given in Table 6.1.2(a).

**Table 6.1.2(a) (1)**

**Concentration of Sulphur Dioxide, Nitrogen Dioxide and Suspended Particulates at Udumalpet Area**

Month	Average Concentration of Given Parameters (in $\mu\text{g}/\text{m}^3$ )		
	SO <sub>2</sub> (every 10th day, 24 hrs.)	NO <sub>2</sub> (once a month, 24 hrs.)	Suspended particles
<b>1979</b>			
January	.. --	--	--
February	.. 190	8	153
March	.. 34	10	112
April	.. 55	28	150
May	.. 53	26	144
June	.. 206	13	194
July	.. 211	13	150
August	.. 94	18	193
September	.. --	--	--

Source: Compiled from 'Air Quality in Selected Cities in India', NEERI, Nagpur, 1980, pp.78-79.

Another study conducted by the National Environmental Engineering Research Institute in October, 1979 showed the presence of metals like mercury in Periyar river. The study also established the presence of free chlorine, ammonia, fluorine and traces of radioactive elements in the Periyar river (NEERI, October, 1979, p.5). Studies conducted by the Central and State Boards

for Prevention and Control of Water Pollution indicated the level of pollutants in the river Periyar to be alarmingly high due to the industrial effluents (NEERI, October, 1979, p.5). In the year 1982-'83 all the industries in the area together discharged more than 1020 lakh litres of effluents per day into the river (Kerala Economic Review, 1982, pp.238-239). Dr. P.V.S. Namboodiripad made a study on the concentration of sulphur dioxide in the area and obtained certain alarming results\* as given in Table 6.1.2(b).

**Table 6.1.2(b) (2)**  
**Concentration of Sulphur Dioxide in Kollam-  
Mavelur Industrial Belt**

Time	3rd Sept. 1978	5th Oct. 1978	20th Nov. 1978	26th Dec. 1978
1st 4 hrs. ..	425	700	191	238
2nd " ..	97.5	177	373	148
3rd " ..	83	21	208	113
4th " ..	51.2	12	20	45
5th " ..	62.1	Spoiled	25	90
6th " ..	557.5	225	13	195

**Source:** Dr. P.V.S. Namboodiripad, 'The Air We Breathe', in World Environment Day Seminar, June 5, 1982, Cochin.

\* According to the Ambient Air Quality Standards sulphur dioxide concentration should not exceed 60  $\mu\text{g}/\text{m}^3$

In 1983 another study using laser beams, Sathesekumar, M.K. and Vallaban, C.P.G. of the Department of Physics, Cochin University revealed that the concentration of air pollutants in the area was most intense during night between 12 p.m. and 3 a.m. (Sathesekumar, M.K. and Vallabhan, C.P.G., 1983, p.324). Mr. Antony, C.A. in his study in the Eloor-Bhayar industrial belt confirmed the presence of air pollution in the area (Antony, C.A., 1983, p.118).

**6.1.3 Relevance of the present study:** No social scientist in Kerala has so far conducted studies on the nature, sources and consequences of industrial pollution as perceived by the local people who are affected by such environmental problems; nor about reactions to such industrial pollution. In Kerala, recently there has been a spurt of environmental consciousness and growth of Environmental Movement which became conspicuous by the famous 'Silent Valley' controversy. In addition, certain social developments in the form of organised efforts to influence the management to adopt pollution control measures for the benefit of the local residents have taken place in many parts of Kerala, worth mentioning are pressure groups at Maveer against the Gwalier Silk Manufacturing Company and at Velloer against Hindustan Paper Corporation. Perception of the nature, sources and consequences of industrial pollution by the local residents and their reactions to industrial pollution and the effectiveness of social pressure groups in influencing management

decisions are areas for detailed studies which have not been undertaken so far in Kerala. The present work of the researcher focusses attention on these aspects of a social phenomenon from the point of view of a social science student.

6.1.4 This chapter of the thesis presents the nature, sources and consequences of industrial pollution as perceived by certain relevant segments of the public in the Kloor-Kalamassery industrial belt. Chapter VII depicts the reactions of various relevant segments in the area to the problems of industrial pollution. And Chapter VIII discusses in detail the structure, strategies and role of environmental protection pressure groups in Kerala, especially against industrial pollution.

#### 6.2.0 Awareness of Industrial Pollution by Various Relevant Segments of the Public in Kloor-Kalamassery Area

6.2.1 In order to have a better understanding of problems of industrial pollution in the area, primary data have been collected on the perception of nature, source and consequences of industrial pollution by different segments of the public residing in the Kloor-Kalamassery industrial belt. Selection of various relevant segments and sample respondents from within each segment have been

discussed in Chapter I under Scope and Methodology. Questionnaire distributed to these various segments are given under Appendix II b, Appendix III, Appendix V b and Appendix VI .

**6.2.2 Background information of the respondents:** An analysis of the background of the medical practitioners showed that majority of them were residents of the Kloor-Kalamassery area. Thirty of the respondents were males while the remaining twentyfive were females. Twentyeight of the respondents were specialists in areas like skin, ENT, heart, eyes, kidney, children and women. Majority of the respondents were general practitioners without additional professional qualifications. Years of service varied from five to twentyfive . Twentyfive of the practitioners had five years of experience, thirteen of them had ten years of experience and seventeen of them had more than ten years of experience. Ten of the respondents were employed in the industrial units in the locality, seven of them were full time practitioners while three of them were part time practitioners working three, four and five days per week in the industrial units.

**6.2.3** In an attempt to find out the consequences of industrial pollution on animals a questionnaire was prepared for the veterinary surgeons of the area. The

number of veterinary hospitals in the Eloor-Kalamassery area is quite limited. There are only four veterinary surgeons - one surgeon - for each hospital. All the veterinary surgeons are males and residents of the locality. Years of service ranged from five years to twenty years.

6.2.4 In order to find out the consequences of environmental pollution on plants as perceived by the farmers a questionnaire was prepared for the farmers of the Eloor-Kalamassery industrial area. Out of a total population of 600 farmers within 5 km. radius from Fertilisers and Chemicals Travancore Limited in all directions a 20% sample was drawn by using the random sampling method (Tippetts' method) and nearly 120 questionnaires were distributed. Fifty per cent responses were obtained from the farmers of the area. Analysis of the questionnaires showed that 16.67% responses are from the age group 25 to 34 years and 26.67% responses are from the age group 35 to 44 years. The remaining 56.66% respondents belonged to the 45 years and above age group.

6.2.5 As for the educational qualifications of the farmers, most of the respondents were S.S.L.C. constituting 43.33% of the total respondents. Respondents who were below S.S.L.C. constituted 26.67% and 20% were found graduates. The remaining 10% of the respondents were postgraduate degree holders.



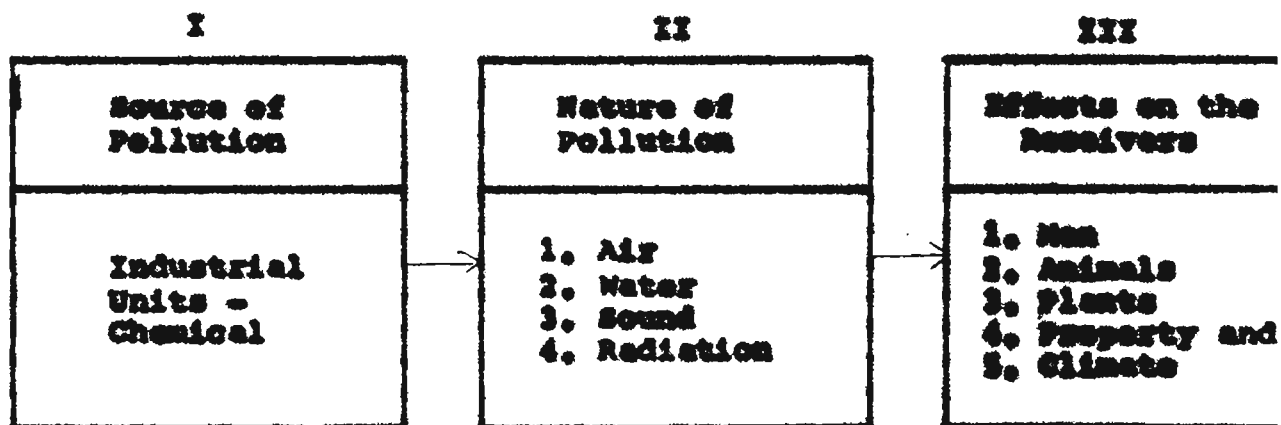
**6.2.6** The chief crops cultivated in the area are paddy, coconut, arecanut and vegetables. The total area under cultivation is 41 acres. Nearly 26.67% (15 respondents) of farmers have more than 1 acre of cultivable land, whereas 73.33% (44 respondents) farmers have 1 and less than 1 acre of land under cultivation. 16.67% (10 respondents) of farmers have a total of 12 acres of paddy cultivation, 70% (42 farmers) of the respondents have a total of 25 acres of coconut cultivation and 3.33% (2 farmers) of the respondents have one acre of arecanut cultivation and the remaining 10% (6 farmers) respondents have 3 acres of vegetable cultivation. The annual income from the cultivation of crops is more than Rs. 5,000/- for 6.67% (4 farmers) respondents. 28% of farmers belonged to a category having an annual income ranging from Rs. 1,001 to Rs. 4,999/-. Majority of the farmers comprising 60.33% of the respondents were having only less than 1,000/- rupees per annum from their cultivation of land. On the whole majority of farmers were having small land holdings with poor annual income from the agricultural holdings.

**6.2.7** Regarding the possession of domestic animals by these farmers it was found that 83.33% respondents owned poultry, 50% owned cows, 16.67% owned goats and 10% of the respondents owned buffaloes.

6.2.8 As stated earlier, lack of co-operation from the management of industrial units in Kloor-Kalamassery area resulted in failure to obtain data on the perceptions of and reactions to environmental pollution. However attempts were made indirectly to collect data from individual managers. The background of the managers showed that majority of them were engineers and occupied senior and middle level positions in the chemical units. The average age of the respondents were forty eight years and majority of them were residents of the local area.

6.2.9 Another category of respondents was representatives of workers (Trade Unions) of 3 major chemical units in the area. Analysis of the background information of these worker trade union leaders showed that the respondents were residents of the area and had lived in the locality for more than 25 years. The average age of the respondents was 39 years. 50% of the respondents were matriculate with I.T.I. qualification and the remaining were having college education.

6.2.10 The pollution system: Industrial pollution can be depicted as a system consisting of three basic components as shown in Figure 6.2.10. In this system the source of pollution is assumed to be the chemical units in the Kloor-Kalamassery area. The second component of the system is the

Fig. 6.2.10Basic Components in the Pollution System

dispersion of pollutants from the source through air, water and land. The third component in the system is the effect of pollution on the receivers namely man, animals, plants property and climate.

**6.2.11** Are the various relevant segments of the public aware of industrial pollution in the area? and if yes, are there variations in their awareness due to their background differences? Table 6.2.11 given below provide information on these questions.

**6.2.12** The subjects who responded to the question are unanimous in their opinion that there is industrial pollution in the Kloor-Kalamassery area. Several scientific studies conducted in the area on the magnitude of pollution

**Table 6.2.11 (3)****Awareness of the Existence of Industrial Pollution  
in the Area as Reported by Various Segments**

Segments	Total No. of Respond- ents (Sample/ Population	Percentage of Endorsement by Various Segments on the Awareness of Environ- mental Pollution	
		Aware	Not Aware
Medical Pra- ctitioners	55	55 (100%)	0 (0%)
Veterinary surgeons	4	4 (100%)	0 (0%)
Farmers	60	60 (100%)	0 (0%)
Managers	30	30 (100%)	0 (0%)
Trade union leaders	15	15 (100%)	0 (0%)

prove the presence of heavy industrial pollution in the Kloor-Kalamassery belt. (Tharakan, M. George, 1976, p.8; NEERI, 1979, p.3; NEERI, 1980, p.1; Nambodiripad, P.V.S., 1982; Sathes Kumar, M.K. and Vallabhan, C.P.G., 1983, p.224; Antony, C.A., 1983, p.118).

**6.3.0 Perception of the Source of Industrial Pollution**

**6.3.1** Questions relating to the perception of the source of pollution reveal that most of them perceive the industrial units especially chemical units as responsible for the existence of pollution. However none of them could identify any specific industrial unit responsible for environmental pollution. Table 6.3.1 (a) and Table 6.3.1 (b) show the data obtained on these aspects.

**Table 6.2.1 (a) (4)**  
**Perception of Industrial Units as the Source of Pollution**

Segments	Total No. of Respondents Sample/Population	Percentage of Endorsement by Various Segments on the Perception of Industrial Units as the Source of Pollution	
		Yes	No
Medical Practitioners	55	55 (100%)	0 (0%)
Veterinary surgeons	4	4 (100%)	0 (0%)
Farmers	60	60 (100%)	0 (0%)
Managers	30	30 (100%)	0 (0%)
Trade union leaders	15	15 (100%)	0 (0%)

**Table 6.2.1 (b) (5)**  
**Types of Industries Responsible for Environmental Pollution in the Area**

Segments	Total No. of Respondents (Sample/Population)	Percentage of Endorsement by Various Segments on the Type of Industry Causing Pollution			
		Textile	Engineering	Chemical	Electronics
Medical practitioners	55	0 (0%)	0 (0%)	55 (100%)	0 (0%)
Veterinary surgeons	4	0 (0%)	0 (0%)	4 (100%)	0 (0%)
Farmers	60	0 (0%)	0 (0%)	60 (100%)	0 (0%)
Managers	30	0 (0%)	0 (0%)	30 (100%)	0 (0%)
Trade Union leaders	15	0 (0%)	0 (0%)	15 (100%)	0 (0%)

**6.3.2** There is uniformity of opinion that industrial units especially chemical units in the area are responsible for industrial pollution in the area. Scientific studies prove that carbon dioxide, carbon monoxide, chlorine, fluorine and ammonia are gases which are emitted during industrial operations. The study conducted by Tharakan Mathai George showed the presence of chlorine, carbon dioxide, ammonia and fluorine in the Eloor-Edayar area (Tharakan Mathai George, 1976, p.15-19). According to the State Planning Board nearly 90% of air pollution in Kerala is mainly due to the chemical industrial units (Gopalakrishnan, P.K., 1978, p.55).

#### **6.4.0 Perception on the Nature/Types of Industrial Pollution**

**6.4.1** In an attempt at finding out the nature of pollution in the area, the various relevant segments were asked to identify the nature/types of industrial pollution in the Eloor-Kalamassery area. Table 6.4.1 provides information on this aspect.

**6.4.2** The respondents were unanimous in their opinion that there is air and water pollution. But, certain variations in the responses given by the various relevant segments were observed. According to medical practitioners, air, water, sound and radiation pollutions are prevalent in the area.

**Table 6.4.1 (6)**  
**Nature and Types of Pollution as Reported by**  
**Various Relevant Segments**

Various Segments	Total No. Sample/Population		Percentage of Endorsement by Various Segments on the Nature/Types of Pollution			
			Air	Water	Sound	Radiation
Medical practitioners	55	55 (100%)	55 (100%)	12 (21.82%)	6 (10.91%)	
Veterinary surgeons	4	4 ( " )	4 ( " )	NR*	NR*	
Farmers	60	60 ( " )	60 ( " )	NR*	30 (50%)	
Managers	30	30 ( " )	30 ( " )	NR*	15 (50%)	
Trade union leaders	15	15 ( " )	15 ( " )	5 (33.33%)	10 (66.67%)	

\*NR No Response.

Sound pollution has been stressed only by medical practitioners and trade union leaders. Special observation of trade union leaders on sound pollution could be due to the fact that they are the employees of the factory and the immediate victims of sound pollution. As for pollution due to radiation, we find 50-60% response from farmers, managers and trade union leaders. This observation might have arisen due to the newspaper publication of radiation pollution from Indian Rare Earths factory. Studies conducted in the area showed the presence of Air

pollution, (Tharakan Mathai George, 1976, p.23; NEERI, 1979, p.5; Sathesekumar, M.K. and Vallabhan, C.P.G., 1983, p.324) Water pollution, (NEERI, 1979, p.5; Kerala Economic Review, 1982, pp.238-239) and Radiation pollution (NEERI, 1979, p.5).

#### 6.5.0 Perception on the Consequences of Industrial Pollution

6.5.1 The sample of respondents from various segments were asked specific questions on the perceived ill effects of industrial pollution in the area. Table 6.5.1 provides data obtained on the adverse effects of pollution on man, animals, plants, property and climate.

Table 6.5.1 (7)  
Perception on the Adverse Effects of Pollution on the Receivers as Reported by the Various Relevant Segments

Segments	Total No. of Respondents (Sample/Population)	Percentage of Endorsement by Various Segments on the Adverse Effects of Pollution on				
		Man	Animals	Plants	Property	Climate
Medical practitioners	55	55(100%)	55(100%)	55(100%)	55(100%)	55(100%)
Veterinary surgeons	4	4(100%)	4(100%)	4(100%)	4(100%)	4(100%)
Farmers	60	60(100%)	60(100%)	60(100%)	60(100%)	60(100%)
Managers	30	30(100%)	30(100%)	30(100%)	30(100%)	30(100%)
Trade union leaders	15	15(100%)	15(100%)	15(100%)	15(100%)	15(100%)



**6.5.2** There is unanimous view among the respondents on the negative impacts of industrial pollution on man, animals, plants, property and climate. Several studies have been conducted by scientists to prove the known effects of industrial pollution on man, animals, plants, property and climate (Magill, Helden and Ashley, 1956, pp.2-8; Stern, Wehlers, Boubel and Lowry, 1972, p.122; Brooks, F. Peter, 1974, pp.107-133; Hodges Laurent, 1977, pp.9-14; Lipschutz, D. Ronnie, 1980, p.187)\*.

**6.6.0** Perceived Ill Effects of Industrial Pollution on the Health of Man as Reported by Medical Practitioners

**6.6.1** During this study an attempt was made to collect data from experts like medical practitioners on the adverse effects of pollution on the health of man.

**6.6.2** What categories of industrial employees frequently visit the medical practitioners who are directly or indirectly employed in the industrial units, and what are the categories of diseases often reported by them? Table 6.6.2 (a) provides the responses of medical practitioners on the categories of industrial employees and their family members who visit them for treatment.

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\* Chapter II of the thesis gives a detailed account of the studies conducted on the known effects of industrial pollution on the receivers.

**Table 6.6.2 (a) (8)**

**Categories of Industrial Employees and Their Family Members Who Frequently Visit the Medical Practitioners (Employed by Industrial Units) for Treatment of Diseases**

<b>Categories of Industrial Employees</b>	<b>Percentage of Endorsement by Medical Practitioners on Categories of Employees Who Go for Treatment</b> n = 10
<b>Workers</b>	<b>10 (100%)</b>
<b>Family members of workers</b>	<b>5 (50% )</b>
<b>Supervisors</b>	<b>9 (90% )</b>
<b>Family members of supervisors</b>	<b>4 (40% )</b>
<b>Managers</b>	<b>8 (80% )</b>
<b>Family members of managers</b>	<b>3 (30% )</b>

**6.6.3** According to the medical practitioners, the family members of the industrial employees are not as frequent visitors to medical practitioners directly or indirectly employed by the company as the employees themselves. Among the actual employees, workers are more frequent visitors to medical practitioners.

**6.6.4** The medical practitioners employed in industrial units are of the opinion that asthma, bronchitis, tuberculosis, dermatitis, allergic disorders and eosinophilia are commonly observed diseases among the industrial employees.

**Table 6.6.2 (b) (9)****Nature of Diseases Observed in Industrial Employees  
as Reported by Company Employed Medical Practitioners**

Nature of Diseases	Percentage of Endorsement by Medi- cal Practitioners on the Nature of Diseases in the area n = 10
1. Asthma ..	9 (90%)
2. Bronchitis ..	7 (70%)
3. Tuberculosis ..	7 (70%)
4. Dermatitis ..	6 (60%)
5. Allergic disorders ..	6 (60%)
6. Eosinophilia ..	5 (50%)

**6.6.5** Who frequently visit the local medical practitioners (all medical practitioners in the area including company employed medical practitioners) and who are the majority of patients from among various occupational categories? Data obtained on these aspects are presented in table 6.6.5.

**6.6.6** Table 6.6.5 shows that all the medical practitioners of the locality agree that industrial employees are their frequent patients. Fishermen, farmers and agricultural labourers are not as frequent visitors as the industrial employees, coolies, government employees, etc.

**Table 6.6.5 (10)****Responses Showing the Categories of People in the Area Who Frequently Visit the Local Medical Practitioners for Treatment**

<b>Categories of People</b>	<b>Percentage of Endorsement by Medical Practitioners on the Frequency of Visits in Rank Order</b> (N = 55)	
1. Industrial employees	55	(100%)
2. Coolies or physical labourers	45	(81.82%)
3. Government employees	39	(70.91%)
4. Self employed professionals	39	(70.91%)
5. Students	39	(70.91%)
6. Businessmen	35	(63.64%)
7. Managers/Supervisors	34	(61.82%)
8. Agricultural labourers	34	(61.82%)
9. Farmers	31	(56.36%)
10. Fishermen	28	(50.91%)

**6.6.7** To find out whether there is any variation in the various occupational categories visiting medical practitioners who differ in their professional experiences, the data have been presented in table 6.6.7 according to years of experience of medical practitioners.

**Table 6.6.7 (11)**  
**Responses Shown According to the Years of Experience**  
**of Medical Practitioners**

Categories of People	Percentage of Endorsement by Medical Practitioners on the Frequency of Visits					Rank Order
	Total Sample (55)	Less than 5 years = 25	Rank Order	6-10 Years = 12	More than 10 years = 17	
1. Industrial employees	55 (100%)	25 (100%)	1	12 (100%)	17 (100%)	1.5
2. Coolies or physical labourers	45 (81.82%)	17 (60%)	2	11 (84.62%)	17 (100%)	1.5
3. Government employees	39 (70.91%)	15 (60%)	4	8 (61.54%)	16 (94.12%)	4.5
4. Self employed professionals	39 (70.91%)	14 (56%)	5	9 (69.23%)	16 (94.12%)	4.5
5. Students	39 (70.91%)	16 (64%)	3	7 (53.85%)	16 (94.12%)	4.5
6. Businessmen	35 (63.64%)	12 (48%)	7	8 (61.54%)	15 (86.24%)	7.5
7. Managers/ Supervisors	34 (61.82%)	10 (40%)	9.5	9 (69.23%)	15 (86.24%)	7.5
8. Agricultural labourers	34 (61.82%)	12 (48%)	7	6 (46.15%)	16 (94.12%)	4.5
9. Farmers	31 (56.36%)	12 (48%)	7	7 (53.85%)	14 (82.35%)	9
10. Fishermen	28 (50.91%)	10 (40%)	9.5	5 (38.46%)	11 (64.71%)	10

**6.6.8**            **General observations of table 6.6.5 and 6.6.7**  
 showed a unanimous opinion among the medical practitioners  
 that industrial employees are their frequent visitors. It

could be noticed that the other categories are also frequent visitors but most of them have some special preference for the more experienced medical practitioners.

6.6.9 To find out whether there is much variation in the reporting of different categories of people to medical practitioners of varying experiences, the rank order correlation have been made use of.

6.6.10 The rank order correlation of various categories of people visiting less experienced and more experienced medical practitioners was found to be:

$$r = 1 - \frac{6 \left[ \sum d^2 + \frac{1}{12} (t^2 - t) \right]}{n (n^2 - 1)} \quad r = .67$$

.67 is found to be significant at 5% level. The rank order correlation by various categories of people visiting medical practitioners having less than five years of experience and medical practitioners having more than ten years of experience was .67 which was found to be significant at 5% level, indicating that experience of medical practitioners is not a factor to be considered on the categories of patients visiting the medical practitioners.

6.6.11 Most of the patients who came for treatment were residents of the Eloor-Kalamassery area according to the

majority of medical practitioners (80%) and that majority of the patients reporting to them for treatment were industrial employees.

6.6.12 What is the nature and frequency of disease prevalent in the area as observed and reported by the local medical practitioners? What are the pronounced diseases? Table 6.6.12 presents the data obtained on this aspect.

Table 6.6.12 (12)

Nature of Diseases and their Frequency as Observed by Local Medical Practitioners

Nature of Disease	Percentage of Endorsement on the Nature of Disease as Observed by the Medical Practitioners					
	Total No. of Sample (N = 55)	Less than 5 years (N = 25)	Rank 5 or	6 - 10 Years (N = 13)	More than 10 Years (N = 17)	Rank Order
1. Asthma	47 (85.45%)	18 (72%)	2.5	12 (92.31%)	17 (100%)	1.5
2. Bronchitis	47 (85.45%)	19 (76%)	1	11 (84.62%)	17 (100%)	1.5
3. Allergic disorders	44 (80%)	18 (72%)	2.5	12 (92.31%)	14 (82.35%)	3.5
4. Eosinophilia	33 (60%)	13 (52%)	6.0	8 (61.54%)	12 (70.59%)	4.0
5. Dermatitis	31 (56.36%)	14 (56%)	4.5	6 (46.15%)	11 (64.71%)	5.0
6. Gastric irritation	28 (50.91%)	14 (56%)	4.5	6 (46.15%)	8 (47.06%)	6.5
7. Tuberculosis	23 (41.82%)	8 (32%)	7.0	7 (53.85%)	8 (47.06%)	6.5
8. Tonsillitis	14 (25.45%)	5 (20%)	9.0	2 (15.38%)	7 (41.18%)	8.0
9. Ear problems	12 (21.82%)	6 (24%)	8.0	2 (15.38%)	4 (23.53%)	9.5
10. Hypertension	9 (16.36%)	2 (8%)	10.0	3 (23.08%)	4 (23.53%)	9.5

**6.6.13** Analysis of table 6.6.13 showed a conspicuous general opinion among the medical practitioners that asthma, bronchitis and allergic disorders are the prevalent diseases in the area. Studies conducted by George Mathai Tharakan in 1976 showed that bronchitis, acute nasopharyngitis and asthma were common diseases in the Eloor-Edayar area. (Tharakan Mathai George, 1976, p.42).

**6.6.14** To find out whether there is much variations in the nature of diseases reported by medical practitioners of varying experiences, the rank order correlation method was used. The rank order correlation of nature of disease as observed by less experienced and more experienced medical practitioners was found to be 0.75 which is found to be significant at 5% level indicating insignificant variations in their opinions.

**6.6.15** More than eightyfive percent of the medical practitioners are of the opinion that asthma is the most pronounced disease. Hypertension, ear problems and tonsillitis were the least pronounced diseases in the area.

**6.6.16** In an attempt at finding out the factors responsible for the occurrence of certain types of diseases, the respondents were asked to specify the detrimental factors in pollution responsible for the common occurrence of the diseases. Table 6.6.16 shows the responses of medical practitioners on this aspect.



**Table 6.6.16 (13)**  
**Detrimental Factor on Human Health: Response by the**  
**Local Medical Practitioners**

Detrimental Factor	Percentage of Endorsement from Medical Practitioners of Varying Experience on the Detrimental Environmental Factors on Human Health					
	Total No. N = 55	Less than 5 years N = 25	Rank Ord- er	6-10 Years N = 13	More than 10 Years N = 17	Rank Ord- er
1. Chlorine	43 (78.18%)	22 (88%)	1	9 (69.23%)	12 (70.59%)	1
2. Sulphur dioxide	38 (69.09%)	16 (64%)	2	10 (76.92%)	12 (70.59%)	2
3. Sulphuric acid	32 (58.18%)	15 (60%)	4	6 (46.15%)	11 (64.71%)	3
4. Ammonia	27 (49.09%)	18 (72%)	2	6 (46.15%)	3 (17.65%)	6.5
5. D D T	26 (47.27%)	11 (44%)	5	8 (61.54%)	7 (41.18%)	5
6. Carbon monoxide	25 (45.45%)	10 (40%)	6	7 (53.85%)	8 (47.06%)	4
7. Mercury	13 (23.64%)	9 (36%)	7.5	4 (30.77%)	0 (0%)	9
8. Fluorine	12 (21.82%)	9 (36%)	7.5	2 (15.38%)	1 (5.9%)	8
9. Radiation	6 (10.91%)	2 (8%)	9	1 (7.69%)	3 (17.65%)	6.5

6.6.17 An observation of the above table shows that majority of the local medical practitioners consider chlorine as the most detrimental factor to human health. Several scientific studies have established that chlorine, sulphur dioxide and other chemical factors are responsible for the occurrence of certain diseases (Seinfeld, H. John, 1974, p.20; Hedges Laurent, 1977, pp.328-329; Lipschutz Ronnie, 1980, p.25 and Nobel Bernard, 1981, p.375).

**6.6.18** Besides chlorine it could be noticed that the other factors are also harmful to health, according to observations of medical practitioners. To find out whether there is variation on the perception of these environmental factors harmful to health, among the local medical practitioners of varying experiences, the rank order correlation was worked out. The rank order correlation thus obtained is only 0.61 which is not found significant at 5% level indicating that there are differences of opinion on these factors among the less experienced and more experienced medical practitioners. The difference of opinion is on the ill effects of ammonia, radiation, mercury and carbon monoxide.

**6.6.19** What is the long term effect of pollution on human health, even in the absence of conspicuous disease symptoms? Table 6.6.19 provides data on this aspect as reported by the medical practitioners.

**6.6.20** Again, irrespective of years of experience the majority of medical practitioners say that chronic diseases may occur. Chapter II of the thesis showed some of the studies where long term effects of pollution lead to chronic diseases (Hedges Laurent, 1977, p.12; Julian Joseph, 1980, p.531; Lipschutz Reanie, 1980, p.18).

**Table 6.6.19 (14)****Long Term Effects of Pollution as Perceived by the Local Medical Practitioners**

Long Term Effects	Percentage of Endorsement by Medical Practitioners of Varying Experiences on the Long Term Effects of Pollution on Human Health			
	Total No. N = 55	Less than 5 Years N = 25	6-10 Years N = 18	More than 10 Yrs. N=17
1. Chronic diseases may often occur due to lack of early preventive measures	39 (70.91%)	20 (80%)	13 (92.31%)	7 (41.18%)
2. Minor but recurring diseases may occur	12 (21.82%)	4 (16%)	6 (46.18%)	2 (11.76%)
3. People become health conscious and take preventive measures	4 (7.27%)	2 (8%)	2 (15.38%)	0 (0%)

**6.6.21**                    **What is the professional opinion on the curative part of diseases caused by environmental pollution?**  
**Table 6.6.21 shows the observations of medical practitioners on such pollution caused diseases.**

**6.6.22**                    **Based on professional experience majority of the local medical practitioners say that there is no cure for diseases caused by environmental pollution. On the other**

Table 6.6.21 (15)Curative Part of Diseases Caused by Environmental Pollution as Reported by Medical Practitioners

Disease Caused by Environmental Pollution	Percentage of Endorsement by Medical Practitioners on the Curative Part of Disease			
	Total No. (Sample) N = 55	Less than 5 Years N = 25	6-10 Years N = 13	More than 10 Years N = 17
Cannot be cured	38 (69.09%)	15 (60%)	7 (53.85%)	16 (94.12%)
Can be cured	17 (30.91%)	10 (40%)	6 (46.15%)	1 (5.88%)

hand a small percentage of medical practitioners believe that such diseases could be cured. The more experienced medical practitioners are of the view that such diseases cannot be cured.

**6.6.23** If there is no cure for diseases caused by environmental pollution what substitute treatments do the medical practitioners recommend? Table 6.6.23 presents the data obtained from the medical practitioners.

**6.6.24** Majority of the medical practitioners recommend symptomatic treatment of the patient. Other recommendations are taking preventive measures, changing the nature of job and changing the residence from industrial areas to unpolluted areas.

**Table 6.6.21 (16)**  
**Possible Substitute Treatments, According to the**  
**Medical Practitioners**

Substitute Treatment	Percentage of Endorsement by Medical Practitioners on the Substitute Treatment			
	Total No. of Doctors N = 55	Less than 5 Years N = 25	6-10 Years N = 13	More than 10 Years N = 17
1. Symptomatic treatment	22 (40%)	8 (32%)	5 (38.46%)	9 (52.94%)
2. a) Any other: changing the nature of the job	4 (7.27%)	3 (12%)	NR	1 (5.88%)
b) Change of residence	2 (3.64%)	2 (8%)	NR	NR
c) Taking preventive measures	10 (18.18%)	10 (40%)	NR	NR

**6.7.0 Perceived Ill Effects of Industrial Pollution on the Health of Domestic Animals as Reported by Veterinary Surgeons**

**6.7.1** In an attempt to find out the consequences of industrial pollution on animals a questionnaire was prepared for eliciting responses from the veterinary surgeons of the area. The number of veterinary hospitals in the Kloor-Kalemassery area is quite limited. There is only four veterinary hospitals with one veterinary surgeon for each hospital.

**6.7.2**            **Animals are also victims of environmental pollution. Some types of pollutions are known to affect animals, but do not appear to affect humans and vice versa (Hedges Laurent, 1977, p.9).**

**6.7.3**            **Types of animals brought for treatment as per the reports of veterinary surgeons in Kloor-Kalamassery area are presented in table 6.7.3.**

**Table 6.7.3 (17)**

**Types of Animals Brought to the Veterinary Surgeons for Treatment from Kloor-Kalamassery Area**

<b>Types of Animals</b>	<b>Percentage of Endorsement by Veterinary Surgeons on the Types of Animals Brought for Treatment</b>
	<b>N = 4</b>
<b>Cows</b>	<b>4 (100%)</b>
<b>Buffaloes</b>	<b>4 (100%)</b>
<b>Fowls</b>	<b>4 (100%)</b>
<b>Goats</b>	<b>3 (75%)</b>
<b>Pigeons</b>	<b>3 (75%)</b>
<b>Lovebirds</b>	<b>3 (75%)</b>
<b>Dogs</b>	<b>2 (50%)</b>
<b>Cat</b>	<b>1 (25%)</b>
<b>Horse</b>	<b>1 (25%)</b>
<b>Elephant</b>	<b>1 (25%)</b>
<b>Ducks</b>	<b>1 (25%)</b>

6.7.4 There is unanimous opinion among the veterinary surgeons that cows, buffaloes and fowls are the animals that are commonly brought from the area for treatment. While cat, horse, elephant and ducks are seldom brought for treatment. Studies conducted by George Mathai Tharakan show that cattle, buffaloes and goats are the most affected animals in the locality (Tharakan Mathai George, 1976, p.471).

6.7.5 The respondents were asked to specify the nature of disease prevalent in the Kloor-Kalamassery industrial area. Data obtained on this aspect are given in table 6.7.5.

Table 6.7.5 (18)

Perception of Veterinary Surgeons on the Nature of Diseases Observed in Animals in the Kloor-Kalamassery Area

Nature of Disease	Percentage of Endorsement by Veterinary Surgeons on the Nature of Diseases Observed in Animals (N = 4)
Fluorosis	4 (100%)
Poor Milk yield	4 (100%)
Respiratory diseases	4 (100%)
Gastro intestinal disorders	4 (100%)
Thin shelled eggs	3 (75%)
Skin diseases	3 (75%)
Infertility	3 (75%)
Diarrhoea	3 (75%)
Mottling of teeth	3 (75%)
Abortion	2 (50%)

6.7.6 Several studies on the effects of pollution on animals have shown the presence of acute bronchiolitis, emphysema and heart failure (Brooks, F. Peter, 1974, p.127), fluorosis which lead to weight loss and lameness (Faith, W.L., 1972, p.14) and diseases associated with respiratory systems of animals (Hodges Laurent, 1977, p.57).

6.7.7 The respondents mentioned the following detrimental factors that affect health of animals as a consequence of environmental pollution. Table 6.7.7 provides the data obtained on this aspect.

Table 6.7.7 (19)  
Detrimental Factors as Reported by Veterinary Surgeons

Detrimental Factor	Percentage of Endorsement as Reported by Veterinary Surgeons on the Detri- mental Factors
Fluorine	4 (100%)
Sulphur dioxide	3 (75%)
Carbon monoxide	2 (50%)
Chlorine	1 (25%)
Sulphuric acid fumes	1 (25%)
D.D.T.	1 (25%)
Arsenic	1 (25%)
Ammonia	1 (25%)



**6.7.8** There is unanimous opinion among the veterinary surgeons that fluorine is considered to be the factor most harmful to the health of animals. The next detrimental factor in importance according to veterinary surgeons is sulphur dioxide. Laboratory researches on animals showed that fluorine and sulphur dioxide are the major pollutants which affect animals. The conditions under which animals get poisoned by pollutants are entirely different from that of human beings. Health hazards occur when animals graze in areas where grasses are contaminated with fluoride dusts or when fluoride compounds are absorbed from the atmosphere through breathing. When animals drink contaminated river water they are also susceptible to ingestion of the pollutant. Studies on the effect of fluorine on livestock (Brooks, F. Peter, 1974, p.128) and effect of sulphur dioxide on respiratory tract of animals (Nodges Laurent, 1977, p.57) indicate the harmful effect of these pollutants on the health of animals.

**6.7.9** The respondents were asked on the long term effect of environmental pollution on the health of animals. Table 6.7.9 presents the responses of veterinary surgeons on this aspect.

**6.7.10** All the veterinary surgeons in the Kloor-Kalamassery area are unanimous in their opinion that chronic diseases occur as a result of long term effects of environmental pollution. A study by Brooks shows a high fluorine

**Table 6.7.9 (20)****Long Term Effect of Environmental Pollution on Health of Animals**

<b>Long Term Effect</b>	<b>Percentage of Endorsement by Veterinary Surgeons on the Long Term Effect of Environmental Pollution on Animals N = 4</b>
1. Chronic diseases	4 (100%)
2. Minor diseases	0 (0%)

in-take over a period of time causes lameness and in advanced cases loss of appetite, diarrhoea, weightloss, infertility and poor yield in cows and sheep (Brooks, F. Peter, 1974, p.128).

6.7.11 An attempt was made to find out whether there was any cure for diseases caused by environmental pollution. Table 6.7.11 shows the response on the curative nature of diseases caused by pollution.

**Table 6.7.11 (21)****Curative Nature of Diseases Caused by Pollution as Reported by the Veterinary Surgeons**

<b>Curative Nature of Diseases Caused by Environmental Pollution</b>	<b>Percentage of Endorsement as Reported by Veterinary Surgeons on the Curative Nature of Diseases Caused by Pollution</b>
Cannot be cured	4 (100%)
Can be cured	0 (0%)



6.7.12 Table 6.7.11 show that there is unanimous view among the veterinary surgeons in Kloor-Kalamassery area that diseases caused by industrial pollution cannot be cured.

6.8.0 Perceived Ill Effects of Industrial Pollution on Plants and Trees as Reported by Farmers

6.8.1 Attempts have been made on the basis of data collected from farmers to study their awareness of industrial pollution and the problems created as a result of the presence of a large number of industries in the locality. The responses so obtained have been presented in table 6.8.1.

Table 6.8.1 (22)  
Negative Effects of Industrial Pollution as Perceived by the Farmers of Kloor-Kalamassery Area

Negative Effects of Industrial Pollution	Percentage of Endorsement as Reported by Farmers on the Negative Effects of Industrial Pollution
1. Causes diseases to people/ animals/plants	60 (100%)
2. Destruction of vegetation	60 (100%)
3. Poor yield from land/ animals	60 (100%)
4. Uninhabitable place for people	60 (100%)
5. Smoky atmosphere	60 (100%)
6. Polluted waterways	60 (100%)

**6.8.2**            **The farmers of the locality are unanimous in their opinion that the presence of a large number of chemical industries nearby causes environmental pollution problems to man, animals, plants, property and climate. Two studies have been reported on the ill effects of industrial pollution on the plants in the Kloor-Kalamassery area (Mony, N.S., 1974; Tharakan Mathai George, 1976, p.52). These studies support the observations made under items 1, 2 and 3 in table 6.8.1.**

**6.9.0**            **Perceived Ill Effects of Industrial Pollution on Man, Animals, Plants, Materials and Climate as Reported by Worker Trade Union Leaders**

**6.9.1**            **Exploration on the perception of workers regarding nature, sources and consequences of industrial pollution is very relevant, for they are the immediate victims of industrial pollution. Since it was difficult to take a sample of all the workers in the area, the researcher confined the study to worker trade unions from three major chemical units in the Kloor-Kalamassery area. Data obtained on the perception of the consequences of pollution are given in table 6.9.1.**

**6.9.2**            **There is unanimous view among the worker trade union leaders that the consequence of industrial pollution are adverse on man, animals, plants, materials and climate.**

**Table 6.9.1 (23)****Perception of the Consequences of Industrial Pollution on Men, Animals and Plants**

<b>Ill Effects of Industrial Pollution on the Following Categories</b>	<b>Percentage of Endorsement as Reported by Worker Trade Unions on the Ill Effect of Pollution</b>
Men	15 (100%)
Animals	15 (100%)
Plants	15 (100%)
Materials	15 (100%)
Climate	15 (100%)

6.9.3 On the nature and types of pollution in the area, all the worker trade union leaders agree that there are air pollutions and water pollutions as evident from the data given in table 6.9.3.

**Table 6.9.2 (24)****Nature and Types of Pollution in the Area as Perceived by Worker Trade Union Leaders**

<b>Nature and Types of Pollution</b>	<b>Percentage of Endorsement as Reported by Worker Trade Union Leaders on the Nature and Types of Pollution</b>
Air	15 (100%)
Water	15 (100%)
Radiation	10 (66.67%)
Sound	5 (33.33%)

6.9.4           The above table show that radiation pollution and sound pollution are not completely endorsed by all the respondents. Respondents who reported the presence of sound pollution are a minority in the group.

6.9.5           It is interesting to observe that veterinary surgeons, farmers and managers did not report the presence of sound pollution in the area. Only worker trade union leaders and medical practitioners are aware of the presence of sound pollution. Regarding radiation pollution except veterinary surgeons all other categories have endorsed the presence of pollution due to radiation. And the worker trade union leaders are more conscious about radiation pollution than any other category. In other words everyone in the area is aware of air and water pollution but radiation pollution and sound pollution are not as conspicuous as the air and water pollution.

6.10.0       Perceived Ill Effects of Industrial Pollution on Man, Animals, Plants, Materials and Climate as Reported by Managers

6.10.1       Senior and middle level managers from three major chemical units in the area who responded to the questionnaire are unanimous in their view that there is the presence of air and water pollution in the area. But only

50 per cent of them perceive the presence of radiation pollution. Table 6.10.1 below shows the data on the awareness of the nature and types of pollution in the Kloor-Kalamassery area.

Table 6.10.1 (25)  
Nature of Pollution as Reported by Managers  
of the Area

Nature and Types of Pollution	Percentage of Endorsement as Re- ported by Managers on the Nature and Types of Pollution in the Area
Air	30 (100%)
Water	30 (100%)
Radiation	15 ( 50%)

6.10.2            Regarding the adverse effects of industrial pollution on man, animals, plants, materials and climate all the thirty managers agree that industrial pollution has negative effects on man, animals, plants etc. Table 6.10.2 presents their responses on the adverse effects of industrial pollution on the receivers.

6.10.3            Summary of conclusion on the perception of nature, sources and consequences of industrial pollution by various relevant segments of the public are given in 6.11.0 below.

**Table 6.10.2 (26)**  
**Perception of Managers on the Effect of Industrial**  
**Pollution on the Receivers**

<b>Adverse Effects of Industrial Pollution</b>	<b>Percentage of Endorsement as Reported by Managers on the Adverse Effect of Pollution on the Receivers</b>
Man	30 (100%)
Animals	30 (100%)
Plants	30 (100%)
Materials	30 (100%)
Climate	30 (100%)

**6.11.0 Summary of Conclusions on Perception of Nature,  
Source and Consequences of Industrial Pollution**

**6.11.1** Medical practitioners, veterinary surgeons, farmers, managers and trade union leaders residing in the Kloor-Kalamassery area are unanimous in their view that there exists industrial pollution in the area (table 6.3.3).

**6.11.2** There is uniformity of opinion among all the categories of respondents that the chemical industries in the area are responsible for the presence of industrial pollution in the area (table 6.3.1 (a) and table 6.3.1 (b)).

**6.11.3** Regarding the nature of pollution, all the respondents of all the categories mentioned air and water pollutions. However, only medical practitioners and trade union leaders pointed out the presence of sound pollution.



Except veterinary surgeons, all other categories have also mentioned the presence of radiation pollution (table 6.4.1).

6.11.4 All the relevant segments of the public in the area are unanimous in their view that industrial pollution has adverse effects on man, animals, plants, property and climate (table 6.5.1).

6.11.5 The family members of the industrial employees (workers, supervisors and managers) are not as frequent visitors to medical practitioners directly or indirectly employed by the company as the employees themselves. Among the actual employees, workers are more frequent visitors to medical practitioners (table 6.6.2).

6.11.6 Frequent diseases observed among the industrial employees and reported by the medical practitioners are Asthma, Bronchitis and tuberculosis (table 6.6.3).

6.11.7 According to the medical practitioners of the Eloor-Kalamassery area, industrial employees and coolies (physical labourers) are the frequent visitors as patients (table 6.6.5).

6.11.8 Analysis of the background of medical practitioners in terms of experience of practice does not

reveal any significant difference on various categories of people reporting to them. The rank order correlation of various categories of people visiting them, between less (less than 5 years) experienced medical practitioners and more experienced medical practitioners (more than 10 years) was .67 which was found to be significant at 5 per cent level (table 6.6.7).

6.11.9            The commonly observed diseases among the local people, according to the medical practitioners are asthma, bronchitis and allergic disorders (table 6.6.12). No significant difference could be found between less experienced and more experienced medical practitioners on their assessment regarding the nature of diseases observed among the patients.

6.11.10           Chlorine and sulphur dioxide were considered as major detrimental factors to human health, according to the medical practitioners of the area (table 6.6.16). The expert opinions of the medical practitioners, however, are not uniform, for the rank order of differences between less experienced medical practitioners and more experienced medical practitioners is only .61 which is not found significant at 5 per cent. The difference of opinion is on the effects of ammonia, radiation, mercury and carbon monoxide.

**6.11.11** According to medical practitioners of the area, long term effect of industrial pollution on human health is the occurrence of chronic disease due to lack of early preventive measures (table 6.6.19).

**6.11.12** According to more experienced medical practitioners in the area, diseases caused by environmental pollution cannot be cured. However medical practitioners with less experience are not as pessimistic as the more experienced medical practitioners, for 40 per cent of them think that such diseases can be cured (table 6.6.21).

**6.11.13** Majority of the medical practitioners advocate symptomatic treatment and taking preventive measures for the cure of disease caused by environmental pollution (table 6.6.23).

**6.11.14** On the ill effects of industrial pollution on domestic animals, veterinary surgeons report that fluorosis, respiratory diseases and gastro intestinal disorders were found common among cows and buffaloes (table 6.7.3 and table 6.7.5).

**6.11.15** The veterinary surgeons are of the opinion that fluorine and sulphur dioxide are the major detrimental factors to the health of domestic animals (table 6.7.7).

**6.11.16** Long term effect of environmental pollution on animals according to veterinary surgeons is chronic diseases (table 6.7.8) and they feel that diseases caused by environmental pollution cannot be cured (table 6.7.11).

**6.11.17** The farmers of the locality are of the opinion that the presence of a large number of chemical industry nearby cause environmental pollution problems to man, animals, plants, materials and climate (table 6.8.1).

**6.11.18** All the worker trade union leaders of three chemical units are unanimous in their view that industrial pollution has negative effects on man, animals, plants, materials and climate (table 6.9.1).

**6.11.19** Regarding air and water pollution the worker trade union leaders have a unanimous opinion, but radiation and sound pollution are not completely endorsed by all the respondents (table 6.9.3).

**6.11.20** The managers of the locality are unanimous that there is air and water pollution but only fifty per cent of them perceive the presence of radiation pollution (table 6.10.1).

**6.11.21** All the thirty managers are unanimous that industrial pollution has adverse effects on man, animals, plants, materials and climate (table 6.10.2).

**CHAPTER - VII****7.0.0 REACTIONS TO ENVIRONMENTAL POLLUTION BY CERTAIN RELEVANT SEGMENTS OF THE PUBLIC IN THE ELOOR-KALAMASSERY INDUSTRIAL BELT****7.1.0 Introduction**

7.1.1 Local farmers, professionals, worker trade union leaders and managers in the Eloor-Kalamassery area were of various problems associated with industrial pollution in the area. How did these relevant segments of the population in the area react to industrial pollution problems? Did they resort to individual and/or collective efforts to solve the problem either directly by focussing their attention on pollution producing units or indirectly by influencing the source through the government and/or judiciary? What tactics and strategies did they adopt in their attempt at solving or minimising the problem? Their reactions to environmental problems and action programmes resorted to are discussed in the chapter with primary data collected from the area.

7.1.2 Direct and indirect actions by individuals and pressure groups for redressing their grievances caused by industrial pollution: A model: Fig. 7.1.2 below depicts a model of the possible action programmes by individual pressure groups: either directed to the source of <sup>pollution</sup> or indirectly aimed at

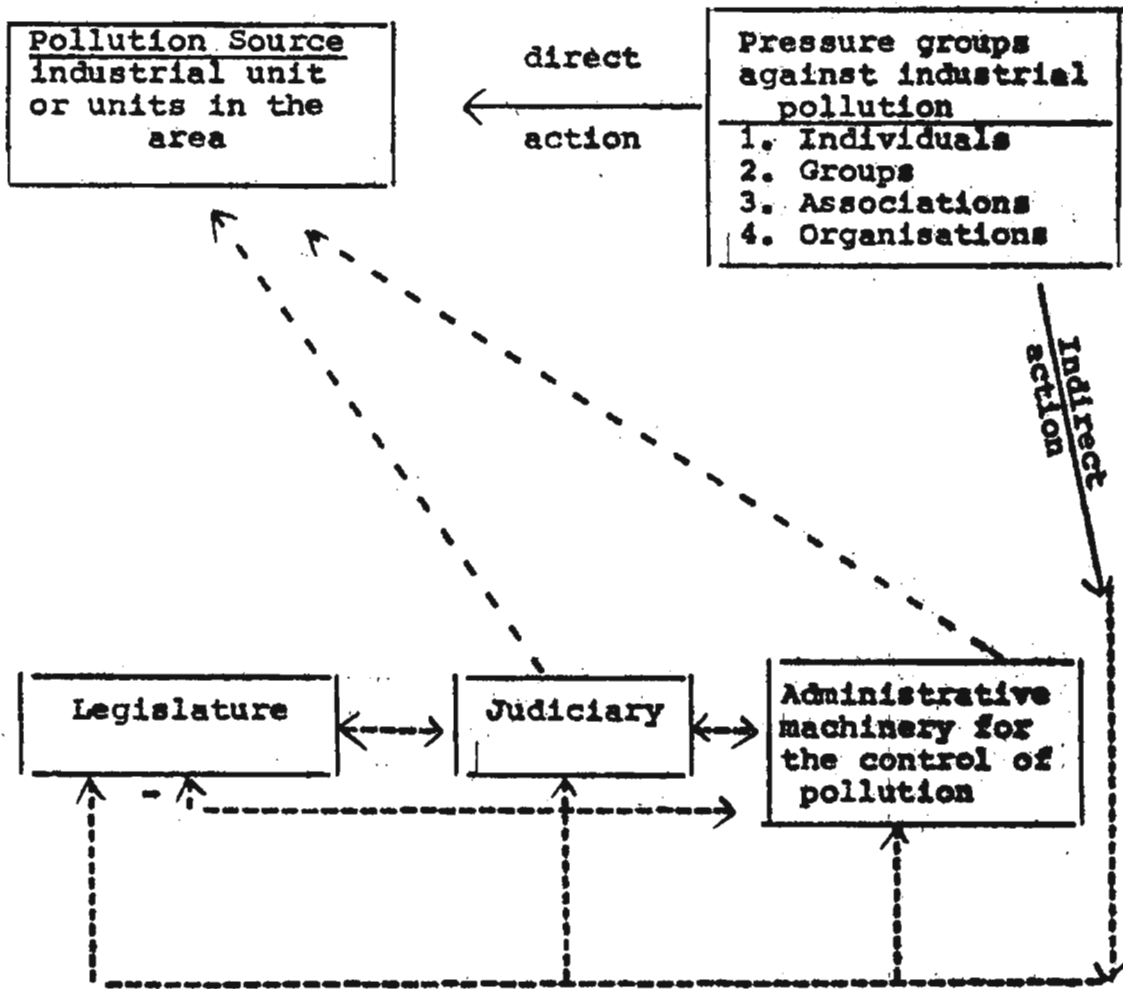


Fig. 7.1.2 (3)

A model of the possible Action Programmes used by individual pressure groups

influencing the pollution control machineries of the government, the judiciary and/or the public and government for enactment of suitable environmental laws for the safety and protection of the people.

7.1.3           The model given above represents a process starting at the pollution generating source. Individuals, groups and associations reacting to the problems of environmental pollution may either resort to direct action against the industrial units assumed to be responsible for industrial pollution or resort to indirect action programmes through the administrative machineries for the control of pollution i.e., the Water and Air Pollution Control Boards. Another indirect method of influencing the management of pollution generating units is through the judiciary by environmental litigation with a plea to direct the management to comply with norms and regulations stipulated for maintaining an environment free from harmful industrial pollution. Besides the judiciary system and administrative machineries of the government, the public in general, pressure groups in particular and political parties can influence the government for enacting new legislations for the protection of the health and safety of people.



**7.2.0 Reactions to Industrial Pollution at the Individual Level by Certain Affected Parties**

**7.2.1** The situation under which human beings get affected by industrial pollution is entirely different from that of plants. In the case of the former, some of the diseases prevalent in the area dis as a result of long term exposure to certain pollutants and hence it is difficult to take action on the source without adequate data to substantiate that the disease has occurred as a result of one particular pollutant discharged from the industrial unit. Moreover, the concentration of industries in one selected area makes it difficult to locate the exact chemical unit responsible for emitting specific pollutants. In the case of plants, when particular pollutants from an industry get discharged into the air, water or land it damages the crops and causes loss to the farmer. So a farmer who finds his crops ruined by the polluting action of an industry can directly approach the concerned industrial unit with his grievances. An attempt have been made to obtain data from farmers on their action programmes to redress their personal grievances due to the presence of industrial pollution.

**7.2.2** 120 questionnaires were distributed among the farmers of the Eloor-Kalamassery area. The analysed data of 60 farmers who responded to the questionnaire showed that 83.33 per cent (50) of the farmers have personally lodged

complaints against the management of the industries assumed to be responsible for pollution. Individual farmers have resorted to submitting memoranda to the management of the company and/or <sup>to</sup> legal action against the company. The remaining 16.67 per cent (10) of the respondents did not make any complaint inspite of their awareness of damages caused to their crops by industrial pollution.

7.2.3 The 50 respondents who had personally resorted to some action programmes against the agencies responsible for pollution were asked to specify the nature of action resorted to for redressing their grievances. Table 7.2.3 presents the data obtained on this aspect.

Table 7.2.3 (1)

Actions Resorted to by Individual Farmers for Redressing their Grievances

Actions resorted to	Percentage of endorsement by farmers on actions resorted to N = 50
Submission of Memoranda -	45 (90%)
Legal procedure (Litigation) -	5 (10%)
Dharna -	4 (8%)
Newspaper publications -	4 (8%)

**Note:** The respondents were permitted to tick more than one category of action programmes listed.

7.2.4           Ninety per cent of the farmers submitted memoranda to the concerned management of industrial units on damages caused to their crops by industrial pollution. Ten per cent of the respondents resorted to legal procedures while eight per cent of farmers resorted to direct action like dharna and another eight per cent of the respondents resorted to newspaper publications on the damages caused to their crops by the industries in the area.

7.2.5           The attitude of the management to the demands as reported by the farmers is presented in the table 7.2.5.

Table 7.2.5 (2)

Attitude of the Management to the Demands/Protests of Farmers as Reported by Individual Farmers.

Attitude of Management	Percentage of endorsement by farmers on the attitude of management to their demands N = 50	
Defensive in their position -	31	(62%)
Indifferent -	13	(26%)
Tried to please by other means -	12	(24%)
Tried to give compensation -	3	(6%)
Sympathetic -	0	(0%)
Positive with follow up action -	0	(0%)

7.2.6 The management of the concerned chemical units have been quite defensive in their position as stated by 31 of the farmers. None of the respondents said that the management was sympathetic or positive in their approach.

7.2.7 The farmers of the Eloor-Kalamassery area had utilized other means by which their grievances could be redressed by the concerned authorities for damages caused by industrial effluents. Table 7.2.7 presents the data obtained on this aspect.

Table 7.2.7 (3)

Authorities to whom the Farmers had Approached with  
Their Grievances

Concerned authorities	Percentage of endorsement by farmers on the authorities to whom grievances were submitted N = 50	
<b>I <u>Government agencies</u></b>		<b>20 (40%) Total</b>
a) Collectorate	- 9 (18%)	
b) Irrigation Department	- 6 (12%)	
c) Eloor Panchayat	- 5 (10%)	
<b>II <u>Political parties</u></b>		<b>12 (24%) Total</b>
a) C.P.I (Marxists)	- 9 (18%)	
b) Congress (I)	- 3 (6%)	
<b>III <u>Local associations</u></b>	- 0 (0%)	
<b>IV <u>Trade unions of Industrial units</u></b>	- 0 (0%)	
<b>V <u>Local associations of farmers</u></b>	- 0 (0%)	
<b>VI <u>Local association for the protection of environment</u></b>	- 0 (0%)	
<b>VII <u>Did not approach any other agency with their complaints</u></b>		<b>18 (36%) Total</b>

**7.2.8** Thirtysix per cent of the respondents did not approach any agency with their complaints. Forty per cent approached the government agencies such as Collectorate, Irrigation Department and Eloor Panchayat. Twentyfour per cent of the respondents tried to get the support of local political parties. All the respondents reported that there was no local association to protect their interests and the only local association for the protection of environment was the members of Eloor panchayat according to ten per cent of the respondents.

**7.2.9** Table 7.2.9 below presents data on the reaction of government agencies to the requests of the aggrieved as reported by the farmers.

Table 7.2.9 (4)

Reaction of Government Agencies to the Requests of  
Farmers

Reactions	Percentage of endorsement by the farmers on the reactions of government agencies N = 20	
1. Oral support with no follow-up action	-	11 (55%)
2. Ignored/Indifferent	-	5 (25%)
3. Positive with follow-up action	-	3 (15%)
4. Sympathetic	-	1 (5%)

**7.2.10** According to 55 per cent of the respondents the agencies of the government resorted to verbal support with no follow-up action. Twentyfive per cent of the respondents reported that the government agencies ignored their grievances while 15 per cent of the respondents reported that the government agencies were really helpful to them. One respondent (5%) reported that the government agency was sympathetic, but helpless in taking up the matter for the redressal of their grievances.

**7.2.11** The data presented in table 7.2.7 categories 'local association for farmers' and 'local association for the protection of environment' clearly indicate the absence of organised groups or associations for protecting the interest of farmers. In the light of the above findings questions relating to the structure, role, tactics and strategies of environmental protection pressure groups functioning in Eloor-Kalamassery area could not be discussed in detail. However, the researcher extended the study on this aspect on all Kerala-basis by collecting data from voluntary agencies and organisations for the purpose of protecting the environment.

**7.2.12** Suggestions and comments of farmers in the Eloor-Kalamassery area on the problems of industrial pollution are summarised below in table 7.2.12.

Table 7.3.12 (5)

Suggestions/Comments on the Problems of Industrial  
Pollution as given by the Farmers of the Eloor-  
Kalamassery Area

<u>Suggestions/Comments on Industrial Pollution</u>	<u>Percentage of endorsement by farmers N = 60</u>
1. The presence of air and water pollution is just intolerable and, as a result, crops were destroyed	- 60 (100%)
2. The lands which were once fertile are now useless due to air and water pollution. This has prevented me from doing paddy cultivation.	- 60 (100%)
3. Due to polluted air and water man has become the victim of diseases.	- 60 (100%)
4. Pollution is present everywhere, air, water and land	- 60 (100%)
5. The intake of poisonous gases is making man die even before his normal life span.	55 (92%)
6. The fresh air around Eloor has become polluted due to the introduction of poisonous gases. Visibility is poor on certain occasions; man has become a victim of pollution. It is time that we are saved, by some action programme against pollution.	- 53 (88.33%)
7. Many times, samples of water have been taken by the industries. So far nothing has been done. Why this silence on the part of the authorities?	- 51 (85%)

7.2.13 The above remarks by farmers were listed by a content analysis of their statement on item 19.0 of the questionnaire.

7.2.14 The above comments by farmers clearly indicate their helplessness as victims of industrial pollution. They feel agitated with the present state of environment. None of them have any concrete suggestion for the solution of problems created by industrial pollution.

### 7.3.0 Reaction to Industrial Pollution by Professionals

7.3.1 In an attempt at finding out the reaction of medical practitioners and veterinary surgeons to the perceived problems of environmental pollution in the area, data relevant to several issues were collected from these professionals. Suggestions of these medical practitioners for the elimination of detrimental effects of industrial pollution are given in table 7.3.1.

7.3.2 Nearly 73 per cent of medical practitioners recommended legislations on environmental hygiene. More than 67 per cent of the respondents recommended neutralising the pollution effect at the industrial unit level. Majority of the medical practitioners did not endorse the view that there is no possibility for a better environment under the present conditions.



**Table 7.3.1 (6)**

**Suggestions of Medical Practitioners for Eliminating  
the effect of Environmental Pollution on health/  
diseases**

Suggestions		Percentage of endorsement by medical practitioners in the area N = 55	
1. Legislations on environmental hygiene	-	40	(72.73%)
2. Neutralising the pollution effect at the industrial unit level	-	37	(67.27%)
3. Maintenance of environmental hygiene by local bodies	-	34	(61.82%)
4. Regular medical check-up of people in the area	-	32	(58.18%)
5. Removal of the person from the source of pollution	-	30	(54.55%)
6. Detecting the pollutants that cause diseases and concerted efforts by all agencies for neutralizing the effect of such pollutants	-	30	(54.55%)
7. Availability of modern medical facilities	-	25	(45.45%)
8. Grow more trees	-	21	(38.18%)
9. No possibility for a better environment under the present conditions	-	13	(23.64%)

**7.3.3 Individual suggestions and personal comments of the respondents for maintaining better environmental hygiene are summarised in table 7.3.3.**

**Table 7.3.2 (7)****Individual Suggestions and Personal Comments of Medical Practitioners for Maintaining Environmental Hygiene**

<b>Individual suggestions and personal comments</b>	<b>Percentage of endorsement as reported by medical practitioners for maintaining environmental hygiene N = 55</b>	
1. Regular medical check up of all industrial workers exposed to pollution is to be undertaken	-	50 (90.91%)
2. Services of specialist are to be utilised for dealing with pollution-caused diseases	-	42 (76.36%)
3. There is a need to educate the public on the hazards of industrial pollution	-	39 (70.90%)
4. Proper arrangements are to be made to dispose the harmful waste materials	-	23 (41.82%)
5. Proper health-safety methods are to be introduced in industrial organisations	-	15 (27.27%)
6. Heavy penalisation is to be imposed by the enforcement agencies in cases of violation of norms prescribed by the State Government	-	12 (21.82%)
7. The industrial concern polluting the environment should provide adequate compensation to the public affected by such pollutions	-	12 (21.82%)
8. Generally the management of the concern may not come forward to control pollution because of heavy investment in neutralising harmful effects of pollutants. In such cases the public should raise their voice to compel the government and the enforcement machinery to take necessary steps to protect the environment		8 (14.55%)

**7.3.4** Ninety per cent of medical practitioners suggest the regular medical check up of all industrial workers exposed to pollution. More than 76 per cent of the respondents suggest the services of specialists to deal with pollution-caused diseases. Nearly 71 per cent suggested the need to educate the public on the hazards of industrial pollution.

**7.3.5** Suggestions of veterinary surgeons for eliminating industrial pollution are presented in table 7.3.5.

**Table 7.3.5 (B)**

**Suggestions of Veterinary Surgeons for Eliminating Environmental Pollution**

Suggestions	Percentage of endorsement as reported by Veterinary Surgeons for eliminating pollution N = 4
1. Legislations for environmental hygiene	4 (100%)
2. Neutralising the pollution effects at the industrial unit level	4 (100%)
3. Grow more trees	3 (75%)
4. Availability of modern medical facilities	3 (50%)

7.3.6           The data given above show uniformity of opinion among veterinary surgeons. Legislations for environmental hygiene and neutralising the pollution effects at the industrial level have been suggested by veterinary surgeons of the area. The opinions expressed by veterinary surgeons are almost identical with the suggestions of medical practitioners.

7.4.0           Reactions to Industrial Pollution by Worker-Trade Union Leaders

7.4.1           The views of worker-trade union leaders of three selected major chemical units in the area have been collected with a purpose to find out their reactions to environmental pollution problems.

7.4.2           According to medical practitioners, industrial employees are the frequent patients who visit the local medical practitioners for treatment of diseases. This observation of medical practitioners showed that the industrial workers are the most affected parties of industrial pollution. If the worker trade union leaders are aware of the fact that industrial workers are the major category of people affected by industrial pollution, they should have been the first to involve themselves in the social movement against pollution. Data collected by the researcher on their reactions to the problems caused by industrial pollution and their

involvement in environmental protection groups are presented in this section of the thesis.

7.4.3 Data relating to their involvement in groups working for environmental protection reveal that all the 15 trade union leaders are not aware of the existence of organised groups working for environmental protection.

7.4.4 The general observation that worker trade union leaders do not take interest in environmental protection groups, in spite of the detrimental effects of pollution on health of workers, can be substantiated by the following reasons put forward by the trade union leaders themselves.

Table 7.4.4 (9)

Reasons for the Indifferent Attitude of Trade Union Leaders towards the Environmental Protection Groups

Reasons for not supporting environmental groups	Percentage of endorsement by trade union leaders for lack of support to environmental groups N = 15
1. Employment in industrial units	- 15 (100%)
2. There is no organised group	- 15 (100%)
3. Fear of losing the job	- 10 (66.66%)
4. No body is taking the initiative	- 9 (60%)

7.4.5 The above reasons by worker trade union leaders were derived by a content analysis of their statements on item 5.0 of the questionnaire.

7.4.6 Table 7.4.6 clearly indicates the helplessness of worker trade union leaders in supporting groups working for environmental protection. Absence of organised groups in the area could also be a reason for not taking any interest in the pollution problems.

7.4.7 Reactions of the worker trade union leaders on the response of management to the demands of environmental groups are presented under table 7.4.7.

Table 7.4.7 (10)

Reactions of Worker Trade Union Leaders on the Response of Management to the Demands of Environmental Groups

<u>Reactions of Worker Trade Union Leaders on the response of Management to the demand of environmental protection group</u>	<u>Percentage of endorsement by Trade Union leaders</u> N = 15
1. No organised group for the protection of environment except Eloor panchayat	- 15 (100%)
2. Management is more concerned about profits	- 13 (86.66%)
3. Construction of effluent treatment plants cost a lot of money	- 10 (66.66%)
4. Water Pollution Control Boards are not very strict	- 3 (20%)
5. No one is concerned, then why should they worry?	- 2 (13.33%)
6. I do not know!	- 1 (6.66%)

7.4.8 The above data clearly indicates lack of organized environmental groups according to worker trade union leaders to pressurise the management for proper pollution control of industrial units. Eighty<sup>six</sup>/per cent of the respondents are of the opinion that the management is more concerned about profits.

7.4.9 The reactions of worker trade union leaders on the response of management to the demands of environmental groups in table 7.4.7 is the result of content analysis of statement number 4.0 in the questionnaire.

7.4.10 The suggestion of worker trade union leaders for minimising the detrimental effects of pollution have been collected as a part of their reaction to industrial pollution. The main points are presented in table 7.4.10.

Table 7.4.10 (11)

Suggestions of Worker Trade Union Leaders for Eliminating Pollution

Suggestions	Percentage of endorsement as reported by trade union leaders for eliminating pollution. (N = 15)
1. Heavy compensation for pollution damage ..	14 (93.33%)
2. Neutralising pollution at the industrial unit level ..	13 (86.67%)
3. Industrial effluents should not be discharged into water bodies or air ..	13 (86.67%)
4. Recycling of effluents ..	10 (66.67%)
5. Periodic health check up of industrial employees ..	6 (40%)
6. Change of residence ..	3 (33.33%)
7. Legislations ..	2 (13.33%)

**7.4.11**            The professionals like medical practitioners and veterinary surgeons have recommended legislations whereas trade union leaders recommended heavy compensation for pollution damage. Only 13.33% of the worker trade union leaders consider legislations as a remedy for eliminating pollution.

**7.5.0**            Reaction to Industrial Pollution by the Managers of three Chemical Units in Eloor-Kalamassery Area

**7.5.1**            At the initial stage of investigation, questionnaires were distributed to the management of chemical units of the Eloor-Kalamassery area to elicit information on their awareness of industrial pollution and the influence of environmental protection pressure groups in changing management decisions. Lack of co-operation from the management of industrial units forced the researcher to exclude the formal official responses of the management and the researcher resorted to eliciting personal reactions of individual managers on issues of industrial pollution. The individual personal reactions of managers are not the official-formal response of the management of the industrial concerns.

**7.5.2**            The farmers of the Eloor-Kalamassery area who had put forward complaints to the management of industries responsible for pollution damage expressed the opinion that the managements were indifferent to the problems of industrial pollution. It was also observed that the industrial workers were the immediate victims of industrial pollution according



to the medical practitioners. But neither the workers nor their trade union representatives have come forward to protest against environmental pollution nor did these worker trade union leaders render their support to the environmental protection pressure groups. How do the individual managers react to these two observations, namely the indifference of management and trade union leaders to the problems of industrial pollution and the nature of functioning of environmental protection pressure groups in the area. Responses received from individual managers on the alleged indifference of management towards the problem of pollution are given in table 7.5.2.

**Table 7.5.2 (12)**

**Personal Reactions of Managers to the Alleged Indifference of Management to the Demands of Environmental Groups**

Allegations of Managers	Percentage of endorsement by Managers for the indifference of management to environmental issues N = 20
1. Groups do not exert strong pressure on the management ..	20 (100%)
2. Absence of strong environmental protection groups in the area ..	20 (92.33%)

7.5.3            Table 7.5.2 shows that individual managers are not aware of groups working for environmental protection in the area. Even if there are such groups, according to these

managers, such groups do not exert strong pressure on the management and this could be the reason for the indifference of management to industrial pollution problems in the area.

7.5.4 Personal reactions of individual managers on the role of worker trade union leaders in environmental protection are given in table 7.5.4.

Table 7.5.4 (13)

Views of Individual Managers on the Role of Trade Unions  
in not Supporting Environmental Causes

Views of individual managers	Percentage of endorsement by managers N = 20
1. Strong management and weak unions ..	15 (50%)
2. Fear of losing their jobs ..	15 (50%)
3. Unions are more interested in higher wages ..	14 (46.6%)

7.5.5 The individual managers are of the view that the worker trade union leaders do not come forward because the management is strong and the workers and trade unions are afraid of losing their jobs if they support the environmental protection groups. It is also quite interesting to note that the individual managers view the trade unions as an association more interested in higher wages and other personal benefits rather than as a social group concerned with larger issues affecting the community.

**7.5.6** Personal views of the managers on the ways and means to minimise or eliminate environmental pollution problems in the area are given in table 7.5.6.

Table 7.5.6 (14)

Recommendations of Individual Managers for Eliminating Pollution in the Elcor-Kalamassery Area

Recommendations	Percentage of endorsement by Managers N = 30
1. Regular inspection of industrial effluents by Water and Air Pollution Control Boards ..	26 (83.33%)
2. Regular medical check-up of industrial employees ..	25 (83.33%)
3. Neutralizing the pollution effect at the industrial unit level ..	23 (73.33%)
4. Strict legislations for environmental hygiene ..	10 (33.33%)

**7.5.7** Ninetythree per cent of the managers advocate regular inspection of industrial effluents by Air and Water Pollution Control Boards for ensuring that industrial units adhere to the norms stipulated by these boards. In addition 83 per cent of the managers recommend regular check-up of industrial employees. Only 73 per cent of the respondents have recommended neutralising the pollution effect at the industrial unit level by installing neutralising equipments and other devices. Only a minority of the respondents (33%) recommended strict legislations for better environmental hygiene.

**CHAPTER - VIII****8.0.0 STRUCTURE, STRATEGY AND ROLE OF ENVIRONMENTAL  
PROTECTION PRESSURE GROUPS IN KERALA****8.1.0 Introduction**

8.1.1 The present study is an attempt at discussing the structure, strategy and role of environmental protection pressure groups in Kerala especially those groups working against industrial pollution. As stated earlier, under Chapter VII, environmental protection pressure groups in Eloor-Kalamassery area were found limited to two groups viz. (1) the Eloor Panchayat, (2) the Periyar Bund Action Council and hence the scope of the study was widened to include all available environmental protection groups functioning in different parts of Kerala. For this purpose a list of such environmental protection groups functioning in Kerala was prepared. A seminar conducted on World Environment Day at the School of Environmental Studies, University of Cochin on June 5, 1982 provided a list of organisations engaged in creating environmental consciousness in Kerala. Another seminar conducted by the Chavara Cultural Centre on June 5, 1983 provided a list of organisations working for environmental protection. These two sources helped the researcher to prepare a comprehensive list on groups working in Kerala for environmental protection.

**8.1.2** Data obtained from these sources show that there are twentyfive associations/groups working in Kerala for environmental protection. Cochin, Calicut, Vellore, Trivandrum, Thekkady, Tellicherry, Quilon and Kothamangalam are the places where such groups were found very active. A list of such environmental protection groups in Kerala is given in Appendix-IV (a). A questionnaire was prepared for eliciting information on the structure, strategy and role of these environmental protection groups. Seventyfive questionnaires were distributed among the office bearers (President/Vice President/Secretary, etc.) of various environmental protection groups. Out of these seventyfive questionnaires, fifty questionnaires duly filled in were returned to the researcher.

**8.1.3** Data obtained regarding the background of the respondents - leaders of environmental protection groups working in various parts of Kerala - show that 28 per cent of the respondents are within the age group of 25 to 34 years; 52 per cent respondents within the age group of 35 to 44 years and 20 per cent of the respondents are in the age group of 45 years and above. All the leaders were males and occupied important positions in life, i.e., college teachers, lawyers, medical practitioners, scientists, technical experts and local leaders from the affected public. There was only one leader who was employed in an industrial concern as a senior manager. Majority of the leaders were post-graduates (66 per cent). Respondents having qualifications below S.S.L.C. level were found to be less than ten per cent.

8.1.4 In order to have a clear picture of the social background of the leaders of the environmental protection groups, especially their interests and involvements in various other organisations, specific questions relevant to these aspects were asked. Table 8.1.4 shows data pertaining to their involvement in other organisations.

Table 8.1.4 (1)

Involvement of Leaders of Environmental Protection Groups  
in other Socio-Cultural, Professional and Political  
Organisations

Membership in other organisations/ groups	-	Number and percentage of respondents (leaders of environmental protection groups) involved in other organisations N = 50
1. Environmental protection and professional organisations	-	10 (20%)
2. Environmental protection, professional and socio-cultural organisations	-	11 (22%)
3. Environmental protection and socio-cultural organisations	-	9 (18%)
4. Environmental protection groups alone	-	6 (12%)
5. Environmental protection, socio-cultural and political organisations	-	4 (8%)
6. Environmental protection and political organisations	-	2 (4%)
7. Environmental protection, professional, political and socio-cultural organisations	-	0 (0%)
8. Environmental protection, professional and political	-	0 (0%)

**8.1.5** Thirtysix per cent of the leaders of environmental protection groups have got membership in professional organisations. Twentytwo per cent of the respondents have got membership in professional and socio-cultural organisations. Eighteen per cent of the respondents are members of socio-cultural organisations, whereas only twelve per cent have got membership in environmental protection groups without membership in other organisations and groups. None of the leaders have membership in all organisations/groups and membership in political organisations is very few (4%).

**8.1.6** Attempts have been made on the basis of data collected from the leaders of environmental protection groups to study their awareness of industrial pollution and the problems created as a result of the presence of a large number of industries in the locality. The responses so obtained have been presented in table 8.1.6.

**Table 8.1.6 (2)**

**Negative Effects of Industrial Pollution as Perceived by the Environmental Protection Groups**

Negative effects of industrial pollution	Percentage of endorsement as reported by leaders of environmental groups (N = 50)	
1. Unhealthy environment which causes diseases to people, animals, plants, property and climate	-	50 (100%)
2. Destruction of vegetation	-	50 (100%)
3. Uninhabitable place	-	50 (100%)

8.1.7 The leaders of environmental groups are unanimous in their opinion that the presence of a large number of industries nearby causes environmental pollution problems to man, animals, plants, property and climate.

8.1.8 There is unanimous opinion among the respondents of environmental protection groups that there is a collective effort on the part of people to raise their voice against industrial pollution problems. Details of these groups in terms of name of the group, demands and methods used as reported by the leaders of environmental protection groups are presented in table 8.1.8.

Table 8.1.8 (3)

Environmental Protection Groups in Kerala: their Demands, Strategies and Tactics

<u>Name of the group</u>	<u>Demands</u>	<u>Strategies/ Tactics</u>
1. Periyar Bund Action Council - Eloor	a) Remove the bund across the Periyar river. b) Provide compensation for work lost due to construction of bund. c) Take immediate action against river pollution.	a) Public meetings, press statements. b) Submission of memorandum. c) Picketing, mass rally and dharna.
2. Eloor Panchayat - Eloor	The radio active lead sulphide waste buried in concrete containers in the factory premises of Indian Rare Earths factory should be removed to safer places.	a) Newspaper publications, public meetings. b) Submission of memorandum. c) Dharna and picketing.



Name of the group	Demands	Strategies/ tactics
3. Society for the Protection of Surroundings - Vellore	The Hindustan Paper Corporation should not discharge industrial effluents into the Moovattupuzha river.	a) Submission of memorandum to the Management. b) Press statements. c) Mass rallies. d) Public meetings
4. Panchayat Samithi - Vellore	Pollution caused by Hindustan Paper Corporation should be controlled.	a) Mass rally, drama and newspaper publications.
5. Friends of the Trees - Cochin	The government should save the Silent Valley rain forest.	a) Legal action. b) Press statements. c) Newspaper publications. d) Pamphlets.
6. Save Silent Valley - Cochin	The government authorities should protect Silent Valley area from destruction.	a) Utilising the mass media for arousing public awareness. b) Legal action.
7. Organisation for Protection from Nuclear Radiation Kothamangalam	The decision of the government to set up a nuclear plant km. from Boothathankettu in the area should be abandoned.	a) Publicity. b) Press statements.
8. Kerala Sastra Sahitya Parishad - Trivandrum	Government authorities, Corporations and management by of industrial units particularly in Calicut and Trivandrum should control air and water pollution.	a) Mass education of the public through public meetings special articles, news releases, radio pamphlets and newspapers. b) Action programmes. c) Legal proceedings.

Name of the group	Demands	Strategies/ tactics
9. Cochin Science Association, working group on environmental protection - Cochin	The Corporation should eradicate pollution in Cochin city.	a) Public meetings. b) Press statements. c) Legal remedies.
10. Society for the Protection of Environment Kerala - Calicut	a) The Gwalior Rayons Management should treat the effluents before discharging into water bodies.	a) Public meetings. b) Newspaper publications. c) Action programmes.
11. Committee for the Advancement of Legal Literature - Calicut	The Gwalior Rayons management should take effective steps to prevent air and water pollutions.	A case was filed against the management of the Gwalior Rayons factory.
12. Environmental Protection Co-ordination Committee - Calicut	The management of Gwalior Rayons factory should take effective steps to prevent water pollution.	Study camps to educate the people on the ill effects of pollution.
13. Parisara Samrakshana Ekopana Saniti - Calicut	The Management of Gwalior Rayons factory should control pollution of Chaliyar river and provide compensation for loss.	Sharna Picketting

8.1.9 Data presented in table 8.1.8 show that there are 13 environmental protection pressure groups in Kerala. These thirteen groups have specific demands directed towards the management or government authorities assumed to be

responsible for pollution and/or environmental deterioration. Ten of these environmental protection pressure groups demanded better environmental conditions free from industrial pollution. The remaining three environmental protection pressure groups directed their efforts towards pressurising the government in changing its decision of constructing an hydro-electric project in the Silent Valley area and also its decision to set up a nuclear plant near Kothamangalam, one kilometre away from Bhoothathankettu.

8.1.10 Such environmental protection groups (12 in number) which did not find a specific agency responsible for environmental deterioration or industrial pollution often confined their action programmes to long term strategies such as mass education, research studies and other forms of public education and publications. Environmental protection pressure groups, on the other hand, frequently resorted to short term tactics and action programmes such as satyagraha, dharna, protest march and submission of memoranda to concerned authorities. The 113 such groups which could perceive specific agencies responsible for environmental problems acted as pressure groups to change the decision of the concerned authorities. However, the success of such pressure groups depended on the support they could get from the relevant public in the area, such as industrial workers, local farmers and residents. How did the local people affected by industrial pollution perceive the role of such environmental protection

groups in influencing the authorities for better environmental conditions is described in detail in paragraph 8.2.0.

**8.2.0 Reaction of Various Relevant Segments of the Public in the Eloor-Kalamassery Area to Groups Working for Environmental Protection**

**8.2.1 Awareness of environmental protection groups and their role in influencing the authorities for a better environmental condition, as perceived by the local farmers, medical practitioners and other relevant segments of the public in the Eloor-Kalamassery area was explored and data obtained on this aspect are presented in table 8.2.1.**

**8.2.2 Analysis of the data shows that the medical practitioners and the veterinary surgeons of the area are not aware of any group working for environmental protection. According to them the absence of organised environmental groups was one of the reasons for the discharge of effluents into air and water bodies. Other questions pertaining to details of such groups working for environmental protection have been eliminated due to the absence of such groups in the area.**

**8.2.3 According to ten per cent of the farmers of the Eloor-Kalamassery area, the only group working for environmental protection was the Eloor Panchayat. Majority of the farmers were unaware of any group working for environmental protection.**

**Table 8.2a1 (4)**

**Perception of Various Relevant Segments of the Public  
on the Existence and Role of Organised Environmental  
Protection Groups in the Elcor-Kalansassery Area**

Various relevant segments	Total number of respondents	Percentage of endorsement		Remarks
		Not aware of such groups	Aware of such groups	
Medical practitioners	55	55 (100%)	0 (0%)	Absence of organised groups in the locality was the reason for the discharge of effluents into air and water bodies.
Veterinary surgeons	4	4 (100%)	0 (0%)	Absence of groups in the locality was the reason for the discharge of pollutants into air and water bodies.
Farmers	60	54 (90%)	6 (10%)	The management has remained indifferent to pollution problems due to the absence of such environmental protection groups.
Worker trade union leaders	15	15 (100%)	0 (0%)	Absence of groups makes the management indifferent to environmental pollution problems
Managers	30	30 (100%)	0 (0%)	Inspite of heavy industrial pollution no one has come forward.

**8.2.4** There is an unanimous opinion among the worker trade union leaders that the absence of environmental protection groups working in the area is the reason for the indifferent attitude of the management to pollution problems in the area.

**8.2.5** Data obtained from the individual managers of three major chemical units, indicate that in spite of industrial pollution problems in the area no environmental protection group has come forward to protest against such problems of environmental hazards.

**8.2.6** In the light of the above findings it could be inferred that the various relevant segments of the public in the Eloor-Kalamassery area are not aware of the existence of organised groups working for environmental protection, inspite of heavy industrial pollution in the area.

**8.3.0** Structural Characteristics of Environmental Protection Groups in Kerala

**8.3.1** Background information of groups working for environmental protection - its size, member composition, year of establishment, office bearers, objectives, functions and achievements - are presented in tables 8.3.1 (a), 8.3.1 (b) and 8.3.1 (c).

Table B.3.1 (a) (3)

**Background Information of Environmental Protection  
Groups in Kerala**

Name of the group	Head- Quar- ters	Year of esta- blish- ment	Members	ship	Criteria for mem- bership	Name of the office bearer	
						President	Secretary
1. Cochin Science Association	Cochin	1967	125		Any one	P. V. S. Nambo- othiripad	U. K. Gopalan
2. Friends of the Trees	"	1978	30		"	U. K. Gopalan	K. K. George
3. Save Silent Valley	"	1978	40		"	R. K. Ramesh	M. K. N. Petty
4. World Wild Life Fund	"	1981	80		"	C. T. Samuel	U. K. Gopalan
5. Cochin Envi- ronmental Protection Agency	"	1981	40		"	K. P. Sala- krishnan	K. V. Devasia
6. Malabar Flora & Fauna Society	"	1983	100		"	B. S. Bagia	Vijayakumar
7. Society for Ecological Conservation and Develop- ment	"	1983	50		"	K. P. Sala- krishnan	K. V. Devasia
8. Public Interest Law Service Society	"	1983	50		"	S. Eswara Iyer	Vincent Pani- kulangara
9. Eloor Panchayat	Eloor	1981	25		"	K. P. Raghavan	K. K. Sridhar
10. Periyar Bund Action Council	Eloor	1982	12		"	Mathew Thotta- kath	Augustin Panachikal

Name of the group	Head-quarters	Year of establishment	Total membership	Criteria of membership	Name of the office bearer	
					President	Secretary
11. Organisation for Protection from Nuclear Radiation	Kothamangalam	1982	15	Any one	N.P.Varghese	
12. Thekkady Wild Life Society	Thekkady	1982	50	"	P.A.Joseph	
13. Oailon Environmental group	Oailon	1978	53	"	S.Feizi	
14. High Range Wild Life Preservation Association	High Range	1978	52	"	Samar Singh	
15. Society for Environmental Education in Kerala	Tellicherry	1972	350	"	John C.Jacob	
16. Society for the Protection of Surroundings	Vellore	1982	15	"	V.M.Maryyasan Nair	
17. Panchayat Samithi	Vellore	1982	25	"	V.M.Maryyasan Nair	
18. Centre for Development Studies *	Trivandrum	1971	90	"	P.G.K.Panikkar	K.N.Nair
19. Prakriti Samrakshana Samithi	Trivandrum	1980	155	"	N.V.Krishna	B.Sugathakumari
20. Kerala Sasthra Sahitya Parishad	Trivandrum	1962	7000	"	K.K.Krishnakumar	
21. Mitranikethan	Trivandrum	1967	32	Any one	K.Vishwanathan	

\* Directory of Environment, Department of Environment, New Delhi, 1985



Name of the group	Need- quarters	Year of establish- ment	Total mem- bership	Criteria of mem- bership	Name of the office bearer	
					President	Secretary
22. Society for Protection of Environ- ment Kerala	Call- out	1979	9	Any one	A. Ashutan	K. M. Unnikrish- nan
23. Parisara Sarakshana Ekopana Samithi	"	1982	28	"	V. K. Dama- daran	K. M. Unni- krishnan
24. Environ- mental Pre- tection Co- ordination Committee	"	1982	22	"	A. K. Lohitha- khan	
25. Committee for the Advance- ment of legal liter- ature	"	1982	21	"	S. K. Pottakkatt	Theruvath Kanan

**\*Criteria for membership**

1. People who are above 18 years of age and who have got interest in science.
2. People who are willing to remit Rs.1/- as admission fee and pay Rs.5/- per annum as membership fees.
3. People who are eligible as members and who remit Rs.100/- in advance are accepted as life members.

**Table 6.3.1 (b) (c)****Objectives and Functions of Environmental Protection Groups**

Objectives of environmental protection groups	Functions of environmental protection groups	Number and percentage of environmental groups which endorsed the stated objectives and functions	
		N = 12	N = 12
1. To popularise ideas on ecology and environment	Education and publication	12 (100%)	12 (100%)
2. To arouse environmental concern through mass education programmes	Public awareness through the use of mass media	12 (100%)	12 (100%)
3. To advocate conservation of wild animals, birds, trees and plants	Publication of literature (for enforcing a decision or protesting against a decision)	5 (38.46%)	11 (91.67%)
4. To organise special conferences, workshops, seminars and publish relevant material on environment	Education + Conferences, workshops, seminars and publication	7 (58.33%)	10 (83.33%)
5. To conduct research on environmental problems	Research studies	10 (76.92%)	7 (58.33%)
6. To assist other groups/ organisations with similar interest	Education and training	6 (46.15%)	5 (41.67%)
7. To render scientific aid	Aid through expert scientific knowledge	9 (69.23%)	4 (33.33%)
8. To provide free legal aid to the public concerning environmental problems	Expert knowledge on legal aspects	2 (15.38%)	1 (8.33%)
9. To encourage research projects	Research studies	10 (76.92%)	1 (8.33%)

Table 8.3.1 (a) (7)

Achievements of Environmental Protection Groups

Achievements	Number and percentage of environmental protection groups which endorsed the stated achievements		Total
	N = 13	N=12	
1. Studied environmental pollution problems in industrial areas	10 (76.92%)	0 (0%)	10
2. Organised social action programmes (dharna/satyagraha/protest march, etc.	13 (100%)	0 (0%)	13
3. Made use of mass media to highlight the problems of environmental pollution	13 (100%)	0 (0%)	13
4. Organised seminars, conferences and published relevant literature on environment	7 (53.85%)	10(83.33%)	17
5. Environmental education classes have been undertaken in schools, colleges, universities and rural areas	6 (46.15%)	7(58.33%)	13
6. Organised mass education of the public by using audio-visual aids	13 (100%)	4(33.33%)	17
7. Helped in the preservation of wild life including plants and animals	5 (38.46%)	11(91.67%)	16
8. Rendered scientific aid	9 (69.23%)	4(33.33%)	13
9. Encouraged research projects	8 (61.54%)	1(8.33%)	9
10. Provided free legal aid	2 (15.38%)	0(0%)	2

**8.3.2** Data presented in table 8.3.1(a) shows that the maximum concentration of environmental protection groups in Kerala is found to be located in Cochin (8), followed by Calicut (4), Trivandrum (4), Eloor (2), Kothamangalam (1), Thekkady (1), Quilon (1), High Ranges (1) and Tellicherry (1). The oldest environmental protection group in Kerala established in the year 1962, is the Kerala Sastra Sahitya Parishad. Cochin Science Association and Mitraniketan were established in 1967. All other groups and associations were formed in 1970s and 1980s. Regarding the membership the Kerala Sastra Sahitya Parishad has 7,000 members, the Society for Environmental Education in Kerala has 350 members, the Malabar Flora and Fauna Society has 100 members and all the rest have less than hundred members on roll. The Society for Protection of Environment Kerala has only nine members. There are no restrictions pertaining to the enrollment of members in these environmental groups. Anyone having interest in environmental protection and conservation could enroll as members of such groups after paying the required membership fees. Kerala Sastra Sahitya Parishad is an exception.

**8.3.3** Data presented in table 8.3.1(b) show two categories of environmental protection groups, i.e., groups with certain action programmes directed towards certain specific agency assumed to be responsible for pollution problems and groups working for environmental conservation as such without any action programmes directed towards specific agencies

assumed to be responsible for environmental deterioration. A comparison of these two environmental protection groups shows certain differentiating features. The thirteen groups acting as pressure groups were much concerned with action programmes such as dharna, protest march, etc. against agencies assumed to be responsible for environmental pollution. In addition to such social action programmes, providing expert knowledge to the public on legal aspects and creating public awareness through the publication of scientific literature prepared by experts in the field and arousing the public through the mass media are the major strategies/tactics adopted by these pressure groups. Groups working for environmental protection/conservation (12 groups) focussed their attention on education and training, organising conferences, workshops, seminars and publications. These are long term strategies adopted by these groups without specific targets for direct attack.

8.3.4 Data presented in table 8.3.1(e) show that the achievements of the two groups differ with respect to the set objectives. Environmental protection pressure groups have organised social action programmes, used mass media and educated the public by the use of audio-visual aids. Groups for environmental protection/conservation have helped in the preservation of wild life and organised seminars, conferences and published relevant literature concerning the environment.

#### **8.4.0 Strategies and Tactics Used by Environmental Protection Groups in Kerala**

**8.4.1** At the conceptual level, the term strategy refers to the plan of action adopted by an organisation, group or individual for the attainment of their/his specific objectives within a long range time frame. On the other hand, the term tactics refers to a short term and/or an immediate course of action resorted to by an organisation or individual for the achievement of short term or immediate goals or to overcome an unexpected problem as a consequence of counter strategies or tactics adopted by the opposing party.

**8.4.2** The environmental protection pressure groups and other environmental protection/conservation groups were asked to specify the strategies and tactics they had adopted to achieve their set objectives. Table 8.4.2 shows the strategies and tactics used by environmental protection groups in Kerala for achieving their objectives.

**8.4.3** Table 8.4.2 provides data on the strategies and tactics used by environmental protection pressure groups and environmental protection/conservation groups. The former groups frequently utilised tactics or short term action programmes while the latter groups were not interested in such short term social action programmes. The environmental protection/conservation groups confined their activities to the organisation of seminars, conferences and publications. The

Table 8.4.2 (8)Strategies and Tactics Used by Environmental Protection Groups in Kerala

Strategies and Tactics	Number and percentage of environmental protection groups which endorsed the stated strategies and tactics	
	N = 13	N = 12
<u>Strategies</u>		
1. Research projects and publications	- 13 (100%)	9 (75%)
2. Environmental education and training	- 7 (53.85%)	8 (66.67%)
3. Influencing the political parties and government authorities for the enactment of environmental legislations	- 8 (61.54%)	4 (33.33%)
<u>Tactics/short term action programmes</u>		
1. Submission of memorandum	- 13 (100%)	0 (0%)
2. Newspaper publications	- 13 (100%)	0 (0%)
3. Protest march	- 10 (76.92%)	0 (0%)
4. Dharna	- 8 (61.54%)	0 (0%)
5. Legal procedures	- 4 (30.76%)	0 (0%)

strategies used by these groups are confined to environmental education, training and publications. The environmental protection pressure groups also utilized long term strategies to achieve their objectives by conducting research and publications on environmental problems and also by influencing the political parties and government authorities for the enactment of environmental legislations. In fact the environmental

protection pressure groups were more active both in short term action programmes and in long term strategies for achieving their set objectives than the environmental protection/conservation groups.

**8.4.4** Data pertaining to environmental litigation which was one of the tactics used by environmental protection pressure groups reveal that only 30 per cent of the respondents (groups) approached the court with complaints against specific agencies responsible for environmental deterioration. According to these respondents, 50 per cent of the cases referred to the court for verdict was in favour of the management of industrial units. Only 25 per cent of the cases were in favour of the group. Court verdicts are not yet available in the remaining cases.

#### **8.5.0 Role of Environmental Protection Pressure Groups**

**8.5.1** The environmental protection pressure groups in Kerala have played the role of educators by their publications, training programmes and the use of mass media to create awareness among the general public on various environmental issues and problems. In fact, these groups have organised mass education of the public especially on the ill effects of industrial pollution. Worth mentioning is the role played by Kerala Sastha Sahitya Parishad. The Kerala Sastha Sahitya Parishad organised mass education classes in various parts of Kerala to



highlight problems of environmental deterioration. In spite of all their weaknesses, the environmental protection pressure groups could make environmental care a live issue even today.

**8.5.3** The differentiating feature of environmental protection pressure groups from environmental protection/conservation groups lies in action programmes envisaged by the former for achieving their set objectives. As a means of achieving immediate objectives, the environmental protection pressure groups resorted to tactics which are often envisaged by academic groups. The environmental protection pressure groups in Kerala used short term tactics such as dharna, satyagraha and protect march which were not resorted to by environmental protection / conservation groups. In this way, the environmental protection pressure groups in Kerala exhibited the role of an agitator.

**8.5.3** A number of research studies on environmental problems have been conducted by the environmental protection pressure groups. Data presented in table 8.3.1(c) substantiate the achievements of environmental protection pressure groups in this field. Action-oriented research programmes pertaining to environmental pollution were undertaken by the Kerala Sastra Sahitya Parishad. Some of such important studies are the 'socio-economic and ecological consequences of water control projects', 'Pollution of Chaliyar river by the Qualier Rayons factory' and the 'Silent Valley' case (K.S.S.P., 1981,

p.21). Thus environmental protection pressure groups were taking the role of a researcher.

**8.5.4** Environmental protection pressure groups have in fact provided scientific knowledge to the public concerning environmental problems. Free legal aid on matters connected with the environment were rendered to the public through professionals in the field. Thus environmental protection pressure groups were playing the role of an expert adviser by providing knowledge on environmental problems to the public and the concerned parties.

**8.5.5** How far the environmental protection pressure groups have succeeded in influencing the general public to pay more attention to environmental issues? These groups could succeed in creating an awareness among the general public through their publications, training programmes and research studies. To the extent of creating an awareness among the public these groups have contributed their share as a reformer. Again Kerala Sastha Sahitya Parishat has contributed to the environmental movement in Kerala by their publications and campaigns. A science campaign conducted by the Kerala Sastha Sahitya Parishat in 1971 helped the members of the Parishat to speak on chosen science topics to the common man. In 1973 various classes delivered by experts were conducted and more than one and a half lakh people benefitted by these classes. In October 1977 the Parishat organised a 'jeep jatha' which travelled from northern most part of Kerala to the southern most part and

spoke to more than five lakhs people, The Kerala Sastra Sahitya Parishad as an environmental protection pressure group has scored some significant successes as a reformer. However, all other environmental protection pressure groups in Kerala are yet to prove their role as a reformer.

8.5.6 Majority of the environmental protection pressure groups have failed in their role as a representative of the groups affected by environmental pollution problems. Farmers and industrial employees are the affected groups in the Eloor-Kalamassery area. Analysis of data collected from these groups reveals that majority of them were unaware of groups working for environmental protection. In spite of the fact that Eloor-Kalamassery area is the industrial belt of Kerala with a high concentration of industrial pollution, the environmental protection pressure groups in the area could not influence the affected parties in the locality.

8.5.7 Most of the environmental protection pressure groups though involved in environmental education, research and publications, did not adopt a long term strategy with appropriate action programmes for the development of conditions conducive for a better environment. These long term strategies could be the enactment of suitable environmental legislations to control the discharge of harmful pollutants from industrial units. Involving political parties with environmental issues could also be a long term strategy of these groups, for political parties are the major force that

could influence the government. Data obtained on the strategies and tactics of the environmental protection pressure groups show their weakness in their role as a planner for a future environment.

8.5.6 There are twentyfive independent environmental protection pressure groups working in various parts of Kerala for environmental protection, conservation and education. In spite of these independent groups having similar interests and objectives, they did not act as a co-ordinated single unit on specific environmental issues. This state of affairs indicate absence of a higher level apex body for co-ordinating and integrating individual groups. Forty per cent of environmental protection groups have expressed their interest in assisting other groups with similar interests. There was no evidence of such support or collaborative efforts with other similar groups. Most of the groups worked as anomic groups reacting to an immediate issue without a long range perspective or as a social association of professionals in the name of environmental conservation and protection. The only exception to these groups is the Kerala Sastra Sahitya Parishad which has constituent units in various parts of Kerala. Activities of these groups could be co-ordinated and integrated by the Kerala Sastra Sahitya Parishad. The success of this group, to some extent, could be attributed to the nature of their organisational structure.

### 8.6.0 Effectiveness of Environmental Protection Groups

8.6.1 Could these environmental protection pressure groups draw the attention of the management to environmental issues or influence them to act positively to their demand for a better environment? Table 8.6.1 shows that 51.54 per cent of the groups felt that the management was indifferent, 38 per cent felt that the management ignored their demands while none of them reported a sympathetic attitude from the management of the industrial units.

Table 8.6.1 (9)

#### Perception of Environmental Protection Pressure Groups on the Reaction of Management to their Demands

Reactions of the management	Number and percentage of environmental protection pressure groups which endorsed the stated reactions of management N = 13	
1. Indifferent	-	8 (61.54%)
2. Ignored	-	3 (38.46%)
3. Sympathetic	-	0 (0%)

8.6.2 Reactions of government authorities such as Air and Water Pollution Control Boards to the demands of environmental protection pressure groups as perceived by the group leaders are presented in table 8.6.2. The data indicate that the environmental protection pressure groups could not influence these authorities, for the group leaders felt that the

government and high level authorities usually supported the management. Thirty eight per cent of the respondents felt that the high level authorities were indifferent to the demands of the group. In the light of the above findings one could infer that the groups could not influence the government authorities i.e., their role as a pressure group to change the decision of the management through the intervention of agencies of the government such as Air and Water Pollution Control Board was ineffective in bringing about the desired change.

**Table 8.6.2 (10)**

**Perception of Environmental Protection Pressure Groups on  
the Reactions of Government Authorities to their  
Demands**

Reactions of government authorities	Number and percentage of environmental protection pressure groups which endorsed the stated reactions of government authorities N = 13
1. Supported the management -	6 (61.54%)
2. Indifferent to the demands of the group -	5 (38.46%)
3. Sympathetic to the demands of environmental groups -	0 (0%)

**8.6.3** Did the management respond positively to the pressure tactics of these groups or were they indifferent? Table 8.6.3 shows that 46 per cent of the respondents were of the opinion that the concerned management reacted to the demands of pressure groups negatively through publications of

their stand in newspapers, 23 per cent of the respondents felt that the management was indifferent to all the tactics of the pressure groups. A minority of the respondents (15%) felt that the management was aggressive. Some of the respondents (15%) felt that the management even tried to buy prominent leaders of environmental protection pressure groups by promises of employment and other offers.

Table 8.6.1 (11)

Counter Movements of Management as Perceived by Environmental Protection Pressure Groups

Counter movements of management	Number and percentage of environmental protection pressure groups which endorsed the stated counter movements of management N = 13
1. Newspaper publications -	6 (46.15%)
2. Indifferent -	3 (23.08%)
3. Aggressive action against the group -	2 (15.38%)
4. Trying to buy the prominent leaders by promises of employment -	2 (15.38%)

8.6.4            The reactions of socio-cultural groups as perceived by the leaders of environmental protection pressure groups are presented in table 8.6.4. <sup>The</sup> Data reveal that the highest support to these groups came from the professional groups (76%). Sixtyone per cent of the respondents felt that the socio-cultural groups in the locality supported the

environmental group. It is quite interesting to note that political parties completely refrained from any kind of involvement in groups working for environmental protection. Eighty-four per cent of the respondents felt that political parties were indifferent or showed no involvement in environmental issues. In a state highly saturated with political activities and involvement of political parties with each and every social activities, it is surprising that political parties did not take any interest on issues of environmental conservation and protection. It is equally interesting to observe that environmental protection groups did provide opportunities for the political parties to involve themselves in the social and educational movement for a better environment.

Table 8.6.4 (12)

Degree of Involvement of Socio-Cultural, Professional and Political Organisations to the Demands and Protests of Environmental Protection Pressure Groups

Degree of involvement	Number and percentage of environmental protection pressure groups which endorsed the stated degree of involvement from		
	Socio-cultural	Professional	Political
Supporting	- 8 (61.54%)	10 (76.92%)	2 (15.38%)
Indifferent	- 7 (53.84%)	2 (23.07%)	11 (84.61%)

**8.6.5** How do the leaders of these environmental protection pressure groups perceive the effectiveness of their programmes? Do they feel quite successful in their programmes?



Table 8.6.5 reveals that 76 per cent of the respondents were quite satisfied with their programmes. However, the general feeling of the leaders of the groups that they were quite successful has not been supported by available data. In fact they could not influence the government authorities nor the management of industrial units. More than 80 per cent of the court cases were in favour of the management, but, still they feel quite successful in their programmes for maintaining a better environment free from industrial pollution.

Table 8.6.5 (13)

Degree of Success/Failure of Environmental Protection  
Pressure Groups in Kerala

Degree of success/ failure	Number and percentage of environmental protection pressure groups which under- sed the stated degree of success or failure N = 13
Completely successful -	10 (76.92%)
Partially successful -	2 (15.38%)
Total failure -	1 (7.69%)

8.6.6 The future courses of action suggested by the respondents of 25 groups is presented in table 8.6.6. The data reveal that their future emphasis is on environmental education of the public and on certain action programmes for the achievement of objectives. In fact some of the groups have mentioned the need for directing their effort towards the

government, identifying the agencies responsible for environmental pollution, enlisting the support of students and local people, organising panchayat level committees and establishing co-ordination of all groups working for environmental protection. These suggestions were given only by a minority of such groups. The Environmental Brigade of the Kerala Sastra Sahitya Parishad could do a lot in this field.

Table 8.6.6 (14)

Future Plans of the Group Devoted to Environmental Protection

Future courses of action	Number and percentage of environmental protection groups which endorsed the following courses of action for the future	
	N = 25	
1. Environmental education of the public -	6	(24%)
2. Action programmes till demands are met -	5	(20%)
3. Resorting to direct action if the government remain indifferent -	4	(16%)
4. Action research -	2	(8%)
5. Locating the sources of pollution in industries -	2	(8%)
6. Enlisting the support of students at all levels -	2	(8%)
7. Local level mobilisation -	1	(4%)
8. To take up all problems of environmental pollution -	1	(4%)
9. Constituting Panchayat ward level committees and councils to strengthen their activities -	1	(4%)
10. Co-ordinating all groups, with similar interests -	1	(4%)

**8.7.0 Structure, Strategies and Role of Environmental Protection Pressure Groups Within a Theoretical Framework**

**8.7.1** Analysis of the structure, strategies role and dynamics of environmental pressure groups in the light of a theoretical framework may show the factors essential for the success of environmental protection pressure groups in achieving their set objectives.

**8.7.2** G.A. Almond and G.B. Powell have classified pressure groups into four categories, i.e., institutional, associational, non-associational and anomie pressure groups (Almond, G.A. and G.B. Powell, 1966, pp.75-78). This classification is on the basis of structural characteristics that are associated with different kinds of pressure groups.

**8.7.3 Institutional pressure groups:** are formal organisations. The defining criterion of a formal organisation is "the existence of procedures for mobilising and co-ordinating the efforts of various, usually specialised, subgroups in the pursuit of joint objectives" (Blau Peter, 1969, p.61).

Organisations generally have an administrative machinery, a specialised administrative staff responsible for maintaining the organisation as a going concern and for coordinating the activities of its members. The term bureaucracy is used in sociology neutrally to refer to these administrative aspects of organisations. "But wide variations among organizations exist

in the degree of bureaucratization as indicated by the amount of effort devoted to administrative problems, the proportion of administrative personnel, the hierarchical character of the organization or the strict enforcement of administrative procedures and rigid compliance with them" (Blau Peter, 1969, p.62). The German sociologist Max Weber in his theory of bureaucracy, outlined the distinctive characteristics of such a formal organization as follows:

- Organizational tasks are distributed among the various positions as official duties. There is a clear-cut division of labour among positions which makes possible a high degree of specialization.
- The positions or offices are organized into a hierarchical authority structure. In the usual case this hierarchy takes on the shape of a pyramid wherein each official is responsible for his subordinates' decisions and actions as well as his own, to the superior above him in the pyramid and wherein each official has authority over the officials under him.
- A formally established system of rules and regulations governs official decisions and actions. The regulations provide for continuity in operations regardless of changes of personnel, thus promoting a stability lacking in many other types of groups and collectivities such as social movements.
- There is specialized administrative staff whose task is to maintain the organization and, in particular, the lines of communication.
- Officials are expected to assume an impersonal orientation in their contacts with clients and with other officials.

- Employment by the organisation constitutes a career for officials, officials are appointed to positions, not elected and thus are dependent on superiors in the organisation rather than on a body of constituents. Remuneration is in the form of a salary, and pensions are provided after retirement.

8.7.4 Weber held that the above mentioned features of an administrative organisation and especially, their combinations are "capable of attaining the highest degree of efficiency" (Blau Peter <sup>b2</sup> Max Weber, 1946, pp.196-204 and 217).

8.7.5 Associational pressure groups are voluntary associations or unions formed to promote and protect their interests by collective action. They are "the specialised structures for interest articulation" (Almond, G.A. and G.B. Powell, 1966, p.48). Their particular characteristics are explicit representation of the interests of a particular group, a full time professional staff and orderly procedures for the formulation of interests and demands (Almond, G.A. and G.B. Powell, 1966 p.78). "Their organisational base gives them an advantage over non-associational groups; their tactics and goals are often recognised as legitimate in the society and by representing a broad range of groups and interests they may limit the influence of potential institutional groups" (Almond, G.A. and G.B. Powell, 1966, p.79). Associational groups in India are of two types i.e., occupational and community (Brecher, Michael, 1966, p.160). The occupational groups spring from the modern centres of society, such as industry and the universities. The community

groups, on the other hand, are based on traditional social structures associated with religion, caste or language (Hanson, A.H. and Janet Douglas, 1972, p.88). The most important associational pressure groups in Indian politics are trade unions, business associations, government employees' associations and student organisations (Fadia Babulal, 1980, p.49). Trade unions began to develop in India towards the end of the First World War. The situation created in India during the war made it necessary for workers to organise themselves. In the initial stage, many leaders of the Indian National Congress were prominently associated with trade unions and the trade union movement (Karnik, V.B., 1966, p.29). The national movement gave the workers courage to ventilate their grievances and showed them the path to organise themselves on trade union lines in order to secure their redress. The trade union movement has acquired a certain status in the public life of the country. In the Indian labour conferences and in all tripartite bodies it has a status equal to that of employers' organisations. It is consulted by the Central and State Governments on all matters affecting the interests of workers. They have their spokesmen in Parliament and in State Legislatures (Fadia Babulal, 1980, p.53).

#### 8.7.6 Institutional vs. Associational Pressure Groups:

Institutional pressure groups are characterized by a high degree of specialized administrative staff with a hierarchical authority structure. Associational pressure groups consist of little

division of labour with a limited number of roles assigned to the members of the group; the roles being limited to president, secretary, vice president and treasurer.

- Institutional pressure groups represent the interests of varied groups in society, while associational groups represent the interests of a particular group.
- Rules and regulations laid down by institutional pressure groups provide for a continuity of function and the group as such remains stable in spite of changes of personnel. Associational groups, on the other hand, may undergo drastic changes with the replacement of personnel, sometimes the group as such might fade away after a certain period.
- Institutional pressure groups are expected to maintain a high degree of impersonal relationships among the officials of the group and the clients with whom the group interacts. Associational pressure groups are voluntary organizations formed to represent the interest of a particular group and hence ensures personal relationships between office-bearers and members.
- In the case of institutional pressure groups, officials are appointed to respective positions while office bearers are elected by the members of the associational pressure groups.
- Employment, salary and pension after retirement constitute a career for officials who belong to institutional pressure groups. Office bearers of the associational pressure groups are elected by the members of the group to represent the interests of that particular group. Remuneration to officials of associational groups is in the form of prominent positions in the group rather than salary and pension.

8.7.7 The distinguishing characteristic feature of the non-associational pressure groups is that the structure of interest articulation is latent and often informal. Communal and religious groups belong to this category. The term 'Communal' is used for a social group community that seeks to promote the interests of a section of the population. Communal organizations represent narrow ethnic and religious units and endeavour to get better facilities for their respective communities. The All India Conference of Indian Christians, the Parsi Central Association and the Anglo-Indian Association are organizations devoted to the interests of special religious groups. Caste groups like the Marwari Association are dedicated to the interests of a community, which has achieved a conspicuous place in the business life of India (Padia Babulal, 1980, p.66). The Harijan Sevak Sangh is one of the many associations which works for the social and economic status of the lower castes through legislations and social work. Individuals and groups representing Gandhian ideology also belong to the types of non-associational pressure groups. These groups are composed of persons who were associated with Mahatma Gandhi or his thoughts and try to project the policies and views of the father of the nation. "It was to a large extent due to the influence of these Gandhites that the Government yielded to the demand for restricting the production of cotton textiles and encouraged co-operative handicraft production. The passing of the Khadi and Handloom Industries Development Bill in 1983 by the



Parliament was one of the achievements of the Gandhian pressure groups" (Fadia Babulal, 1980; p.66).

**8.7.8 Non-Associational pressure groups vs. other forms of pressure groups:** Non-associational pressure groups differ from institutional and associational pressure groups with respect to the traditional groups they are composed of. Important non-associational groups include the following: communal and religious groups, caste groups, Gandhian groups, language groups, the ideological left, young turks, etc.

- Institutional pressure groups may articulate their own interests or represent the interests of other groups in the society. Associational pressure groups represent the interests of a particular group, while non-associational pressure groups represent the interests of a section of the population.
- Clear-cut division of labour among positions allowing a high degree of specialisation that is observed in the case of institutional pressure groups and a limited number of roles assigned to the members of associational groups are absent in the case of non-associational pressure groups. One person assumes the leadership role and others follow him. e.g. In Patna half a million people marched in procession under the leadership of Jaiprakash Narayan to present the Governor with two million signatures in support of the demand for the dissolution of the Bihar Legislative Assembly (Fadia Babulal, 1980, p.66).
- Institutional pressure groups remain unchanged in spite of changes of personnel. Unlike the associational pressure groups, the non-associational pressure groups undergo changes with the replacement of personnel.

- Non-associational pressure groups differ from institutional pressure groups with respect to the appointment of officials in the case of the latter and they are similar to associational groups with respect to the election of office-bearers.
- Tactics and goals of associational pressure groups are considered as legitimate in society, while institutional pressure groups do not resort to any form of tactics since rules and regulations are well-defined. Non-associational pressure groups engage in tactics that are often exhibited by anomic pressure groups.

8.7.9 Anomic pressure groups are more or less spontaneous groups that break through into the political system from the society, such as riots, demonstrations, assassinations and the like (Almond, G.A. and G.B. Powell, 1966, pp.73-76).

"The break up of that traditional way of life, and the consequent sense of uprootedness and disorientation, is the source of what sociologists call anomic" (Bell Daniel, 1974, p.287). It was Emile Durkheim, the French sociologist who coined the term 'anomic' and according to him, for anomic to be resolved there must be a group which could provide a sense of kindredness and common purpose for its members (Bell Daniel, 1974, p.288).

"Actually in India the policy makers are unwilling to listen and unwilling to respond to the demands of the interest groups. Only when public order is endangered by a mass movement, is the government prepared to make a concession, not because they are convinced about the legitimacy of their demands, but because they recognise the strength of the group making the demands and its capacity of destructiveness". (Mahindra, K.C., 1974, p.197.)

For instance the creation of Andhra Pradesh, bifurcation of Bombay State and the creation of Maharashtra, Gujarat, Punjab and the reorganisation of Assam State by establishing five states in that region - all were the decisions made under great pressure of public protests, direct action and mass violence (Fadia Babulal, 1980, p.72). Thus, the use of violence and some radical extra-constitutional means by the organised groups is known as anomic behaviour. The techniques used by pressure groups include small public meetings, pestering, submitting memoranda, press statements, street corner meetings, long marches on foot, mass rallies, processions, mass deputations, torch light processions, hartals, strikes, picketing, satyagraha, dharna, fasting, destruction of public property, holding up of transport gherao, go-slow or work-to-rule, riots, looting of public or private property etc. (Sinha, K.K., 1988, pp.542-549). When the normal channel provided for removing the accumulated grievances prove to be ineffective, anomic actions are resorted to by these groups.

**8.7.10 Anomic pressure groups vs. other forms of pressure groups:** Anomic pressure groups differ from institutional pressure groups with regard to structure, functions and dynamics. They appear to be associational in forming a group to achieve particular objectives and are non-associational with respect to the tactics and strategies used for achieving objectives. Again anomic pressure groups are different from other types of pressure groups with regard to the spontaneous

emergence of groups <sup>which</sup> use violence and other extra constitutional methods to achieve set objectives.

8.7.11 Based on the classification of Almond and Powell, environmental pressure groups in Kerala may be categorised as associational groups in appearance because they form an association to achieve their objectives. Yet they exhibit the characteristics of a non-associational group as far as the background of the organisers are concerned i.e. the leaders and office-bearers are mostly intellectuals, academicians and professionals belonging to the educated middle class occupying positions in the intellectual and professional field. Basically most of the environmental protection pressure groups are anomic pressure groups in its strategies and tactics. Due to the following reasons, environmental protection pressure groups could be described as associational pressure groups in structure, but non-associational and anomic pressure groups in their strategies and role.

- Just like anomic pressure groups most of the environmental protection pressure groups are also spontaneous groups formed as a result of some issue. Chapter IV of the thesis presents a number of case studies to show the sudden emergence of environmental pressure groups as a consequence of environmental problems.
- Most of the environmental pressure groups in Kerala are not functional wings or sub-groups of any other organisation or association. The analysed data showed the groups' non-involvement in political parties and in socio-cultural

groups. Hence such groups received very little support from political and socio-cultural groups. The only exception to this observation is the Environmental Brigade of the Kerala Sastra Sahitya Parishad.

- A formal organisational structure is absent in environmental pressure groups in Kerala. Data collected from the respondents seems to be vague indicating that a formal organisational structure consisting of well defined channels of communication, status structure, role of the members etc. are nebulous and without any pattern.
- There are no restrictions pertaining to the membership of the groups. Anyone having interest in the issue can become a member of the group. Hence the group is non-associational. Most of the organisers and members are educated middle class people occupying positions in the intellectual/professional field. The educational qualifications of the members of various groups for environmental protection showed that most of the respondents were post-graduates.
- The environmental pressure groups in Kerala were task-oriented. Data collected from twentyfive environmental pressure groups showed that the group originated as a result of specific environmental problems. Most of the methods used by the environmental protection pressure groups were protest manifestations against environmental pollution rather than demand for maintaining environmental hygiene, they adopted adhoc task-oriented tactics, and not long term objective-oriented strategies.
- Environmental pressure groups in Kerala created a favourable climate for their particular cause by appealing to the public through speeches, pamphlets and special articles. Most of the environmental protection pressure groups have

resorted to this form in order to draw public awareness to environmental issues. This part of their methodology for creating an awareness for environmental hygiene could be considered as a strategy than a short run tactic.

- Again the strategies and tactics used by environmental pressure groups in Kerala are similar to those used by anomic pressure groups.
- Finally the list of case studies presented in Chapter IV of the thesis showed that environmental groups were more or less adhoc groups formed as a result of particular immediate problems rather than long term, and majority of the groups faded away after a certain stage. However, there are certain pressure groups like Kerala Sasthra Sahitya Parishad which are not anomic in nature but which exhibited a part of institutional/associational and/or non-associational characteristics. Because of the following characteristics the Kerala Sasthra Sahitya Parishad be termed as an institutional pressure group.

8.7.12           The Kerala Sasthra Sahitya Parishad has 250 units in various places in Kerala. Each district committee has several regional committees under it. Local units of the Parishad are found in towns, villages, schools and libraries. The general council is the controlling body of the organisation. Besides, there are committees at district levels, regional levels and local unit levels. There are six major sub-committees elected by the general council to assist the Central Executive Committee. They are:

- Publication Committee
- Committee for Rural Science Forums
- Nonformal Education Committee
- Formal Education Committee
- Health and Environment Committee, and
- Resources and Development Committee.

8.7.13            The associational characteristics of the Kerala Sastra Sahitya Parishad include the following:

- The group undergoes changes with the replacement of personnel.
- The group is a voluntary, non-profit making association and hence maintains a personal relationship between office-bearers and members.
- General council members are elected from among the primary members of the Parishad through the local units, one councillor for every 10 members.
- Remuneration is in the form of a prominent position in the group rather than salary and pension.

8.7.14            In spite of the above mentioned characteristics the Kerala Sastra Sahitya Parishad <sup>can</sup> be termed as a non-associational pressure group, since it represents the interests of a section of people who are interested in maintaining environmental hygiene.

8.7.15            Though the Kerala Sastra Sahitya Parishad exhibits a combination of characteristics of institutional/associational and/or non-associational from the structure, strategy

and dynamics of the group it could be said that such groups have been successful compared to other environmental protection pressure groups in Kerala.

### **8.8.0 Structural Characteristics of a Group**

**8.8.1** An examination of the structural characteristics of a group may show the factors that are essential for the effectiveness of the group. According to Krech and Crutchfield the effectiveness of a group depends "partly upon its structural characteristics - its size, member composition, status structure and channels of communication" (Krech and Crutchfield, 1962, p.458).

**8.8.2** "Group structure refers to a more or less stabilised system of interdependent relationships among individuals according to their respective contributions to interactions towards a common goal. These relationships are interdependent and reciprocal, linking a given individual with every other individual in the group in certain ways. In terms of the individual's respective contributions in various capacities relevant to the tasks, problems or goals significant in the interaction process, reciprocal expectations are stabilised for each member in relation to other members. These stabilised expectations of behaviour in the group define the roles of the group members" (Sherif, M., 1936, p.162). Similarly John McDavid and Herbert Marari define group structure "as the overall system of integrated position, role and status



relationships" (McDavid John and Herbert Harari, 1974, p.305).

According to Krech and Crutchfield;

"in all groups, the position, roles and powers of the members become differentiated and organized into a system - the group structure - which influences the functioning of the group and the satisfactions of the members" (Krech Crutchfield, 1962, p.410).

**8.8.3 Group dynamics:** When we study the group as a whole we are aware of changes which occur in the behaviour of individuals and how these changes are transmitted to all the individuals so that the behaviour of the group is altered. Some groups are more stable than others i.e. their structure tends to remain unchanged over a period of time. Other groups, on the contrary, undergo progressive changes even in the absence of significant variations in the external situation. Groups are especially apt to be unstable during the process of formation or of reformation as the aftermath of some significant change in the external environment.

"Instability arises out of conflict among individuals and among sub-groups within the whole group i.e. out of lack of balance among all the internal forces of the group" (Krech and Crutchfield, 1948, p.398).

As a consequence of the lack of balance among the internal forces in the group, changes in group structure occur. These changes seem to move in the direction of a reduction of the tensions until a more stable group structure is formed.

**8.9.0 Effectiveness of Pressure Groups: Structural and Other Characteristics**

**8.9.1 Group objectives:** Firstly, groups are held together because of common objectives of members and common beliefs that the objectives can be reached through the group. These objectives can be of two kinds viz. individual objectives and group objectives. There is a mutual relationship between the success of a group in attaining its group objective and its success in meeting the personal needs of its individual members. The objectives may be either positive or negative.

"Individuals ordinarily find relatively little satisfaction in participating in groups that persistently fail to reach collective goals" (Deutsch, 1958, pp.81-95).

"Groups that fail to satisfy the personal needs of individuals participating in the group usually tend to be relatively ineffective in attaining their collective objectives" (Schutz, 1958, pp.429-445).

Thus, groups may break up or die because they have no genuine objectives or the members do not believe that the objectives could be achieved. Lack of emotional bonds between the group and its members could also be one of the reasons for the failure of such groups.

**8.9.2** The objectives of the group devoted to environmental protection and preservation include the maintenance of environmental hygiene. Data collected from thirteen environmental pressure groups indicate that the groups attempted at

short-term tactics to express their protests against environmental pollution rather than adopting long-term strategies for maintaining environmental hygiene.

**8.9.3 Size of group:** The structure of a group is related to the number of participants. The smallest group is made up of two people. With a membership of three and more the size of the group increases with increase in complexities in its dynamics. The larger the group the more potentially complex can its structure and dynamics be. Sherif has indicated that four properties are essential in the formation and functioning of small informal groups. (Sherif, 1956, p.131).

- a) Common motives conducive to interaction among individuals.
- b) Differential effects of interaction on participants
- c) Formation of group structure consisting of rules and hierarchical statuses, and
- d) Standardisation of values or norms which regulate the relationships.

**8.9.4** The analysed data concerning the background of various environmental pressure groups in Kerala show that the Kerala Sastra Sahitya Parishad has over 7,000 members with clear pattern of interaction and role differentiations. Since the structure and formal line of communication and interaction of these pressure groups other than Kerala Sastra Sahitya Parishad are not clear in their responses, one may

infer that most of the pressure groups in Kerala do not show the four main characteristics mentioned by Sherif.viii.

**8.9.5 Leadership:** "With the very formation of a group, some members are almost certain to take a more active role than others, to be preferred to others, to be listened to with more respect than others, to be dominant over others. This is the beginning of the differentiation of group members into leaders and followers. As the group continues to grow, and especially as it becomes more stable, a more definite and established leadership - followership hierarchy appears. And as this happens, the role of the leader becomes more crucial for the functioning of the group" (Krech and Crotchfield, 1974, p.422). Leadership involves the execution of a particular kind of role, defined essentially in terms of power or the ability to influence others. In some groups, leadership may be concentrated in one individual, in others, it may be shared by a number of people. As a role, leadership may be more or less specific to the structure of the group. A leader in one group may not be a leader in another. As a group becomes larger it acquires more and more functions and necessary group goals which give rise to a hierarchy of leaders.

**8.9.6** Regarding the leadership of the environmental pressure groups, twenty-six of the respondents were leaders of the groups. Details pertaining to the pattern of leadership found in these groups have been discussed in Chapter VIII of

the thesis. The groups as such were not 'leader centered' but only 'task centered' and the leaders and members were primarily concerned only with specific programmes and activities formulated by the leader or committee leadership of the pressure groups.

8.9.7 Lines of communication and interaction: The most clearly evident aspect of structural organization within a group is the stabilization of lines of communication among members of the group. In an organized social system, even though each individual may be free to communicate with every other member of the group, the process of group organisation involves systematic utilization of these communication channels.

"Each participant does not interact equally often with each other participant, and stabilized lines of interaction become apparent" (John McDavid, 1974, p.286).

"As groups become organized, sub-groups cleavages, individual compatibilities and similarities of interest and other aspects of role relationships eventually tend to define a stable structure of channels of communication. This structure is called the communication net" (Harari Herbert, 1974, p.288).

Several theories from social psychology such as New Comb's A-B-X system, Heider's Balance theory and Festinger's theory of social comparison process are helpful in explaining and predicting group communication behaviour (Goldberg Alvin, 1975, p.59).

**8.9.8** Data collected from environmental pressure groups in Kerala showed that a formal organisational structure often observed in institutional and/or associational pressure groups is absent. The first part of Chapter VIII presents the background of 25 environmental groups in Kerala as reported by the leaders of the group. The analysed data prove the absence of formal lines of communication and interaction among the members. Groups like Kerala Sasthra Sahitya Parishad, however, are exceptions possessing a structural framework in contrast to other environmental groups in Kerala.

**8.9.9** Group norms: Group norms and standards afford regulation of both the structure and function of groups. The effective and efficient performance of a group depends on its structural properties and adequacy of regulative mechanisms within the group. These regulative mechanisms are derived from values that are in accordance with the movement of the group toward its goals and with maintenance of structural characteristics within the group. Vague norms or standards impede the effectiveness of the group in attaining its goals (Coch and French, 1948, pp.512-513). When an individual deviates from group norms and standards there is a disruption in the group as well as interference with the group structure. In general, the success of a group, both in its efforts as a system as well as in satisfactions to its individual members, is highly dependent on the adequacy of its regulative norms and standards (McDavid John, 1974, p.319).

8.9.10 Data pertaining to the background of various environmental pressure groups in Kerala showed that group norms and standards were not specific and clear in many cases. Membership was open to anyone having interest in environmental protection and/or hygiene. Members of the group were free to leave or to enter at their own free will without any financial and/or other obligations. However, exception was found in the case of environmental group of the Kerala Sastra Sahitya Parishad. The Parishad membership is open to all science enthusiasts who are above 18 years. The membership fee is Rs.5/- per annum. An amount of Rs.1/- is levied as admission fee. Life membership is offered to members who remit Rs.100/- in advance. Application for membership should be in the prescribed form which is available from all units where the Kerala Sastra Sahitya Parishad is functioning. The members can subscribe for any or all of the publications of the Parishad at specially subsidized rates. As for the Parishad set-up, no one is eligible to hold an office for more than two years in the same capacity (Kerala Sastra Sahitya Parishad, 1981, pp.4-26).

measurable dimension of group structure, but a descriptive summary of a number of attributes of a group's organization" (McDavid John, 1974, p.290). One general term used to describe the climate of various groups include "group centered" or 'leader centered'. Group centered climate involves a great deal of mutual attraction among members, strong adherence to collective group norms and standards, strong identification of individual members with the group as a system, and warm and enthusiastic interactions. In contrast, leader centered climates involve loose organization of the group, with tendencies for individual members to orient their behaviour toward the influence of a controlling leader rather than toward one another. Group-centered climates are associated with what might be called democratic organization within the group, whereas leader-centered climates are associated with autocratic organization (Harari Herbert, 1974, pp.290-291).

8.9.12 Data collected from environmental pressure groups in Kerala showed that groups were 'task-centered'. Chapter IV of the thesis presents a number of case studies showing the spontaneous development of groups when environmental issues arose. These adhoc groups were concerned only with short-term tactics for achieving their immediate goals.

8.9.13 Morale is an indication of the level of functioning of the group. Morale depends upon the proper integration of certain motivational, emotional and cognitive



factors in each of the individuals making up the group. In order that group morale be high the members must have strong needs, they must believe that the group can function so as to satisfy their needs, and they must feel a sufficient degree of emotional involvement with the group. According to Watson "Morale first of all, demands a magnetic pole towards which the aspirations of men are drawn." In the absence of clear overall objectives, groups cannot hope to achieve a high order of synthesis and will easily disintegrate. Better group morale can be expected in groups that function to permit the optimal degree of feelings of participation, self expression and recognition on the part of its members. Lewin (1942) has pointed out that the relationships between high morale and long range time perspective is reciprocal i.e. not only does a long range time perspective help maintain high morale in a group, but a group that has high morale, for whatever reason, also tends to develop a long range time perspective.

8.9.14 Like the concept of group atmosphere, the concept of morale or cohesiveness is a multi-dimensional composite characteristic of a group structure. A suitable general definition of cohesiveness is that it is the "resultant of all the forces acting on all the members to remain in the group" (Carl Wright and Kander, 1960, p.74). The specific dimensions that might contribute to this

resultant include such factors as the attraction of individual members to one another, the attraction of individual members to the activities and functions of the group, and even the extent to which the individual is attracted to the group as a means of satisfying his own personal needs. "The greater the cohesiveness of the group, the clearer the definition of its boundaries and sharper the distinction between members of the group and non-members. Cohesive groups with well-defined boundaries are more difficult to enter and leave than non cohesive groups. There is greater resistance to threat of disorganization in cohesive groups. The greater the difficulty in achieving entry into a group, the greater the value attached to belonging to it, and the greater the adherence to its norms" (Harari Herbert, 1974, p.293).

8.9.15 Data collected from 13 environmental protection pressure groups indicate lack of strong cohesiveness within the group, for there was no clear cut boundaries of the group structure regarding norms and membership. The groups were primarily task-oriented rather than member-oriented. They were attempting short term tactics rather than long term objectives for maintaining environmental hygiene. The membership characteristics also indicate low level of commitment to objective of the group. People who are strongly affected by environmental pollution are the local people including industrial workers and managers. However, membership in most of the environmental

protection groups is widely dispersed away from the centre of action and affected parties of environmental pollution. Local <sup>farmers</sup> and industrial workers of Eloor and Kalamassery are not members of such environmental protection groups, which itself is a clear indication of the low level of commitment of the members to the basic objectives of the group. Eloor-Kalamassery industrial belt is a good example of the non-involvement of local people in such environmental protection groups. However, involvement of local people was found high in other places like Mavoor and Vellore. The presence of local communities or pressure groups functioning at local levels to protest against environmental pollution, show that the cohesiveness and morale of groups resorting to short term tactics against a specific agency could be high with certain immediate action programmes.

#### **6.9.16 Role of differentiation within the group structure:**

How an individual behaves toward other members of the group depends partly upon the personality of the individual and partly upon the nature of the group structure and his assigned or assumed role within that structure. Similarly, how the individual is perceived and reacted to by others is also partly dependent upon his role. The term role refers to the dynamic aspects of a position i.e. the actual behaviour displayed by individuals who occupy the position. The obvious fact about most groups is that they are made up of sub groups. Groups are not usually homogeneous within, but are characteristically

divided into parts that are relatively homogeneous and tend to differ from the other parts. Thus leaders and followers are differentiated and the members of the group have different responsibilities.

8.9.17 The presence of educated middle class members who occupy important positions and various roles outside the environmental protection group may create conditions for the presence of a number of sub groups within the environmental protection group. In other words, positional roles outside the group may create cliques and sub groups within an associational group such as the environmental protection group, especially when there is no homogeneity in the background of the members of such environmental groups.

#### 8.10.0 Strategies and Tactics Used by Environmental Protection Groups

8.10.1 Behaviour of a large number of individuals towards a common goal of temporary nature is often described as collective behaviour by sociologists and social psychologists. Audience behaviour, mob behaviour, social movements etc. are illustrations of such collective behaviour. According to Milgram and Toch "it refers to group behaviour which originates spontaneously, is relatively unorganised, fairly unpredictable and planless in its course of development, and which depends on interstimulation among participants (Milgram and Toch, 1969, p.507).

**8.10.2** Groups generally use propaganda to arouse the attention of others. "Propaganda is the technique of influencing human actions by the manipulation of representations as proposals for action along new lines arise to compete for moral and physical support of the masses, propaganda attains convenience as the one means of mass mobilisation which is cheaper than violence, bribery or other possible control techniques" (Krech and Crutchfield, 1948, p.316). The chief medium through which propaganda operates is language, whether spoken or written. Political speeches, writings, advertising and mass education are different forms of propaganda used to arouse public awareness.

**8.10.3** Strategies and tactics used by environmental protection groups in Kerala have been discussed in detail in the earlier part of this chapter under 8.4.0. The groups have succeeded in creating an awareness of the perils of industrial pollution and on the need for a better environment through their long term strategies of education, training and research publications especially to influence the educated middle class professionals. These groups had also resorted to short term tactics through their action programmes such as dharna, stayagraha, protest march, publication of news items on environmental problems in mass media to influence the public especially the affected parties. However, such social action programmes of these environmental protection groups could be

made effective and conspicuous only when the groups could identify the agency assumed to be responsible for causing environmental pollution and other forms of environmental deterioration.

**CHAPTER - IX****9.0.0 SUMMARY AND CONCLUSIONS**

**9.1.0**           The scope of the present study undertaken by the researcher is confined to "Environmental Protection Pressure Groups in Kerala", with Special Reference to Industrial Pollution. The main purpose of the study is to identify the factors that make pressure groups succeed or fail in achieving their set objectives. The factors include the structure and strategies of such pressure groups and the role they play in the socio-political life of an industrial environment. The scope of the study covers the following specific areas:

**9.1.1**           Perception of and reaction to environmental hygiene, environmental pollution and tactics and strategies adopted by pressure groups against environmental pollution, by the relevant segments of the public, medical practitioners, veterinary surgeons, local farmers, managers, worker trade union leaders and environmental protection groups.

**9.1.2**           Origin, development, structure and role of pressure groups for environmental protection functioning within the Eloor-Kalamassery industrial belt.

9.1.3 Strategies and tactics adopted by environmental protection groups in Kerala to achieve their objectives.

9.1.4 Regulatory framework and public interest litigation relating to environmental pollution with special reference to the role of environmental protection pressure groups in Kerala.

### 9.2.0 Selection of the Sample

9.2.1 People who are directly affected by industrial pollution are the industrial employees, managers, <sup>and</sup> farmers.

Experts who can <sup>Observe</sup> the harmful effects of pollution <sup>are</sup> medical practitioners and veterinary surgeons.

In addition, people who are directly involved in organising people against industrial pollution and environmental deterioration are also in a position to provide information on various aspects of pollution. Considering these various segments, the researcher has selected the following segments for eliciting data on various problems of pollution.

9.2.2 Population and samples: Regarding the medical practitioners and veterinary surgeons the entire population in the area was taken for the study. A scientific sample was drawn in the case of farmers. Three major chemical units were selected for taking the sample of managers and trade union leaders. All the <sup>Internal</sup> Presidents, Secretaries and Vice-Presidents of eleven trade unions from the three units were taken for the study. Regarding the managers, a 20 per cent



sample of senior level managers from the three units was selected after preparing a comprehensive list of managers in alphabetical order. The leaders of twentyfive environmental protection groups in Kerala were selected for eliciting information on environmental problems.

### 9.3.0 Methodology

9.3.1 Personal interviews were held with some selected segments of the <sup>public in</sup> Eloor-Kalamassery area for the preparation and testing of the questionnaire. Primary data were collected through such refined and tested questionnaires for eliciting responses from medical practitioners, veterinary surgeons, farmers, social groups for environmental protection, managers and trade union leaders. Secondary data and data collected directly by the investigator were used for the preparation of six case studies.

### 9.4.0 Limitations of the Study

9.4.1 The main focus of the study is confined to the Eloor-Kalamassery industrial belt, but since the number of organised environmental protection pressure groups in this area was found limited, other areas in Kerala have been included.

9.4.2 Though there are 16 chemical units in Eloor-Kalamassery area, only the three major important chemical units in the Udyogamandal area have been considered to get personal viewpoints of managers and worker trade union leaders

9.4.3 Since the development of environmental pressure groups in Kerala is a recent phenomenon, adequate literature on the subject was not available and hence literature pertaining to developed countries like United States had to be made use of.

9.4.4 The managements of the chemical units in Eloor-Kalamassery area were reluctant to reveal their reactions to environmental problems in the area. This lack of co-operation on the part of management forced the researcher to elicit reactions of managers as individuals, rather than as formal officials of the companies.

#### 9.5.0 Presentation of the Thesis

9.5.1 Chapter I dealt with the nature and characteristics of the pressure groups in a pluralistic-democratic society. Consumerism and groups demanding employment opportunities are the areas which have been introduced to show the role of pressure groups in changing management decisions. The chapter also discusses the scope, methodology, limitations and definitions of main concepts used in the thesis.

9.5.2 Chapter II discussed in detail the nature, characteristics and consequences of environmental pollution on man, animals, plants, materials and climate.

9.5.3 Chapter III dealt with the environmental protection at the international and national scenes.

**9.5.4** Chapter IV presented six case studies of environmental protection groups in Kerala.

**9.5.5** The regulations laid down by the government for ensuring environmental protection and some environmental litigation cases are presented in Chapter-V.

**9.5.6** Chapter VI presented the nature, characteristics and consequences of pollution in Eloor-Kalanassery area as perceived by the relevant segments of the society.

**9.5.7** Chapter VII presented the reactions of the relevant segments to issues on environmental pollution.

**9.5.8** Chapter VIII gives the structure, strategies and role of environmental protection groups in Kerala for achieving their objectives. The structure, strategy and role of pressure groups are also discussed within a theoretical framework.

**9.6.0** Major Conclusions Derived from this Study are as follows:

**9.6.1** Most of the environmental pressure groups functioning in Kerala are anomic and associational pressure groups in their characteristics, rather than institutional. Anomic pressure groups work on ad hoc problems and issues. They resort to short term action programmes to achieve an immediate goal and usually with the achievement of the

objectives, such groups become <sup>inactive</sup> dominant. However, associational groups continue to exist even though they do not achieve their specific goals.

9.6.2 An adhoc, anomic pressure group may show cohesiveness in its immediate action programmes against a known agency as a target, but the group does not continue for want of long term objectives, structure or role differentiation and norms for its continuity. Some groups such as the Periyar Bund Action Council which came into existence on an immediate issue melted away after a certain stage.

9.6.3 Most of the environmental pressure groups in Kerala have their members from educated middle class professionals.

9.6.4 There are no rules and norms for enrolling individuals as members. The only exception to this observation was the Kerala Sastra Sahitya Parishad which laid down some minimum criteria for accepting individuals as members.

9.6.5 The directly-affected parties viz. industrial workers, managers, farmers and other local residents are not active members of the environmental pressure groups functioning in Kerala.

9.6.6 There is no definite pattern of interaction among the members in the form of regular meetings except immediate action programmes organised against the management of a concern.

9.6.7 Leadership of such environmental pressure groups in Kerala is more 'task oriented' than 'member oriented'. Task oriented groups usually fade away after achieving their immediate objective. Continuity of such groups is blocked by absence of member oriented style of the leaders.

9.6.8 Environmental pressure groups in Kerala did not affiliate themselves with other organizations of similar nature or political parties. The only exception to this is the Kerala Sastra Sahitya Parishad. In a developing society with political democracy, anomic, non-associational and associational pressure groups can survive and grow only with direct or indirect support of political parties and/or by other strong, well established organizations.

9.6.9 The environmental pressure groups in Kerala did not get direct or indirect support from trade unions.

9.6.10 Adhoc, anomic pressure groups can maintain their cohesiveness by the presence of an immediate objective or by the presence of an agency for direct confrontation. When the target is vague, the strength of the group gets diluted. This was the case with the 12 environmental

protection/conservation groups. In such cases, the group found it difficult to maintain its cohesiveness. In Eloor-Udyogamandal area, where most of the chemical factories are situated, it was difficult to distinguish a single agency responsible for pollution of the area. On the other hand in Calicut and Velloor the environmental pressure groups could succeed in directing the confrontation to specific agencies assumed to be responsible for environmental pollution.

9.6.11 Litigations filed by the Eloor-Panchayat against Indian Rare Earths factory is an illustrative case in Eloor-Kalamassery area where pressure groups could identify and isolate the agency responsible for environmental issues. Except this single case, there was no evidence in the Eloor-Kalamassery area to identify the industrial unit responsible for pollution.

9.6.12 Most of the environmental protection pressure groups resorted to dharna, protest march, submission of memorandum and other short term tactics against the management of the industrial organisations. Such short term tactics were not resorted to by environmental protection/conservation groups in Kerala.

9.6.13 The environmental protection pressure groups did not resort to tactics or long term effective strategies

in pressurising the enforcing agencies of the government such as Air and Water Pollution Control Boards; nor did they make significant attempts at influencing the government through political parties.

9.6.14 Another strategy the environmental pressure groups could have resorted to was approaching the judiciary for enforcement of existing laws for environmental protection and taking action against those who are violating the norms. However, majority of the environmental pressure groups in Kerala did not resort to litigation.

9.6.15 The Kloor-Kalamassery area is considered the most polluted area in Kerala but still the number of environmental groups working for environmental protection in this area were found to be limited and without any support from the affected parties.

9.6.16 Though we find many of the environmental pressure groups functioning in Kerala to be ineffective in influencing the decisions of the management, they were considered very effective in creating an environmental consciousness among the public through their publications, research studies and short term tactics. This contribution of the environmental pressure groups in Kerala - whatever be its nature and structural characteristics - is considered a really significant contribution for further effective action for the maintenance of a better environment free from industrial pollution.

**9.7.0 Scope for Further Research**

**9.7.1** This is the first study on the social significance of environmental protection groups. There is ample scope for further detailed studies on various aspects of the environmental problems and the role of amonic, non-associational and associational pressure groups. The effectiveness of such groups with and without the support of political parties is to be explored. Some other areas for detailed explorations are:

**9.7.2** Health problems of industrial employees in selected industrial units with a purpose to identify the characteristics of industries that contribute to pollution caused diseases.

**9.7.3** Studies of the life span and health problems of people residing in industrial areas in comparison with people residing away from industrialised centres.

**9.7.4** Effectiveness of non-associational and amonic pressure groups with and without the support of political parties.

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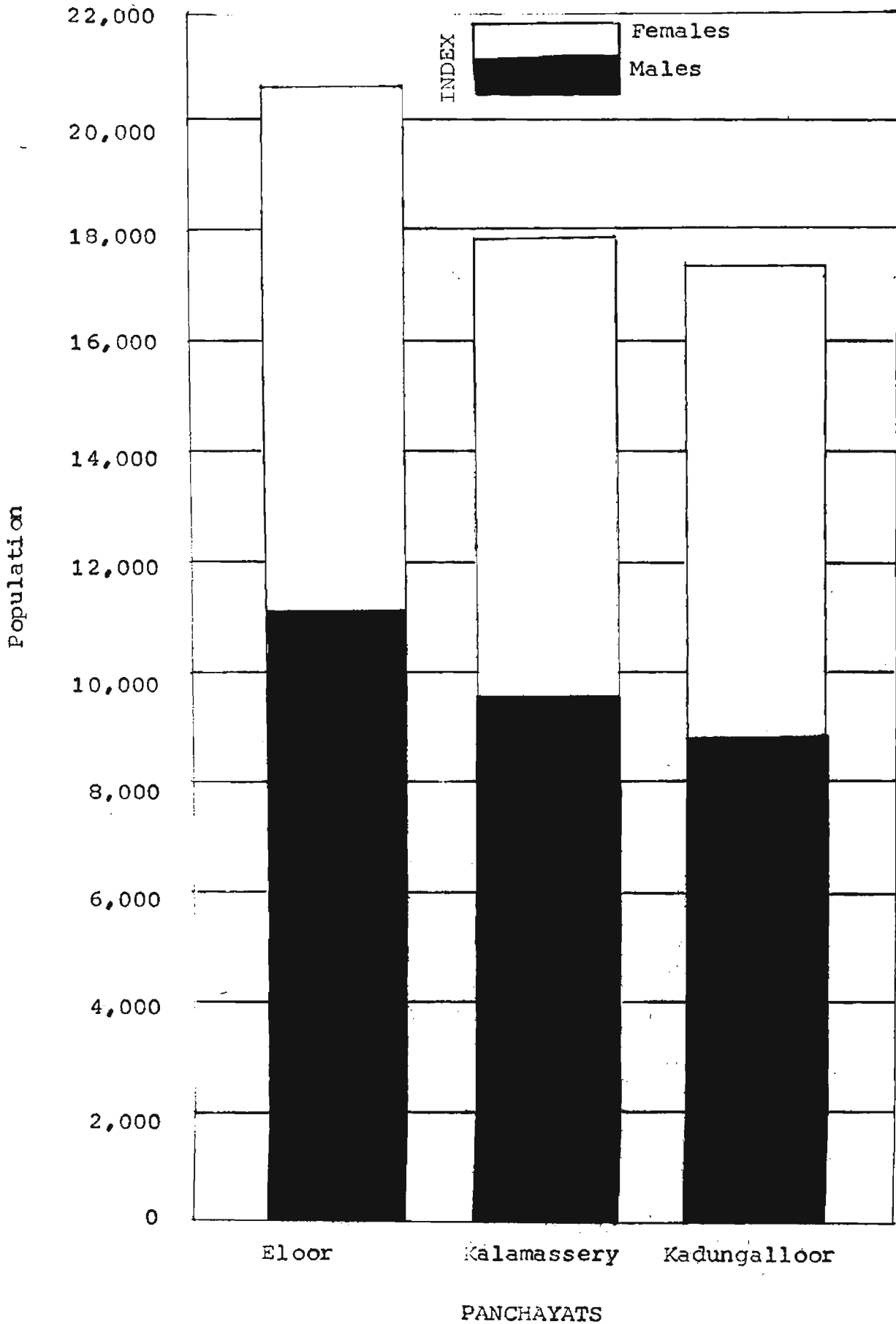
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POPULATION DISTRIBUTION IN ELOOR-KALAMASSERY INDUS-  
TRIAL BELT



SAMPLE QUESTIONNAIRE FOR MEDICAL PRACTITIONERS

- 1.0 Name
- 1.01 Address of your professional practice (Hospital/Clinic/dispensary etc.) X  
X  
X
- 1.02 Specialization, if any (additional professional qualification) X  
X  
X
- 1.03 Years of service in the locality (present area) X  
X
- 1.04 No. of years since residing in the locality X  
X
- 2.0 What categories of people frequently visit you for treatment? X  
X  
X  
(Please mark  inside the appropriate boxes)
- 2.01 Industrial employees :
- 2.02 Agricultural labourers :
- 2.03 Fishermen :
- 2.04 Coolies or physical labourers :
- 2.05 Government employees :
- 2.06 Managers/Supervisors (Industrial) :
- 2.07 Self-employed professionals :
- 2.08 Businessmen :
- 2.09 Farmers :
- 2.10 Students :

3.0 Out of these categories mentioned above -

3.01 Majority of the patients belong to (please name the category) X . . . . .  
 X  
 X . . . . .

3.02 Minority of patients belong to X . . . . .  
 X  
 . . . . .

4.0 Are these patients who come to you for treatment residents of this locality? X  
 X  
 X

- 4.01 All of them :
- 4.02 Most of them :
- 4.03 Some of them :
- 4.04 None of them :

5.0 From your experience would you say that certain types of diseases are more frequent or pronounced among the patients who come to you? X  
 X  
 X YES/NO

5.01 If 'Yes', do you feel that such common/frequent diseases are contributed by certain environmental factors? X  
 X  
 X  
 X YES/NO

5.02 If 'Yes', please specify the nature of such diseases?

- 5.03 Tuberculosis :
- 5.04 Asthma :
- 5.05 Bronchitis :
- 5.06 Tonsillitis :
- 5.07 Dermatitis :
- 5.08 Hypertension :
- 5.09 Ear problems :

- 5.10 Gastric irritation :
- 5.11 Allergic disorders :
- 5.12 Eosinophilia :

6.0 Out of these categories mentioned above

6.01 The most common disease is : \_\_\_\_\_

6.02 The least common disease is : \_\_\_\_\_

7.0 Do you feel that the presence of a large number of chemical industries in the locality contribute to the occurrence of certain diseases mentioned above? X YES/NO  
X  
X  
X

7.01 If 'Yes', what is the nature and consequence of pollution and what factor is detrimental to the health?

- 7.02 Chlorine :
- 7.03 Sulphur dioxide :
- 7.04 Carbon monoxide :
- 7.05 Fluorine :
- 7.06 Ammonia :
- 7.07 Sulphuric acid fumes :
- 7.08 D.D.T. :
- 7.09 Mercury :
- 7.10 Radiation :

8.0 Out of the categories mentioned above

8.01 The most dangerous one is : . . . . .

8.02 The least dangerous one is : . . . . .

- 9.0 Many people may not come to you for treatment of a disease but still their health conditions are affected by environmental pollution. According to you what is the long term effect of such environmental pollution on the health of individuals?
- 9.01 Chronic diseases may often occur due to lack of early preventive measures :
- 9.02 Minor but recurring diseases may occur :
- 9.03 People become health conscious and take preventive measures :
- 10.0 Do you feel that the diseases caused by environmental pollution can be cured by proper medical attention? X YES/NO  
X  
X
- 10.01 If 'No', what other substitute treatment can be given? X  
X
- 10.02 Symptomatic treatment :
- 10.03 Any other (Please specify) : . . . . .
- 11.0 What are your suggestions for eliminating the effect of Environmental Pollution on health/diseases?
- 11.01 Immediate medical attention :
- 11.02 Removal of the person from the source of pollution :
- 11.03 Legislations on environmental hygiene :
- 11.04 Availability of modern medical facilities :
- 11.05 Regular medical check up :
- 11.06 Maintenance of environmental hygiene by local bodies (Corporation, Municipality, Panchayat) :
- 11.07 Neutralizing the pollution effect at the industrial unit level :

- 11.08 No possibility for a better environment under the present conditions :
- 11.09 Detecting the pollutants that cause diseases and concerted effort by all agencies for neutralizing the effect of such pollutants :
- 11.10 Grow more trees :
- 11.11 Any other (please specify) : . . . . .

12.0 Is there an organized group within the locality which voice their protest against the agencies that contribute to Environmental Pollution? X  
X  
X  
X  
YES/NO

If 'Yes', please provide information on:

- 12.01 Name of the groups/associations and their addresses:
- 12.02 Name of leaders/prominent members and their addresses:
- 12.03 Programmes they have undertaken such as protest march, dharna, submission of memorandum to government and various agencies, publications, public meetings etc.:

Additional Questions

13.0 Are you employed by any of the industrial units in the locality?

If 'Yes', please give the nature of such employment contracts?

13.01 Name of the Organisation/Organizations:

13.02 Full time :

- 13.03 If part time
- 13.031 Predetermined days per week: . . . . .
- 13.032 Predetermined hours per day: . . . . .
- 13.04 Employees directed by the management to report to your clinic:
- 13.05 Any other (please specify): . . . . .

14.0 Categories of employees who come to you from the industries for treatment:

- 14.01 Workers
- 14.02 Their relatives
- 14.03 Supervisors
- 14.04 Their relatives
- 14.05 Managers
- 14.06 Their relatives

15.0 From your experience would you say that certain types of diseases are more frequent among industrial employees?  YES/NO

If 'Yes', please specify the nature of such disease?

- 15.01 Asthma
- 15.02 Bronchitis
- 15.03 Tuberculosis
- 15.04 Dermatitis
- 15.05 Allergic disorders
- 15.06 Eosinophilia
- 15.07 Any other (please specify): . . . . .

16.0 Please give your suggestions and personal comments on "Health and Environmental Hygiene" (additional opinions/informations not covered in the questionnaire).

SAMPLE QUESTIONNAIRE FOR VETERINARY SURGEONS

- 1.0 Name
- 1.01 Address of your professional practice
- 1.02 Specialization, if any (additional professional qualification)
- 1.03 Years of service in the locality (present area)
- 1.04 No. of years since residing in the locality
- 2.0 What types of animals are brought to you for treatment
- 3.0 From your experience would you say that certain types of diseases are more frequent or pronounced among the animals that are brought to you.  YES/NO
- 3.01 If 'Yes', do you feel that such common/frequent diseases are contributed by certain environmental factors?  YES/NO
- 3.02 If 'Yes', please specify the nature of such diseases?
- 4.0 Do you feel that the presence of a large number of chemical industry in the locality contribute to the occurrence of certain diseases mentioned above?  YES/NO
- 4.01 If 'Yes', what factor is detrimental to the health? What is the nature and consequences of Environmental Pollution?
- 4.02 Chlorine
- 4.03 Sulphur dioxide



- 4.04 Carbon monoxide
- 4.05 Fluorine
- 4.06 Arsenic
- 4.07 Sulphuric acid fumes
- 4.08 D.D.T.
- 4.09 Ammonia

5.0 Out of the categories mentioned above

5.01 The most dangerous one is : . . . . .

5.02 The least dangerous one is: . . . . .

6.0 Many owners may not bring their animals to you for treatment of a disease but still their health conditions are affected by environmental pollution. According to you what is the long term effect of such environmental pollution on the health of animals.

6.01 Chronic diseases may often occur due to lack of early preventive measures

6.02 Minor but recurring diseases may occur

7.0 Do you feel that the diseases caused by environmental pollution can be cured by proper medical attention?  YES/NO

7.01 If 'No', what other substitute treatment can be given?

7.02 Symptomatic treatment:

8.0 What are your recommendations <sup>for</sup> eliminating the effect of Environmental Pollution on health of animals ...

8.01 Legislations on environmental hygiene:

8.02 Availability of modern medical facilities:

- 8.03 Neutralising the pollution effect at the industrial unit level:
- 8.04 Grow more trees
- 9.0 Is there an organised group within the locality which voice their protest against the agencies that contribute to Environmental Pollution?  YES/NO
- 9.01 If 'Yes', please provide information on:
- 9.02 Name of the groups/associations and their addresses:
- 10.0 What are the tactics and strategies used by these groups?

LIST OF GROUPS WORKING IN KERALA FOR ENVIRONMENTAL  
PROTECTION

1. Cochin Science Association - Cochin
2. Friends of the Trees - Cochin
3. Save Silent Valley - Cochin
4. World Wildlife Fund - Cochin
5. Cochin Environmental Protection Agency - Cochin
6. Malabar Flora and Fauna Society - Cochin
7. Society for Ecological Conservation and Development - Cochin
8. Public Interest Law Service Society - Cochin
9. Eloor Panchayat - Eloor
10. Periyar Bund Action Council - Eloor
11. Organisation for Protection from Nuclear Radiation -  
- Kothamangalam
12. Thekkady Wildlife Society - Thekkady
13. Quilon Environmental Group - Quilon
14. High Range Wildlife Preservation Association - High Range
15. Society for Environmental Education in Kerala - Tellicherry
16. Society for the Protection of Surroundings - Vellore
17. Panchayat Samithi - Vellore
18. Centre for Development Studies - Trivandrum
19. Prakriti Samrakshana Samithi - Trivandrum
20. Kerala Sastra Sahitya Parishad - Trivandrum
21. Mitranikethan - Trivandrum
22. Society for Protection of Environment, Kerala - Calicut

23. Parisara Samrakshana Ekopana Samithi - Calicut
24. Environmental Protection Co-ordination Committee - Calicut
25. Committee for the Advancement of Legal Literature  
- Calicut.

SAMPLE QUESTIONNAIRE FOR ENVIRONMENTAL PROTECTIONPRESSURE GROUPS

- 1.0 Name :
- 1.01 Age :
- 1.011 25-34 years :
- 1.012 35-44 years :
- 1.013 45 years and above :
- 1.02 Sex : Male/Female
- 1.03 Address (Local) :
- 1.04 Educational Qualifications:
- 1.041 Postgraduate :
- 1.042 Graduate :
- 1.043 S.S.L.C. :
- 1.044 Below S.S.L.C. :
- 1.05 No. of years since residing in the locality: . . . . .
- 1.06 Name of the organisations of which you are a leader/member:
- 1.061 Political
- 1.062 Socio/cultural
- 1.063 Professional
- 1.064 Environmental Protection
- 2.0 Do you feel the presence of a large number of industries create problems to the local people?  YES/NO
- 2.01 If 'Yes', please elaborate:

- 2.011 Unhealthy environment which causes diseases to people, animals and plants
- 2.012 Destruction of vegetation
- 2.013 Uninhabitable place
- 2.014 Any other, please specify:

3.0 Is there a collective effort on the part of people to raise their voice against such problems?  YES/NO

3.01 If 'Yes', please give details about the group or organization and their methods of demands/protests.

	<u>Name of group</u>	<u>Demands</u>	<u>Methods used</u>
3.011	. . . . .	. . . . .	. . . . .
3.012	. . . . .	. . . . .	. . . . .
3.013	. . . . .	. . . . .	. . . . .
3.014	. . . . .	. . . . .	. . . . .
3.015	. . . . .	. . . . .	. . . . .

4.0 What is the involvement of cultural/social/professional associations/political parties on such protests/demands:

- 4.01 No involvement :
- 4.02 Indifferent :
- 4.03 Supporting :
- 4.04 Any other:

5.0 What is your personal involvement in such groups or organizations who have come forward to protest against environmental pollution:

- 5.01 No involvement :
- 5.02 Active supporter of the group :

- 5.03 Leader of the group :
- 5.04 Member of the group :
- 5.05 Any other, please specify:
- 6.0 If you are an active participant or leader, then please give the following information:
- 6.01 History of the organization:
- 6.02 Role of participants: (Office-bearers of the Association for the protection of the environment)
- 6.03 Personal background of leaders and members: (Name, address, occupation and educational qualifications)
- 6.04 The political party to which you belong?
- 6.05 Strategy and tactics adopted by the group:
- 6.051 Protest march :
- 6.052 Newspaper publications :
- 6.053 Submission of memorandum :
- 6.054 Legal procedures :
- 6.055 Any other, please specify :
- 7.0 What was the attitude or reaction of the management to demands and protests of the group?
- 7.01 Sympathetic :
- 7.02 Ignored :
- 7.03 Indifferent :
- 7.04 Any other, please specify :
- 8.0 What was the attitude of the Government/High Level authorities to the demands of the group?

- 8.01 Supporting the management :
- 8.02 Supports the group :
- 8.03 Impartial :
- 8.04 Indifferent :
- 8.05 Any other:
- 9.0 Did the leader or any other member take the case to court?  YES/NO
- 9.01 If 'Yes', what was the outcome of the case?
- 9.011 It was in favour of the management:
- 9.012 It was in favour of the group :
- 9.013 It is still pending in the court :
- 9.014 Any other:
- 10.0 Please write the effectiveness of your group in terms of achievements:
- 10.01 Completely successful :
- 10.02 Partially successful :
- 10.03 Total failure :
- 10.04 Cannot say anything at this stage :
- 11.0 Reasons for the success:
- 11.01 Full support and Co-operation from the local people :
- 11.02 Support from political parties and other groups :
- 11.03 An effective strong association for the purpose :
- 12.0 Reasons for the failure of the group:



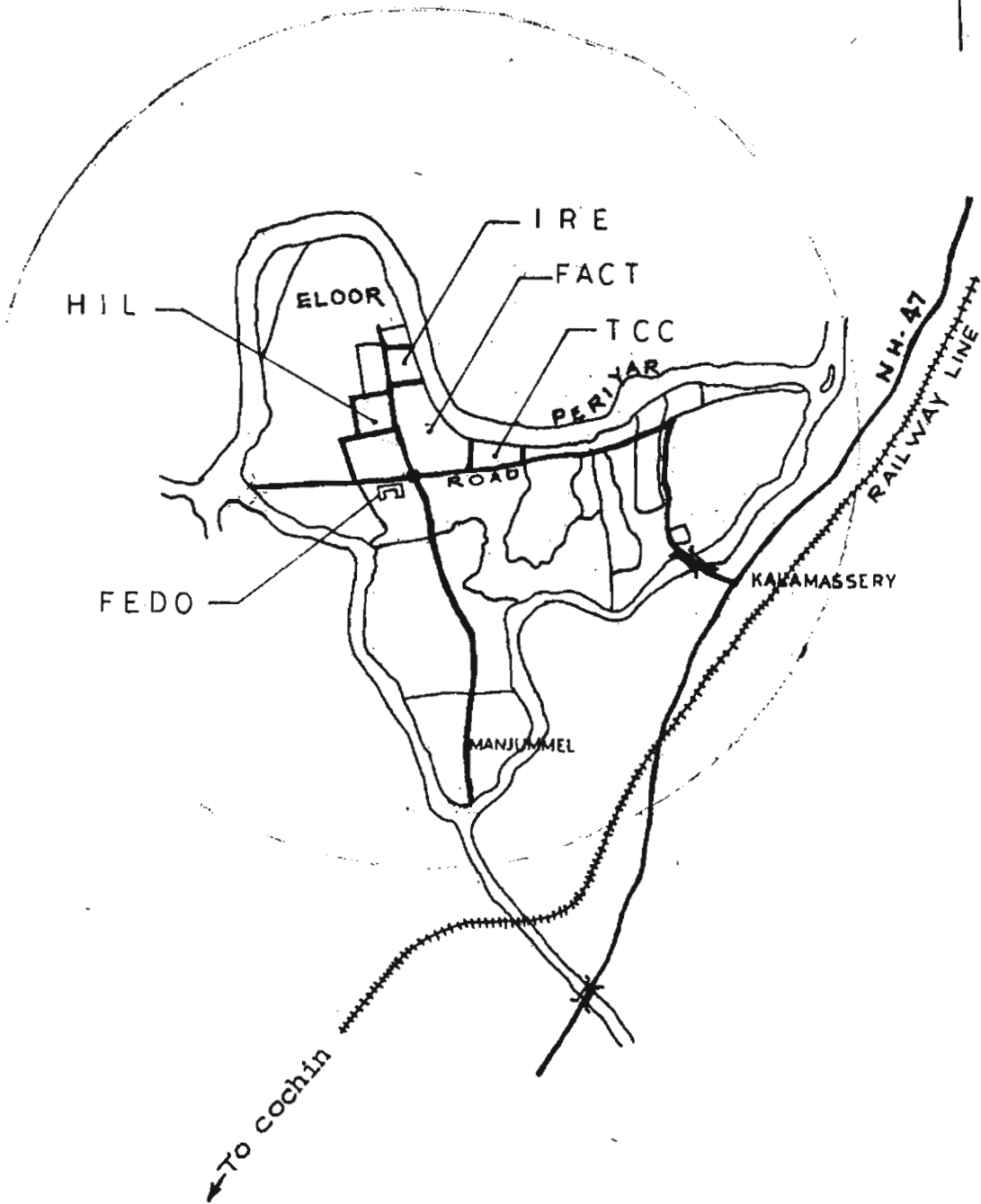
- 12.01 Ineffective association :
- 12.02 Strong management :
- 12.03 Lack of support from local peoples:
- 13.0 Do you feel such pressure groups could be made permanent or do you think they will wither?
- 13.01 They could be made permanent :
- 13.02 They will wither :
- 13.03 Any other:
- 14.0 Is there a counter group or association which work against the environmental protection group?
- 14.01 If 'Yes', kindly give details of such groups:
- 15.0 Is there other groups in the locality with the same objectives? YES/NO
- 15.01 If 'Yes', do you get their support? YES/NO
- 16.0 What are the counter movements by Management?
- 16.01 Newspaper publications :
- 16.02 Indifferent :
- 16.03 Aggressive action against the group :
- 16.04 Trying to buy the prominent leaders by promises of employment:
- 16.05 Any other:
- 17.0 What are the future plans of the group devoted to Environmental Protection?

Place:  
Date :

\_\_\_\_\_  
SIGNATURE

AREA COVERED FOR TAKING THE SAMPLE OF FARMERS

489



SCALE : 1 INCH = 1 MILE

SAMPLE QUESTIONNAIRE FOR FARMERS

- 1.0 Name :
- 1.01 Age :
- 1.011 25-34 years :
- 1.012 35-44 years :
- 1.013 45 years and above :
- 1.02 Sex : Male/Female
- 1.03 Educational Qualifications:
- 1.031 Postgraduate :
- 1.032 Graduate :
- 1.033 S.S.L.C. :
- 1.034 Below S.S.L.C. :
- 1.04 Address (Local residence) Permanent address or other  
mailing address if any:
- 1.05 Number of years since residing in your locality: . . . .
- 1.06 Total area under cultivation (in acres): . . . . .
- 1.07 Types of Crops cultivated:
- |       | <u>Crops</u> | <u>Area (Acres)</u> | <u>Annual Income</u> |
|-------|--------------|---------------------|----------------------|
| 1.071 | Paddy        |                     |                      |
| 1.072 | Coconut      |                     |                      |
| 1.073 | Areca nut    |                     |                      |
| 1.074 | Vegetables   |                     |                      |
|       | Any other:   |                     |                      |
- 1.08 Categories of animals in your household and their numbers:

- |       | <u>Animals</u>  | Yes/No   | If 'Yes', total numbers  |
|-------|---|----------|--------------------------|
| 1.081 | Cows  |          |                          |
| 1.082 | Buffaloes   |          |                          |
| 1.083 | Goats   |          |                          |
| 1.084 | Oxen  |          |                          |
| 1.085 | Poultry animals   |          |                          |
| 2.0   | Do you feel the presence of a large number of chemical industry nearby create problems to your Crops/animals?   |          |                          |
|       | Crops   | : Yes/No |                          |
|       | Animals   | : Yes/No |                          |
| 2.01  | If 'Yes', what is the nature and consequences of pollution?   |          |                          |
| 2.02  | Causes diseases to people/animals/plants:   |          | <input type="checkbox"/> |
| 2.03  | Destruction of vegetation   | :        | <input type="checkbox"/> |
| 2.04  | Poor yield from land/animals  | :        | <input type="checkbox"/> |
| 2.05  | Uninhabitable place for people  | :        | <input type="checkbox"/> |
| 2.06  | Smoky atmosphere  | :        | <input type="checkbox"/> |
| 2.07  | Polluted waterways  | :        | <input type="checkbox"/> |
| 3.0   | Did you personally lodge a complaint with the Management of the industry responsible for pollution? <span style="float: right;">X<br/>YES/NO<br/>X</span> |          |                          |
| 3.01  | If 'Yes', what was the nature of such complaints?   |          |                          |
| 3.02  | What were the actions you resorted to for redressing your grievance?  |          |                          |
| 3.021 | Submission of memorandum  | :        | <input type="checkbox"/> |
| 3.022 | Legal procedure   | :        | <input type="checkbox"/> |

- 3.023 Newspaper publications :
- 3.024 Dharna :
- Any other:
- 4.0 What was the attitude of the Management to your such demands/protests?
- 4.01 Tried to give compensation :
- 4.02 Tried to please by other means :
- 4.03 Defensive in their position :
- 4.04 Positive with follow-up action :
- 4.05 Sympathetic :
- 4.06 Indifferent :
- 5.0 Did you approach any association/government agency with your complaints?
- YES/NO
- 5.01 If 'Yes', name of the local association:
- 5.02 Name of the government agency:
- 5.03 Trade Unions:
- 5.04 Local association of farmers:
- 5.05 Local associations for the protection of Environment:
- 5.06 Political party/parties:
- Any other:
- 6.0 What was the reaction of these associations/agencies to your requests?
- 6.01 Oral support with no follow-up action :
- 6.02 Positive with follow-up action :

- 6.03 Gave employment to family members :
- 6.04 Sympathetic :
- 6.05 Ignored :
- 6.06 Indifferent :
- Any other: (Please specify): . . . . .

7.0 Is there a collective effort on the part of farmers to raise their voice against pollution problem?

YES/NO

- 7.01 If 'Yes', please specify giving details of such groups/associations:
- 7.02 Name of the group/association:
- 7.03 Members of the group/association:
- 7.04 Leaders/office bearers of the group/association:

8.0 What is your personal involvement in such groups/associations who have come forward to protest against environmental pollution?

- 8.01 No involvement :
- 8.02 Active supporter of the group :
- 8.03 Leader of the group :
- 8.04 Member of the group :
- 8.05 Silent supporter :
- Any other: (Please specify): . . . . .

9.0 If you are an active participant or a leader, then please give the following information:

9.01 History of the organization (Year of establishment, people who took initiative, progress made so far etc.)

- 9.02 Present office bearers of the association:
- 9.03 Methods adopted by the group/association:
- 9.031 Protest march :
- 9.032 Legal procedures :
- 9.033 Newspaper publications :
- 9.034 Submission of memorandum :
- Any other: (Please specify). . . . .
- 10.0 How often do the group/association meet?
- 10.01 Frequently :
- 10.02 Occassionally :
- 10.03 Seldom :
- 10.04 Never :
- 11.0 What was the attitude of the Management to the demands/protests of the group?
- 11.01 Positive with follow-up action :
- 11.02 Sympathetic, but without any action :
- 11.03 Defensive in their position :
- 11.04 Indifferent :
- Any other (Please specify): . . . . .
- 12.0 What was the attitude of the government/officials to the demands of such groups?
- 12.01 Supported the Management :
- 12.02 Supported the group :
- 12.03 Indifferent :
- Any other (Please specify): . . . . .

13.0 Did the group approach any political party?  YES/NO

13.01 If 'Yes', please mention the name of the political party:

14.0 Did the leader or the members take the case to court?  YES/NO

14.01 If 'Yes', what was the outcome of the case?

14.02 It was in favour of the Management:

14.03 It was in favour of the group :

14.04 It is still pending in the court :

Any other (Please specify): . . . . .

15.0 Did the group succeed in redressing their grievances relating to Environmental Pollution? YES/NO

15.01 If 'Yes', what was the degree of success?

15.011 Completely successful :

15.012 Partially successful :

15.013 Total failure :

15.014 Cannot say anything at this stage :

Any other (Please specify): . . . . .

16.0 Is there another group or association with the same interest for protesting the Environment?  YES/NO

16.01 If 'Yes', do you get their support? : YES/NO (Please give the background of such groups/associations and the nature of their supports to your association)



- 17.0 Is there a counter group or association in the locality which tries to block your efforts for a pollution free-environment?  YES/NO
- 17.01 If 'Yes', please give the addresses and activities:
- 18.0 Your general observation of the functioning of the environmental protection group in your locality:
- 19.0 Your suggestions and comments on the problems of industrial pollution:

SAMPLE SCHEDULE FOR MANAGERS AND TRADE UNION LEADERS

- 1.0 Name :
- 1.01 Age :
- 1.011 25-34 years :
- 1.012 35-44 years :
- 1.013 45 years and above :
- 1.02 Educational Qualifications :
- 1.03 Number of years since residing in the area:
- 2.0 Most people say that pollution in this area is really acute affecting the health of people and growth of vegetation. Do you agree with this observation?

YES/NO

If 'Yes', please elaborate the nature, source and consequences of pollution in the area and the type of industry causing pollution?

- 3.0 Are you aware of the existence of some groups in the area for the protection of environment?

YES/NO

If 'Yes', which are these groups? What are the tactics used by these groups against the management of industrial units? and how successful are they in their efforts?

- 4.0 Many people say that the management of industrial units do not seriously consider the protests and demands of the environmental pressure groups. Do you agree with this observation?

YES/NO

If 'Yes', why is it that the management is indifferent to environmental pressure groups?

5.0 It is often said that inspite of the detrimental effect of pollution on health the workers and trade union leaders have not come out to support the environmental pressure group. Do you support this observation? Please elaborate your opinion on this issue.

6.0 What are your suggestions and recommendations for eliminating Environmental Pollution?

