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STRENGTHENING OF ENVIRONMENTAL PROTECTION CAPABILITIES IN THE COUNTRIES OF WESTERN ASIA

Institutional Organization

84-0763

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Introduction

The objective of this paper is to review institutional issues of environment in countries of the ECWA region. The paper is composed of four major sections.

The first section constitutes a brief presentation of environmental problems on both the national and regional level. The purpose of the presentation is to focus on present and potential problems which require measures to curb, solve or manage them. This presentation is not intended to be comprehensive but rather to serve as a background for the scope and pattern of environmental problems which need to be dealt with in the organizational functions and structures of environmental institutions.

The second section contains a review of how the countries of ECWA region responded to environmental problems at both the national and regional level. The section looks into how each country has translated its response into legislative measures, institutional organization, and/or implementation units. The review will contain an analysis of the appropriateness of response of each country to environmental issues and problems, the efficiency of the measures taken, and the constraints facing each country in the way it has been dealing with such issues and problems.

The third section constitutes a proposal of an environmental organizational model to be considered by each country of the ECWA region for possible improvement of its existing environmental institutions or perhaps for possible adoption of those aspects of the model that are pertinent to its specific needs. The model focuses on functional units dealing with environmental, organizational and institution-building issues which include strategies, policies, planning, legislation, programming, financial support, co-operation, co-ordination, manpower development, implementation, monitoring and evaluation.

The fourth section is a section on conclusions and recommendations for further action to be carried out by ECWA as a follow-up to this study.

Methodology

The methods followed in the preparation of this study paper were as follows:

First: Country visits. Selected countries of the ECWA region were visited, officials concerned with the environment were interviewed and documents pertinent to the study were collected. The countries visited specifically for the purpose of the study were Kuwait, the Yemen Arab Republic,

Saudi Arabia and Jordan. Other countries visited in connection with this study were Egypt, Qatar and Iraq. Annex I shows the programme of the visits, which included interviews with individuals and visits to institutions.

Secondly: Questionnaire and collected references and materials. A questionnaire especially prepared for this study was sent to other countries not visited and replies were received from Bahrain, the United Arab Emirates, the People's Democratic Republic of Yemen, Oman, Lebanon and Syria. Documentation pertinent to environmental legislation and organization was received and used for reference in the preparation of this study.

Thirdly: References and other documents available to consultants for various national, regional and international organizations were also used in the preparation of this study. Documents available included those from UNESCO, the United Nations Environment Programme (UNEP), ECWA, the Arab League Educational Cultural and Scientific Organization (ALECSO), the Regional Organization for the Protection of the Marine Environment in Kuwait, the Red Sea and Gulf of Aden Environmental Programme, and the Co-operation Council for Gulf Arab States. A list of references used in the study is annexed.

1. Environmental problems in the ECWA region

1.1 Introductory remarks. The countries of the ECWA region have witnessed many changes and developments during the last 35 years which have influenced the various elements of the environment. During this period, the population in countries of the region has doubled and reached about 95 million in 1984. The increase in population was accompanied by a marked increase in economic activities unprecedented in the history of the region. Among the economic developments with environmental impact have been the following: mining; transport and processing of oil; processing of phosphate and other minerals; construction of dams and irrigation schemes; expansion in cultivated areas under rainfed and irrigation conditions; expansion in a variety of industrial projects; mushrooming of housing schemes and public facilities; and unprecendented expansion in urban centres. Such fast changes and developments were not without environmental problems. Some environmental problems were already present but have been exacerbated, while many new ones have been created. The major problems will be reviewed in the following paragaphs.

1.2 Desertification. Perhaps the most important environmental problem which is common to the majority of ECWA countries is desertification. The term desertification is used here in the widest sense. It is the process of transforming productive land resources into non-productive ones. The transformation is brought about mainly through human actions. Such actions include overcultivation, deforestation, overgrazing of rangelands and nonscientific use of water for irrigation which leads to salinity. During the process of desertification the land is stripped from its plant cover, leaving the topsoil exposed to erosion. Desertification is a multidimensional problem. It leads not only to the loss of productive land, but it has a negative impact on ground-water recharge, air pollution, sand dune movement and leads to the extinction of plant and animal forms of life.

Desertification in many countries of the ECWA region is an old problem, but it has been accelerated in recent years as a result of intensified human activities. Notable among such activities are:

(a) The invasion by man in many ECWA countries of marginal lands for cultivation. This is true of countries such as Jordan, Syria and Iraq.

(b) The improper use of water for irrigation. Such a practice has lead to soil waterlogging, continued evaporation of water from the soil surface and eventually the accumulation of salt in the topsoil. This is happening in various degrees in irrigated lands of Egypt, Iraq, Syria, Saudi Arabia, the People's Democratic Republic of Yemen, Qatar and Oman.

(c) Overgrazing and deforestation are two activities that have been practised for a long time in many of the countries of the region. Many steppe lands once covered with forest ecosystems have been stripped from their cover in Jordan, Syria, Iraq and the Yemen Arab Republic. In addition, the decreasing size of rangeland available to herds of camels, goats and sheep has increased the grazing pressure of such animals on vegetation. What makes matters worse is that vegetation in marginal lands of all ECWA countries grows under an ecosystem which is extremely sensitive to negative changes. Table 1 shows the extent to which desertification has become a problem in countries of the ECWA region.

1.3 Deterioration of marine life and pollution of coastal marine waters. Marine life in coastal waters of many countries of the ECWA region have suffered major setbacks. In addition coastal waters are increasingly subject to the threat of pollution. The major causes of deterioration and degradation are:

(a) Overexploitation of edible forms of marine life (fisheries) through uncontrolled methods of fishing;

(b) Uncontrolled methods of picking corals and other non-edible forms of marine life;

(c) Pollution of marine waters as a result of oil from ships as well as oil spillage during transport and on-shore exploration.

(d) Pollution of marine waters through wastes of ship maintenance operations in shipyards;

(e) Pollution of marine waters as a result of inland-based sources of industrial wastes, sewage and other urban wastes.

Table 1. The importance of four major causes of desertification in each of the ECWA countries

Country	Spread of desertification as a result of: Deforestation	Overgrazing of range	Overcultivation of marginal	Soil salination
Bahrain	+	++	–	+
Egypt	+ (Sinai)	++ (Sinai)	–	++
Iraq	++	+++	+++	++++
Jordan	++++	+++	++++	+
Kuwait	–	++	–	++
Lebanon	+	+	+	+
Oman	+	+++	+	++
Qatar	–	+++	–	+++
Saudi Arabia	+	+++	–	++++
Syria	++	+++	+++	++
United Arab Emirates	–	+++	–	+++
Yemen Arab Republic	+++	++	+	+
Yemen, People's Democratic Republic of	+	+++	–	+++

Symbol: ++++ Largest scale + Smallest scale – Not important or not applicable

Perhaps the most outstanding problem of marine life deterioration and marine water pollution is that of the waters of the Arabian Gulf. The waters in the Gulf are almost in a land-locked situation where movement of water in and out to the ocean is minimal.

The extent to which marine life and marine waters are threatened by deterioration and pollution in waters bordering ECWA countries is summarized in table 2.

1.4 Deterioration of inland animal and plant wildlife. Although part of this problem was touched upon under desertification, it does stand on its own as an important environmental problem. Plant and animal natural ecosystems have been deteriorating in all ECWA countries and have fallen to alarming levels in some. Many forms of animal life, particularly mammals, have become extinct in many countries of the region. The Arabian oryx, the ostrich, the Syrian Ass, several species of gazelles, lions and tigers are among those animals which have become extinct in many countries of the region. A small number of these animals, notably the Arabian oryx and the gazelle, are kept in captivity in some countries of the region. Mammals and birds such as the houbara Bustard, species of Arabian gazelles, Egyptian vultures and partridges top the list of many threatened animal species in countries of the region. The situation has come about because of uncontrolled hunting practices and gross mismanagement of wildlife in the past.

Table 2. Levels of deterioration of marine life and water pollution in coastal waters of ECWA countries

Deterioration of marine life and water pollution as a result of:				
Country	Overexploitation of marine life	Oil spillage	Industrial wastes	Urban wastes
Bahrain (Gulf)	+	++	++	+
Egypt (Red Sea)	+	+	+	–
Egypt (Mediterranean)	++	+	+++	+++
Iraq (Gulf)	++	+	++	+
Jordan (Aqaba Gulf)	+++	+	++	+
Kuwait	+++	+++	+++	++
Lebanon (Mediterranean)	++	+	+	+
Oman (Gulf)	++	+	–	+
Qatar (Gulf)	++	+	++	+
Saudi Arabia (Red Sea)	+	+	+	+
Saudi Arabia (Gulf)	+	+++	++	+
Syria (Mediterranean)	+	+	+	+
United Arab Emirates (Gulf)	+	++	+	+

Table 2 (Cont'd)

Deterioration of marine life and water pollution as a result of:				
Country	Overexploitation of marine life	Oil spillage	Industrial wastes	Urban wastes
Yemen Arab Republic (Red Sea)	•	•	-	•
Yemen, People's Democratic Republic of	•••	•	••	•

Symbol: •••• Largest scale • Smallest scale - Not signifcant

Plant wildlife is not in a better position than animals. There are few surviving natural forest ecosystems in countries of the region. The vegetative cover of vast arid areas has been subjected to systematic destruction in some countries, as a result of overgrazing, ploughing of marginal lands and the transformation of these land areas with rare ecosystems into irrigated ones. Many medicinal and edible wild plants are becoming threatened because of overexploitation. The extent to which plant and animal wildlife have suffered from man's activities in countries of the ECWA region is summarized in table 3.

Table 3. The degree to which animal and plant wildlife have deteriorated in countries of the ECWA region

Scale of deterioration of plant and animal wildlife in countries of ECWA region as a result of:					
	Uncontrolled hunting of:		Uncontrolled exploitation of:		
Country	Mammals	Birds	Range-lands	Forests	Medicinal and edible plants
Bahrain	••••	••	•••	•	••
Iraq	••••	•••	•••	••	••
Jordan	••	••	••••	•••	••
Kuwait	••••	•••	•••	-	••
Lebanon	••••	•••	-	•	•••
Oman	•••	•••	•••	••	•••
Qatar	•••	•••	••••	-	•••

Table 3 (Cont'd)

Country	Scale of deterioration of plant and animal wildlife in countries of ECWA region as a result of: Uncontrolled hunting of: Mammals	Birds	Uncontrolled exploitation of: Range-lands	Forests	Medicinal and edible plants
Saudi Arabia	++++	+++	++++	++	+++
Syria	++++	+++	++	++	++
United Arab Emirates	++++	+++	+++	++	++
Yemen Arab Republic	++++	+++	+++	+++	++
Yemen, People's Democratic Republic of	++++	+++	++++	++	++

Symbol: ++++ Largest scale + Smallest scale - Not significant

1.5 Pollution of fresh water. Fresh water is perhaps the scarcest of all other natural resources in the countries of the ECWA region. Sources of water (other than rainfall) that are available to agricultural production, household and industrial usages in countries of the region are:

(a) Dams and rivers which are present in Egypt, Lebanon, Syria and Iraq;

(b) Water streams, water springs and reservoirs which are present in Lebanon, Syria, Jordan, the Yemen Arab Republic, the People's Democratic Republic of Yemen, Oman and Saudi Arabia;

(c) Underground water which is found in all countries of the region in varied quantities and qualities;

(d) Desalinated water which is available in Saudi Arabia, Kuwait, the United Arab Emirates and Qatar.

The degree to which sources of fresh water are being polluted varies from one country to another in the region. The degree of pollution also varies from one region to another within the country depending on the proximity and degree of exposure of water to sources of pollutants. Evidence of underground pollution is limited except in areas fed by urban areas as in Jordan and Syria. Pollution of surface water is already a major problem in many areas and has an alarming potential.

The main sources of pollution are:

(a) Toxic materials and solid wastes from industry and public facilities which include compounds of mercury, lead, cyanide, copper and other heavy metals;

(b) Biological pollutants which come mainly from untreated sewage water, slaughterhouse wastes, food production industries, and animal production farms. The major pollutants are protozoa, invertebrates, bacteria, and viruses that cause disease to man, animals and plants;

(c) Oil pollutants which come mainly from car service stations, inland-based oil refineries, power plants and other oil-fueled power units of industries;

(d) Pesticides used in plant protection and urban and household pest control;

(e) Other organic materials from trees, animal wastes, soil erosion and other solid wastes from urban centres.

The scale of surface fresh water pollution from main sources of pollutants is summarized in table 4.

1.6 Deterioration of balance and salinization of underground fresh water. The increased demand for water for agricultural, industrial and household usage is posing a threat to the balance and quality of underground water in many of the countries of ECWA region. The causes of this threat may be summarized as follows:

(a) Over the years much of the sources of underground water recharge have deteriorated because of man's overexploitation and mismanagement of these sources. Activities of man which lead to deforestation, deterioration of plant cover in water courses, deterioration of vegetation in rangelands and the weak efforts to build terraces and earth dams in water courses have all contributed greatly to the decrease of underground water recharge. Thus on one hand the input for water recharge has decreased.

Table 4. Scale of surface fresh water pollution from four major sources of pollutants in countries of the ECWA region

Country	Scale of pollution as a result of: Chemical pollutants	Biological pollutants	Oil pollutants	Pesticides and other sources
Bahrain	-	-	-	-
Egypt	++	+++	+	+
Iraq	++	+++	+	+
Jordan	+++	++	+	+
Kuwait	-	-	-	-
Lebanon	+	+	+	+
Oman	+	+	+	-
Qatar	-	-	-	-
Saudi Arabia	++	+++	++	-
Syria	++	+++	+	+
United Arab Emirates	-	-	-	-
Yemen Arab Republic	+	++++	+	+
Yemen, People's Democratic Republic	+	+	+	+

Scale symbol: ++++ Significant scale +++ Moderate + Minor scale
- Not applicable or not significant

(b) On the other hand, pumping of underground water has increased. In some instances overpumping of underground water is practised indiscriminately and with little or no monitoring. The outcome of these threats is salinization of underground water, distrubance of underground water and eventually the loss of water balance both in quality and quantity.

The scale of deterioration of balance and salinization of underground water in countries of the ECWA region is shown in table 5.

Table 5. Scale of deterioration of underground water in countries of the region

Country	Scale of deterioration as result of recharge		
	Weak sources	Overpumping	Salinazation
Bahrain	+++	+++	++
Egypt	++	++	+
Iraq	++	+	+
Jordan	+++	+++	++
Kuwait	++	++	++
Lebanon	+	++	+
Oman	+++	+++	+++
Qatar	++++	++++	+++
Saudi Arabia	++++	++++	+++
Syria	++	++	+
United Arab Emirates	++	++++	++++
Yemen Arab Republic	++	++	+
Yemen, People's Democratic Republic of	+++	++++	+++

Scale symbols: ++++ Significant + Minor level

1.7 Air pollution. The oldest and perhaps the most important air pollutants in the ECWA countries are sand, clay and other soil particles carried by the air. The reason for this is well known since much of the areas surrounding human settlements are barren. The main sources of such air pollutants are as follows:

(a) Natural sands which have not been fixed. The result is sand dune movement which is common in Egypt, particularly in Sinai, and in Iraq, Kuwait, Saudi Arabia, Qatar and the United Arab Emirates;

(b) Deforestation and deterioration of plant cover and mismanaged cultivation in rangelands which lead to exposure of topsoil to wind erosion;

(c) Mining of stones, stone crushing, and movement of vehicles on unasphalted roads are another source of such pollutants in many major urban centres.

The other sources of air pollutants are as follows:

(a) Gases and other solid particles emitted by vehicles, trains and planes;

(b) Gases and other solid particles arising from chimneys of industrial plants which include steel mills, aluminium mills, oil refineries, food processing plants, fertilizer plants and cement factories;

(c) Gases and other solid particles arising from chimneys of heating furnaces, fuel oil, electricity power generating plants using fuel oil as a source of energy;

(d) Gases and other solid particles arising from gas flaring of oilfields.

The scale of air pollution in major urban and industrial centres in countries of the ECWA region is shown in table 6.

Table 6. Air pollution and its major causes in countries of the ECWA region

Country	Scale of air pollution as result of				
	Sand and clay particles	Gases and other solid particles from Gas flaring	Industries	Heating furnaces	Vehicles
Bahrain	++	+	++	–	++
Egypt	++++	–	++	–	++++
Iraq	+++	+	++	–	++
Jordan	++	–	+	+	+++
Kuwait	++++	+	++	–	++
Lebanon	+	–	+	–	++
Oman	+++	+	–	–	+
Qatar	++	+	+	–	++
Saudi Arabia	+++	++	+	–	++
Syria	++	–	++	++	+++
United Arab Emirates	+++	+	+	–	++

Table 6 (Cont'd)

Country	Scale of air pollution as result of: Sand and clay particles	Gas flaring	Gases and other solid particles from Industries	Heating furnaces	Vehicles
Yemen Arab Republic	+++	-	-	-	+
Yemen, People's Democratic Republic of	+	-	+	-	+

Scale symbols: ++++ Largest scale + Smallest scale
- Not significant.

1.8 Problems of occupational health hazards. The environment under which labourers work in countries of the ECWA region has not been without problems, as, for example, the following:

Labour poisoning. Labourers working in certain industries, without proper health and safety measures, have become exposed to poisoning by toxic materials. Labourers working in leather tanneries and battery manufacturing plants have suffered in some countries from poisoning. Others working in the open in some Gulf States have also suffered from heat stress during certain days of the year when excess heat and moisture create unpleasant conditions. Those labourers working in chemical industries have also suffered because of poor safety measures.

It is not intended to deal with this subject here in detail and specificity, but rather bring out this problem as one that should be taken into consideration when planning institutions which deal with environmental protection.

1.9 Food contamination and food poisoning. Production, handling and processing of food materials also have their problems, which are environmental in nature. The first type of problem is the contamination of food materials by disease-causing microbes. The sources of these contaminations might be one or more of the following:

(a) Exposure of plant food materials to irrigation water contaminated by sewage water;

(b) Exposure of food during its preparation to contamination coming from disease-carrying individuals;

(c) Exposure of food materials to contaminated utensils and/or containers.

The second type of problem is the contamination of food materials by poisonous chemicals. The sources of these contaminations may be one or more of the following:

(a) Pesticide residues on plant materials harvested before recommended duration for the breakdown of such pesticides;

(b) Chemical compounds in food kept in cans or containers beyond its expiry date;

(c) Chemical compounds in containers used for food preparation, transport or storage.

Again it should be emphasized that such problems are brought out here merely to indicate that they exist in countries of the region and should be taken into consideration when setting up functions and duties of environmental protection machinery.

1.10 Noise. The most important sources of noise in the human environment in ECWA countries are those caused by traffic. There is evidence in many urban centres of ECWA countries that noise from traffic in streets previously considered to be residential has increased beyond normal limits. Institutions of environmental protection must deal with problems especially in the context of urban planning.

1.11 Environmental problems of urbanization and regional planning. Most of the environmental problems resulting from uplanned urbanization and poor regional planning have been discussed before. Such problems include sewage and water pollution in urban centres, solid wastes from household and public utilities, and noise.

Urbanization in itself is not looked upon here as a negative development except inasmuch as it contradicts national objectives of development. However, because of the speed at which urban centres have developed and because of the poor regional and environmental planning, a range of problems has developed. Such problems do have a negative impact on environment. An example of these problems are:

(a) Loss of agricultural land. Fertile and scarce land suitable for food production has been taken over by housing schemes and other public utilities in many major urban centres of the ECWA region. Perhaps the most outstanding example is in the case of Egypt.

It has been estimated that the areas of fertile and good quality agricultural land which have been lost (put out of production) to urban centres along the Nile are equal to those which have been added as a result of irrigation schemes of the Aswan Dam.

Furthermore, the new reclaimed lands are lower in quality and productivity than those taken over by urbanization. The loss of agricultural land to urban centres has been also acute in Jordan (Amman and Irbid), Syria (Damascus and Aleppo), Iraq (Baghdad and Basrah), Yemen Arab Republic (Sana'a) and Lebanon (Beirut).

(b) Loss of sources of recharge for underground water. The transformation of agricultural land for housing schemes on one hand and the overpumping of underground water to meet increased demand of urban centres on the other have created a situation where the balance of underground water is being disturbed. This is true of places such as Amman in Jordan, Damascus in Syria and Sana'a in the Yemen Arab Republic.

(c) Unbalanced expansion of urban centres. Many industries, slaughterhouses and other public facilities that are sources of environmental hazards have become surrounded with housing schemes as a result of unplanned expansion of urban centres. The economic repercussions of relocating such industries, as well as the high costs of environmental management of such a mix, are two results of unplanned urbanization.

Problems such as these, as well as others, should again be taken into consideration when defining the functions of environmental protection institutions.

2. Institutional organization of environmental protection in countries of the ECWA region

2.1 Introductory remarks. Faced with environmental problems discussed in the first section of this study, the countries of the ECWA region have responded in variable degrees of national commitment and in variable forms of institutional organizations of environmental protection. The organizational measures taken, as well as institutions created, to meet the needs of each country in solving its environmental problems will be summarized in this section. In addition, constraints and gaps in the institutional organization in each country will be highlighted. Institutional issues common to more than one country will also be discussed.

2.2 Common institutional issues of environmental protection.

(a) Spheres of environment. Environment encompasses a variety of fields which touch a large number of disciplines and activities. Elements of environment are common to all. Land and its resources are common to many institutions. It is the resource for food production, for forests, for range and pasture production and it is a place on which houses, industries, parks and other public facilities are constructed. Water is another natural resource which is the concern of many institutions. Likewise other elements of environment represent many dimensions which involve a variety of concerns and institutions. Therefore it is vital when building institutions for environmental protection to define terms of reference and to clarify borders and responsibilities.

Kuwait Law No. 62 for the year 1980 (see annex V) regarding protection of the environment defines the environment as: "the biosphere including man, animal and plant together with all surroundings, air, water, soil, and what they contain in the form of solid, liquid, gas or radiation plus fixed or mobile structures built by man".

Omani Law No. 10 for the year 1982 regarding environmental protection and prevention of pollution defines environment as follows: "groups of systems, elements and natural materials which man utilizes or deals with at work, at home or in recreational and touristic places and which influence him or are influenced by him. It includes without being limited to: air, water, soil, terrestrial wildlife, marine life, food materials, various mineral or chemical materials, sources of energy and various social elements".

The Webster dictionary defines environment as: "the surrounding conditions, influences or forces that influence or modify: as a: the whole complex of climatic, edaphic, and biotic factors that act upon an organism or an ecological community and

ultimately determine its form and survival.... b: the aggregate of social and cultural conditions (as customs, laws, language, religion and economic and political organization) that influence the life of an individual or community".

Professor Kassas of Egypt has published many works on environment. One of his descriptions of environment, which has been translated and summarized for its significant contribution to this study is as follows:

"Environment is the frame in which man lives and in which he carries out his social and production activities. Environment is the store of resources and the comprehensive reservoir of renewable resources (productive ecosystems: agriculture, range, forests and water life) as well as non-renewable resources (minerals, oil, underground water). Natural resources include land and what it contains of raw materials, water (seas, rivers and underground water), and air (climate, winds and gases). All of these resources are subject to changes with time both quantitatively (increase or decrease) or qualitatively (for better or for worse) with respect to man's interest".

Environmental pollution and environmental protection must also be defined for the purpose of defining institutional functions and organization. Again the definition used by Oman in its law No. 10 for 1982 on environmental pollution is worth quoting and it is as follows: "Environmental pollution means: any change or harm, which is extreme but incidental or which is small but lasting, in the environmental systems or elements (mentioned in terminology of environment) or in its quality to the degree that makes it unfit for useful utilization in the purposes intended for it, or to the extent that its use may lead to social, economic or health harm in Oman either in the short or long term".

It is important to mention here that the purpose of going into definitions in this context is to clarify ambiguities regarding institutional responsibilities. Elaboration on these aspects will be presented in the third section of this study, especially on those functional responsibilities that are pertinent to countries of the region.

(b) Historical development of functions and activities bearing on environment. Although awareness of contemporary environmental problems is a recent development, some of these problems were addressed in the overall functions of well-established institutions. Health problems that are of an environmental nature, for example, have been part of the responsibilities of the Ministry of Health in almost all countries of the region. Some aspects of management of natural resources such as rangelands, forests, water and soil have also been part of the responsibilities of the Ministry of Agriculture in countries such as Jordan, Egypt, Iraq, Syria and Saudi Arabia. The

same can be said about occupational hazards of labour, industrial pollution and regional planning. All countries of the region were faced with such issues when establishing new institutions for environmental protection and management. Each country has been faced with the situation of fragmentation of functions related to environmental protection among several well-established institutions that are not specialized in environmental protection. When considering options for consolidating functions under the umbrella of one specialized institution in environmental protection, countries of the region have taken different courses.

(c) Institutional status of environmental protection. Another issue faced by the majority of countries of the region is that environmental protection has not gained enough recognition to stand on its own as an independent institution with appropriate autonomy.

(d) Inconsistency between legislative acts and implementation. There are great inconsistencies, at this stage of institutional development, between what is intended and planned on the one hand and what is being implemented on the other. There are many reasons for such inconsistencies which should be studied. Such reasons may be economic constraints, paucity of trained manpower on a national level, and/or undeveloped concepts of environmental institution building. It is hoped that this study may clarify courses and measures needed to establish implementing agencies for environmental protection.

2.3 <u>How countries of the ECWA region have responded nationally to deal with environmental protection on the institutional level.</u> Under this part, presentation will consider institutional functions as they exist on the national level in each country including:

(a) Strategy or policy-formulating bodies for environmental protection and conservation;

(b) Planning and co-ordination;

(c) Public awareness, information and education;

(d) Manpower development and research;

(e) Implementation structures and functions covered under their mandate as they exist at present;

(f) Gaps, constraints and remarks.

2.3.1 Bahrain

(a) Formulation of policy, including who should deal with environmental protection and conservation, is the responsibility of the Council for for Environmental Management. Created in 1980 and attached to the Prime Minister's office, the Council comprises 10 members representing 8 ministries, namely: Health; Housing; Interior; Education; Communications; Agriculture and-Commerce; Development and Industry; and Public Works and Electricity and Water. The two other members represent the Central Municipalities Committee and the Bahrain National Oil Company. The Council is in the process of organizing its activities and the Directorate of Public Health in the Ministry of Health is temporarily acting as executive secretariat.

(b) Planning and co-ordination of environmental protection is also the responsibility of the Council. However, there is little evidence that such functions are being practised in a way that is consistent with the needs.

(c) Public awareness and environmental information are not handled by any specialized agency. Any activity related to this is handled as a marginal function by the public information media. No formal or informal educational programme on environment is implemented in schools, or in Bahrain University College.

(d) There are no national plans being implemented on environmental research or manpower development in environmental sciences. There are some incidental and scattered reports prepared by international organizations such as UNEP on some of the environmental problems facing Bahrain.

(e) Implementation of some environmental protection activities is part of the responsibilities of the Directorate of Public Health in the Ministry of Health. Activities include household water-quality control and monitoring, human settlements and habitat, public health and air quality.

(f) Bahrain does not as yet have a specialized implementing institution in charge of environmental protection on the national level. Gaps in environmental protection and control include the following areas:

- Control and management of oil sludges from the Bahrain oil refinery, car service stations and ballast water of oil tankers;

- Monitoring and control of air pollutants from industries such as asphalt plant, refinery and aluminium plant;

- Management and control of toxic material deposited into Gulf waters from the dry dock in which servicing and maintenance of ships are being carried out;

- Management of sewage water and its possible reuse after proper treatment, in forest tree-planting, pasture production, desertification programmes and/or recreational parks;

- Planning and implementation of training programmes to strengthen national capacity in manpower qualified to handle and operate environmental protection functions. This may be carried out as part of a regional training programme and/or through training followships abroad.

2.3.2 Egypt

(a) The policy-formulating body for environmental protection and conservation in Egypt is the Ministerial Committee for Environmental Affairs. Established in 1980 through a decree of the Prime Minister, the Committee is chaired by the first Deputy Prime Minister and has a membership of nine Ministers as follows: Education and Scientific Research, Manpower and Training, Industry and Mineral Resources, Tourism and Civil Aviation, Transport, Irrigation, Agriculture, Health, and Electricity and Housing.

The functions of the Committee as decreed are as follows:

- National policy formulation for environmental protection and conservation;

- Revision of existing legislation with a view to recommending amendments needed for environmental protection and conservation which precede implementation of national developmental plans in the economic, industrial, agricultural, social and urban fields;

- Co-ordination of environmental affairs on national, regional and international levels;

- Co-ordination and definitions of the functions of agencies which implement programmes in or related to environmental protection;

- Ensuring the implementation of the various laws dealing with environmental protection and conservation.

The Committee functions through a secretariat (scientific) chaired by a specialist in environmental sciences and has a membership of nine who are under-secretaries of the member ministries. The functions of the secretariat, which is attached to the Prime Minister's office, are as follows:

- Preparation of national policy for environmental studies and submission of such policy to the Committee for priority determination and adoption;

- Review of scientific matters referred to it by the Committee for further action and recommendation;

- Recommendation of legislative measures appropriate to Egypt, concerning needs in the field of environmental protection and conservation;

- Promotion of programmes and activities intended to increase public awareness of environmental issues.

The Committee has a budget of about 5 million Egyptian pounds to implement special activities not carried out by other implementing agencies. One of the most significant achievements of the Committee was the issuing of the Law of Natural Reserves under No. 102 for the year 1983. The law regulates the identification, establishment, management and protection of natural reserves throughout Egypt. Already 10 locations known for their rare and important wildlife, ecosystems and natural beauty have been identified in Sinai, the Eastern Desert and Red Sea shores and the Western Desert and north-western coastal areas.

(b) Planning and co-ordination. This function was entrusted to the Ministerial Committee discussed in paragraph (a) above.

(c) Public awareness, information and education concerned with environment are not the responsibility of an identified institution. However, many important and significant programmes, several societies and institutions are invovled in one or more of various aspects of these activities. The following is a summary of such activities:

(i) National programme of youth and environment problems. Launched in 1980 the programme has carried out many activites aimed at:

- Sensitizing the care of youth in each of the Governorates of Egypt and exploring the role of youth in environmental education of the public and protection of the environment; and

- Development of the role of youth and promotion of their involvement. The programme was carried out by a steering committee representing several universities and its details are shown in annex II. The inclusion of such an activity in this study is in recognition of an innovative approach to increase the awareness and participation of an important sector of the public in environmental protection and conservation.

(ii) MAP periodical bulletin: This publication is intended to promote national and regional concern for environmental affairs and is published by the Egyptian National Committee for Man and Biosphere in co-operation with the National Commission for UNESCO.

(iii) There are about 19 scientific Egyptian societies and 10 Governmental Councils and Committees that are involved in activities related to environmental matters and that play a role in increasing public awareness and provide information and materials for educational programmes. A list of these societies, councils and committees is presented in annex III.

(iv) Environment and ecology are taught as separate subjects in the curricula of the faculties of sciences and agriculture in Egyptian universities.

(d) Manpower development and research. Although there is no single programme devoted specifically to training and qualifying manpower in environmental protection and conservation in all higher educational institutions of Egypt, Egypt does have a wealth of manpower trained in scientific, economic, health and technological fields related to environment. The following programmes can be cited as a base for consolidated activities in environmental protection:

- High Institute of Public Health, Alexandria University: M.Sc., Dr. public health, and diploma in sanitary engineering, environmental sciences and environmental health;

- Graduate Research Institute, Alexandria University: M.Sc., and Ph.D. programmes for environmental studies;

- Graduate Institute of Environmental Research, Ain Shams University;

- Department of Environmental Engineering (Zakaziek University);

- Research programmes of the National Research Centre in collaboration with national universities (M.Sc. and Ph.D., in water, air and microbial pollution).

Such manpower constitutes a good base to select from for further training in environmental protection functions. Such training activities have been carried out both in Egypt and abroad. If Egypt decides to consolidate its present programmes of environmental protection into one institution, further strengthening of manpower in some management areas of environmental protection will be needed. As for research, the Environmental Research Council which was established in 1971 is responsible for planning, co-ordination, programming and financ-

ing of research in Egypt. Implementation of research is carried out in Egyptian universities and the National Research Council. The Academy of Scientific Research and Technology has approved the environmental research plan on the national level and it is summarized in annex IV as an illustration of researchable topics in other countries.

(e) Implementation of environmental protection is fragmented among several ministries and other institutions. Hence there is no department that is specialized in environmental protection on the national level. Some of the environmental protection functions are part of departments in the Ministries of:

- Agriculture Research Centre: Division of wildlife protection: some monitoring of soil and water deterioration;

- Labour: National Centre for Industrial Safety Centre;

- Health: Occupational Health Division;

- Environmental Research Institute;

- Ministry of Irrigation: monitoring of water quality in the Nile.

In addition the National Organization for Drinking Water and Drainage (sewage) is responsible for monitoring and control of water quality.

In 1981, the Committee decided to establish an Environmental Protection Office in each of the Governorates of Egypt. Each head of these offices reports directly to the Governor, who in turn communicates matters related to environment to the Committee. The functions of these offices are:

- To follow-up the recommendation of the Committee;

- To follow-up implementation of legislation related to environmental protection;

- To report to the Committee on environmental problems, constraints and possible solutions;

- To suggest amendment of existing legislation;

- To participate in the implementation of national policy for environmental protection and conservation.

(f) Although Egypt seems to have extensive structures for environmental functions, there are gaps in the institutional organization of environmental protection.

First, Egypt does not have as yet a law concerned with environmental protection. The national plan for development of Egypt calls for reviewing separate laws and acts with a view to consolidating them in one comprehensive law for environmental protection and conservation in the broad sense.

Secondly, fragmentation of environmental protection units leaves much to be desired in the strengthening and consolidating of functions such as: systematic monitoring of soil, water and air; monitoring and abatement of industrial pollution; land use planning; monitoring and control of pesticide residues in food, soil and water; environmental impact of developmental projects; noise control; manpower training in environmental protection and management and last but not least occupational health hazards and management of and protection therefrom.

2.3.3 Iraq

(a) Policy formulation: the higher body responsible for formulating policies concerned with environmental protection in Iraq is the Environment Protection Council (EPC). Established in 1978 through decree No. 750 of 1978 of the Revolutionary Command Council, EPC is chaired by the Minister of Health and has 15 members representing the following Ministries and organizations: Health, Industry and Minerals, Housing and Construction, Planning, Oil, Agriculture and Agrarian Reform, Interior, Labour and Social Affairs, Higher Education and Scientific Research, Defence, Irrigation and Transport and Communication. Three other members represent the Atomic Energy Organization, the Baghdad Governorate and the Scientific Research Council.

EPC has been functioning as a co-ordination and recommendation body on environmental affairs. It was only in 1984 that a law was passed to give EPC legal status, to organize its functions and responsibilities and to define its authorities.

The work of EPC in the past six years has concentrated on two main functions:

(1) To review the current state of the environment in the country and to recommend appropriate solutions to existing problems;

(2) To look into the environmental impact of economic and industrial developmental projects in Iraq and recommend measures, to be incorporated in the implementation plans of each project, aimed at control and management of negative effects of such projects on environment. Several efforts have been made to strengthen and define the work of EPC, especially through the Planning Board of the country. Such efforts led to the approval of the following measures by the Revolutionary Command Council:

- The designation of the Ministry of Health as the technical implementing arm of EPC and the stipulation that functions of EPC be restricted to protection of environment from pollution;

- The stipulation that decisions of EPC concerning environmental protection be binding on concerned institutions once reviewed by the Ministry of Planning and approved by the Planning Board;

- The stipulation that the Ministry of Health in co-operation with other authorities concerned take the responsibility to prepare legislative acts for protection of the environment.

(b) Co-ordination and planning: although the work of EPC was supposed to recommend planning and co-ordination measures related to environmental protection, these functions were not spelled out clearly in its responsibilities.

The membership of EPC is from the Director General ranks of various institutions. Such membership did not prove to be effective in carrying out planning and co-ordination functions in similar situations in other countries. Although overall planning and co-ordination of national social and economic developmental plans are the responsibility of the Ministry of Planning, environmental protection strategies, policies and organizational measures were not clearly apparent in such plans.

(c) Public awareness, information and education: the following should be noted:

(i) There are no clearly defined programmes that are concerned with environmental public awareness. However, environmental matters are handled by public information media in an informal arrangement. The Directorate of Human Environment, recently reorganized (see paragraph (e) below), does have an environmental awareness division focussing mainly on enhancing awareness of public health.

(ii) Public awareness and environmental information are two objectives among several of the Iraqi Society for Environment Protection and Improvement. Established in 1978 and later regulated through law No. 55 for 1981 which organizes affairs of societies, the Soceity publishes a quarterly scientific journal entitled Environment and Development.

(iii) There are no special programmes in Iraq for training in environmental protection. Some courses in ecology, pollution, range management and other subjects related to environment are part of cirricula leading to B.Sc. and M. Sc. degrees in agriculture, pure sciences and engineering. Environment and its protection is not taught as a separate subject at schools

but rather integrated in other related ones. Therefore the need exists for an interdisciplinary programme dealing with all aspects of environmental protection.

(d) Manpower development and research: There are no formal programmes of training in environment and its protection in any of the educational institutions of Iraq. However, manpower trained in fields related to environment protection is currently available from the public health institutes of the Ministry of Health and the training institute of the General Organization of Water and Sewage. The capabilities of those human resources could be further enhanced by specialized training in environmental fields both inside and outside Iraq. There exists a need to train manpower in environmental standards determination, environmental integrated management of urban centres, and some apsects of water, air and pesticide monitoring and analysis for environmental management objectives.

Research in environmental protection areas is limited to staff initiative since there is no national plan for environmental research similar to what is being developed in the agricultural, biological energy and water sectors. Research connected with environmental problems is being carried out by the Agricultural and Water Research Centre and the Biological Research Centre, both working under the Scientific Research Council. In additon, some staff members in the colleges of agriculture, science, medicine and engineering in Iraqi universities are carrying out research on environmental problems. Topics being researched include: pollution of the Shatt Al Arab waters, pollution of the Gulf waters of Iraq, industrial pollutants in the Tigris river, air pollutants, methods for treating sewage water, sand dune fixation, soil salinity problems and utilization of organic and cellulose wastes.

(e) Implementation structures and functions: the following should be noted:

(i) Environmental protection does not appear in the name of any institution which implements functions related to the environment;

(ii) The newly organized directorate in the Ministry of Health, under the name General Directorate of Preventive Medicine and Environment Services, has the mandate to implement several functions related to environmental protection and management. The Directorate was reorganized recently by merging the Directorate of Human Environment with that of Preventive Medicine; both were under the Ministry of Health. The new Directorate has over 150 employees working in the following units: environmental engineering, laboratories and research, environmental awareness, and statistics. Other functions planned by the Directorate did not develop into fully opera-

tional units and include planning and follow-up, legal matters and regional and international relations.

(iii) Other functions related to environmental protection and management are part of the responsibilities of institutions distributed over several ministries and they include:

- Rangeland management as part of the responsibilities of the Range Directorate in the Ministry of Agriculture and Agrarian Reform;

- Monitoring of soil and water quality (but not systematically) as part of the Agricultural Research and Water Centre, Scientific Research Council;

- Sand-dune control and management as part of the responsibilities of the Ministries of Irrigation and Agriculture and Agrarian Reform.

(f) Gaps in the institutional organization of environmental protection include the following: industrial pollution monitoring and control, air pollution monitoring and control, noise management, manpower training in environmental protection, systematic monitoring of soil and water quality, wildlife protection, desertification management and control, and monitoring and management of pesticide residues.

In addition, the standards and special environmental protection measures to be incorporated in industrial, public services, and other developmental projects need to be defined both in terms of what they are and who is responsible to ensure implementation on a national level.

2.3.4 Jordan

(a) Policy formulation. There is no national body which is responsible for formulation of policies of environmental protection and conservation in Jordan. However, there are a few separate articles found in laws and bylaws, issued by the Government, which regulate some aspects of environmental protection and may be considered as policy decisions. These will be discussed under the respective paragraphs. In addition the Higher Health Council chaired by the Minister of Health does recommend to the Council of Ministers policy matters concerned with environmental protection and management issues but only those related to public health.

(b) Planning and co-ordination. Again these functions concerned with environmental protection are not assigned to any institution. Several attempts have been made in the past to co-ordinate the work of concerned institutions in environmental matters through non-regular meetings of the National Committee for Environment. Established in 1980 by a decision of the Coun-

cil of Minsiters, the Committee is chaired by the Minister of Municipal and Rural Affairs and Environment and has members representing the Ministries of Municipality and Rural Affairs and Environment, Health, Education, Agriculture, Tourism and Archeology. Other members are the President of the Royal Society for Conservation of Nature, the Director General of the Natural Resource Authority and the President of Yarmouk University. The honorary president of the Committee is the Queen. The Committee acts in an advisory capacity but represents a forum for concerned officials to discuss environmental issues and recommend for the consideration of the Government measures related to environmental protection and conservation.

(c) Public awareness, information and education: the following should be noted:

(i) One of the objectives of the Royal Society for Conservation of Nature is to address public awareness. The Society is a non-governmental organization which is active in serveral activities of environmental conservation and publishes on a regular basis a popular magazine called Reem. In addition, the Society organizes programmes aimed at promoting public awareness of environmental issues and emerging problems associated with development in Jordan.

(ii) Environmental information and public awareness is also addressed by the Environment Department in the Ministry of Municipality and Rural Affairs and Environment but not on a formal basis.

(iii) Environment is taught as a subject in both the University of Jordan and Yarmouk and is integrated in school curricula.

(d) Manpower development and research. There is no formal programme for training manpower in environment and its protection and management in any of the educational institutions in Jordan. However, graduates in the fields of science, agriculture and public health from both the Universities of Jordan and Yarmouk make up a good starting point for further training in environment protection fields.

Research in environmental areas is limited to areas of occupational health hazards of labour in some Jordanian industries (batteries industries), water pollutants and their sources in King Talal Dam and the Aqaba Gulf, and limited scale and fragmented monitoring of rangeland, soil and water resources. The institutions involved in research are the University of Jordan (Faculty of Science and Water Research Centre) the Royal Scientific Society, the Natural Resource Authority and the Ministry of Agriculture (Department of Forestry and Range).

(e) Implementing institutions of environmental protection:

(i) The newly established Department of Environment in the Ministry of Municipality and Rural Affairs and Environment is in the process of organizing its functions, manpower development and facilities. The work of the Department is concentrated on studying the environmental impact aspects of old and newly established industrial projects and other public service facilities.

The implementation of recommendations made by the Department are a prerequisite to issuing licences for new firms. There are no set criteria or standards that are approved and legalized as yet for recommendations submitted to authorities by the Department. The staff of the Department is limited to several people. The Department, in co-operation with other agencies, has proposed a special law for environment and its protection and conservation. The proposed law calls for the establishment of a higher committee for environment and for expanding the regulatory, monitoring and management functions of the Department to areas that include wildlife, air pollution and its control, water pollution and its control, natural reserve and national parks management, marine life protection, land and natural resources protection and management.

(ii) The Department of Environmental Health in the Ministry of Health has been operating for over 20 years. Its functions are concentrated in three major divisions:

- Environmental monitoring, concentrating on monitoring and control of drinking water pollutants, waste disposal, insect and rodent control and in recent years air pollution;

- Public health engineering, concentrating on sewage engineering;

- Occupational health.

The Department has a staff of over 40 and is functioning satisfactorily in environmental monitoring areas related to water.

(iii) The Royal Society for Conservation of Nature. Although the Soceity is a non-governmental organization established under the law regulating societies under the Ministry of Youth and Culture, the Society is entrusted with the implementation of those articles in the agricultural law No. 20 for 1973 that pertain to regulatory functions of hunting and protection of birds and wild animals in Jordan. The Society is also entrusted, through decisions of the Council of Ministers, to manage the Natural Reserves of Shoumari and Azraq Oasis. The Society has a staff of inspectors, cars and communication facil-

ities which enable it to implement its functions in a relatively effective manner.

(iv) Monitoring and management of soil, forest and rangeland resources are by law the responsibility of the Ministry of Agriculture. It is only in forestry that the Ministry is implementing relatively effective measures of control and management. In cases of soil and range land conservation, there is much to be desired in the effective implementation of relevant legislation.

(f) Gaps and constraints: Perhaps the most apparent constraint in environmental protection is the organizational fragmentation both in structure and functions. Jordan has been active in issuing acts pertaining in part to environmental protection and conservation. The consolidation and strengthening of present legislative acts and functional and structural units leave a few gaps which include: policy formulation, a planning and co-ordinating body, pesticide monitoring, standards and criteria for air, water and soil pollution, standards and criteria for environmental impact assessment of economic and industrial developmental projects and last but not least training of manpower in environmental management as well as some environmental monitoring and analysis.

2.3.5 Kuwait

Kuwait is perhaps the most organized country in matters related to environmental protection. Although there is no study on the reasons why, the following remarks may shed some light on the subject:

- Kuwaiti officials and the general populace are highly sensitized to environmental pollution problems.

- Kuwait is a city State: its people are living in one big urban centre and environmental problems are hence quite apparent and visible to every one.

- Kuwait is a rich country and was able to recognize the importance of environmental protection for the general welfare of its people and sound management of its resources. This protection was given priority and was translated into legislative acts as well as the implementation of environmental protection functions.

- Although the history of environmental protection is quite recent in Kuwait, it does provide other countries in the region facing similar problems with a model of experience to be studied and benefited from.

(a) Policy formulation. The Council for Environmental Protection (CEP) is the body responsible for the formulation of

policy. The functions of CEP are defined in law No. 62 for the year 1980 and include the formulation of "general policy for the protection of environment, including appropriate scientific and health standards for residential areas, industrial and urban development and exploitation of natural resources in a way that insures the safety of all premises and working population and the protection of the environment in general". Formulated policies are passed to the Council of Ministers for final approval. CEP is also responsible for the preparation of bills, regulations and orders for the protection of the environment and for passing them on to the authorities concerned for approval.

CEP is chaired by the Minister of Public Health and has 11 members representing 8 Ministries as follows: Public Works, Commerce and Industry, Planning, Interior, Public Health, Electricity and Water, Communications and Oil. The three other members represent the Municipality of Kuwait, the Directorate General of the Shuaiba Industrial Area and the Kuwait Institute for Scientific Research. CEP is empowered by law to add new members as the need arises.

The implementing arm of CEP is the Department of Environmental Protection which will be discussed under implementation.

Other functions and modes of operation of CEP that are well defined in the Law for Protection of the Environment will be discussed in the following paragraphs. The law is presented in annex V for its significance in legislative and organizational matters related to environmental protection.

(b) Planning and co-ordination. Short and long-term planning of programmes pertaining to environmental protection as well as co-ordination of activities of different institutions concerned with environment and its protection are two additional functions that are well defined and are part of CEP responsibilities by law. Other planning and co-ordinating functions of CEP include:

- Participation in formulating research policy in the field of environmental protection;

- Studying and recommending to concerned authorities the ratification of international agreements and conventions related to environmental protection;

- Advising the Government on relations between Kuwait and other regional and international organizations concerned with protection of environment;

- Formulating manpower development plans needed for implementation of environmental protection functions;

- Last but not least setting the framework of environmental education and public awareness programmes.

(c) Public awareness, information and education:

(i) Preparation of information and public education programmes are the responsibility of the Training and Environment Information Section of the Central Department of Environment Protection. In Addition, the Department publishes an annual report on its activities which high-lights environmental problems in Kuwait and represents an excellent information source for the publication of the Kuwait Report in the State of Environment published by CEP.

(ii) The Environment Protection Society in Kuwait participates in the information field of environmental protection and publishes a series of cultural publications dealing with environmental issues under the title "Environmental Issues".

(iii) Environmental issues receive good coverage in public communications media.

(iv) Environment is taught as a subject in the College of Science at the University of Kuwait and is integrated in school curricula.

(d) Manpower development and research. There are no formal training programmes in environmental protection at the University of Kuwait, which is the higher educational institution. Graduates of science from the University and from abroad are in high demand in government offices and other private sector institutions. Hence Kuwait hires a large number who are non-Kuwaiti citizens to man the environmental protection department. There is need further to train both Kuwaiti and non-Kuwaiti manpower in fields which include environmental management in analysis of water and air pollutants and in technologies of oil and water-waste treatment.

As for research, the Kuwait Institute for Scientific Research has been carrying out a number of research programmes both from its own core budget and under contract with CEP, the Directorate General of the Shuaiba Industrial Area, the Municipality of Kuwait and the Ministry of Public Works.

Research topics include:

- Baseline studeis of oil and non-oil pollutants in the marine environment of Kuwait;

- Water quality control at the Kuwait Petroleum Company;

- Preliminary assessment of environmental impact of development projects in and around Shuaibia Bay;

- Study of catch deposits in the Kuwait city suburbs;

- Simulation of oil spill dynamics and risk analysis for the Kuwait coast;

- Range management and methods for combating desertification;

The Department of Environment Protection does carry out some surveys and monitoring research, especially on air pollutants, water pollutants and occupational health hazards and their causes. The research programme carried out in Kuwait is significant in producing data and a knowledge base for determining standards of environmental quality.

(e) Implementing institution:

(i) The central and consolidated institution for implementing environmental protection functions is the Department of Environment Protection. Established in 1980 by ministerial order of the CEP chairman, the Department has a Director who reports directly to the Minister of Health (chairman of CEP). Law No. 62 for 1980 regarding protection of the environment empowers the chairman of CEP to establish implementing organs to carry out all functions seen by CEP as necessary for the protection of environment. The Department is fully operational in the majority of its functions and has about 160 staff of whom 90 are technical. The structural organization of the Department is shown in figure I. Functions of the department are well spelled out in Ministerial Order No. 389 for 1980, which is annexed to this study in annex VI for its significance as an example of an institution actually operating in environmental protection implementation.

Functions implemented by various structural units of the Department include:

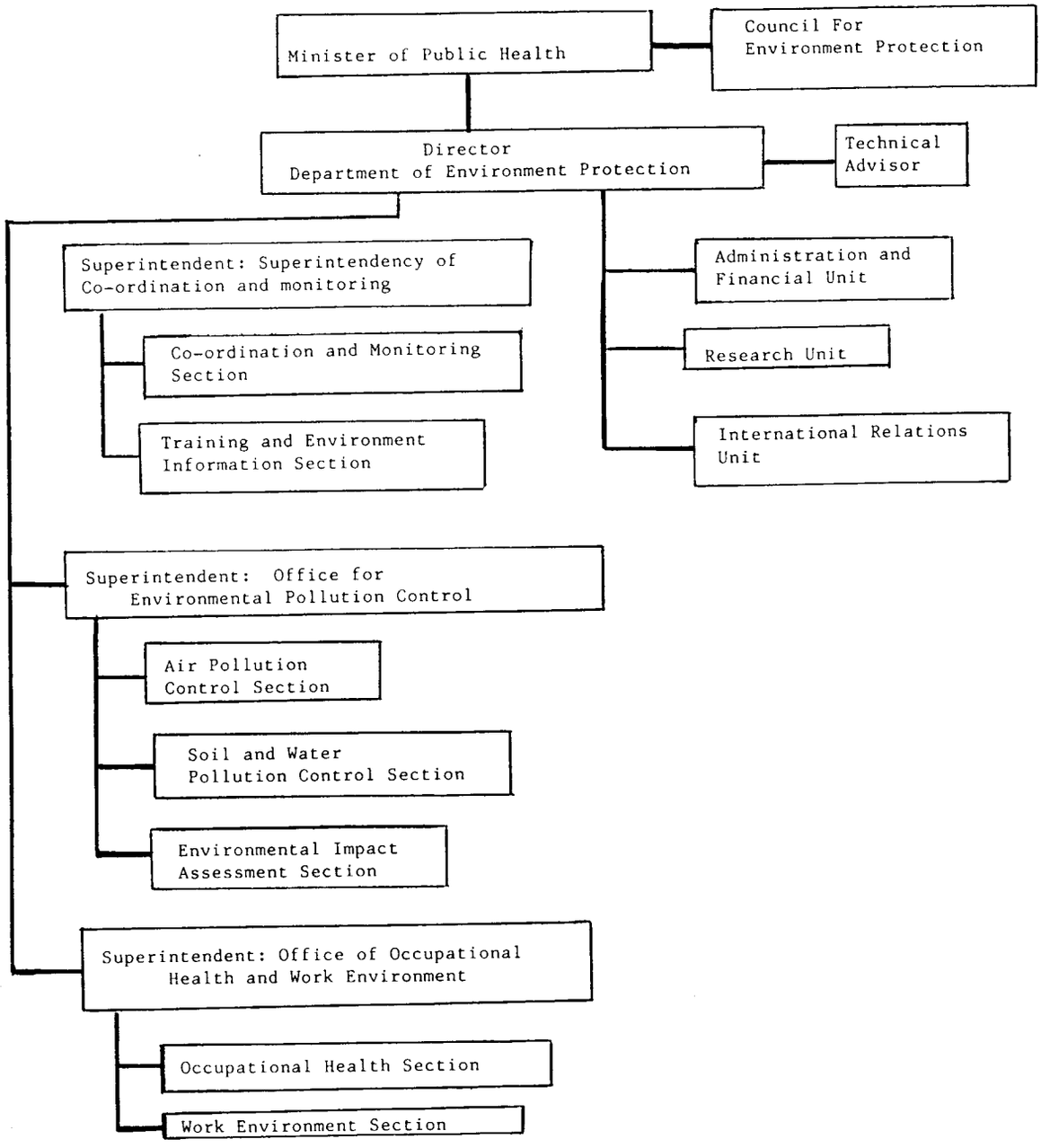
- Monitoring of air and water quality in all Kuwait;

- Monitoring occupational health hazards;

- Monitoring the environment of workers;

- Assessment of environmental impact of developmental projects, urban centres, small industries and public service facilities;

Figure I. Structural organization of the Department of Environment Protection in Kuwait



- Acting as focal point at the national, regional and international levels in the overall field of environmental protection;

- Acting on behalf of the State to bring to account violators of laws, regulations and orders pertaining to environmental protection in particular: the Department acts as the agency which ensures labour compensation, according to effective laws, when workers are subjected to occupational hazards;

- Monitoring pollutants in all the environment of Kuwait especially those from industrial wastes, urban wastes and oil;

- Contracting researchable problems to specialized research institutions.

(ii) There are two functions that are related to environmental protection and management which do not come under the Department of Environment Protection, namly:

- Control of pollution in the Gulf, including control of oil spillage violation in the waters of Kuwit. This function is implemented by the Ministry of Communication.

- Desertification control and drinking water pollution control and control and treatment of liquid wastes are handled by the Ministry of Public works and the Municipality of Kuwait.

(f) Gaps and constraints: Kuwait is now at the stage of dealing with constraints facing implementation of environmental protection. The organizational structures and functions are well thought out; however, since the implementing institution is still new, some of the functions are not implemented as yet. These includes:

- Preparation of standards, specifications and conditions needed to maintain a clean and balanced environment. Such standards will be the base for passing laws, regulations and orders for enforcement against violators.

- Soil monitoring and analysis which happens to be not so important in Kuwait.

- Training of personnel both inside and outside Kuwait to strengthen the capacity of the Department in implementing its other functions.

- Co-ordination vehicles with other concerned agencies are still weak.

Constraints faced by the Department stem from previous gaps. The scarcity of Kuwaiti manpower trained in environmental protection is perhaps the most perceived constraint. The second constraint is the difficult of dealing with small enterprises and public service units, such as car service stations and small industries, in making them comply with required conditions and measures for a cleaner environment.

2.3.6 Lebanon

Because of prevailing conditions in Lebanon, it is difficult to assess the state and performance of Lebanon, it is institutional structures in environmental protection. All efforts to obtain information on current development have been unsuccessful. Hence, no attempt will be made here to cover Lebanon.

2.3.7 Oman

(a) Policy-formulating body. The Council for Environment conservation and Prevention of Pollution is a high-level body presided over by the head of State, the Sultan, and is composed of six Ministers as follows: the Minister of Communication as vice-president, the Minister of Electricity and Water as assistant to the vice-president, and four members who are Ministry of: Commerce and Industry, Land and Municipalities Affairs, Health and Interior. Established through Sultan's Decree No. 68 for the year 1979, the Council is empowered with wide responsibilities to conserve the environment and control pollution in land and marine waters of the Sultanate of Oman. Although the responsibilities do no specify policy formulation for environmental conservation and protection, they contain a wide range of powers which imply that the Council may perform such a function. In 1982, the Law No. 10 for the year 1982, the Environment Conservation and Prevention of Pollution Law, was decreed to provide the legislative measures needed to organize and implement environmental conservation and pollution control in Oman.

The Council, assisted by the technical secretariat, is in the process of establishing the vehicles and structural units for the implementation of provisions.

(b) Planning and co-ordination. These two functions are assigned to the Council. Since there is no special environmental protection institution in operation as yet, and co-ordination activities of the Council are restricted to those institutions presently involved in environment in one way or another. These institutions will be discussed under the following paragraph on implementation.

(c) Public awareness, information and education. Again, there is no identified institution which is responsible for

these functions in Oman. The planned implementing institutions may take up such functions.

(d) Manpower development and research. Among the responsibilities of the Council stipulated in the law is the taking of measures needed to ensure the following:

(i) Development and co-ordination of national programmes of research in the field of environmental pollution;

(ii) Development of manpower and facilities needed to implement measures and programmes in the various aspects of environmental protection and conservation and in particular in the emergency cases of pollution incidents. Present activities implemented in these two areas are negligiable and are restricted to some research programmes in range management carried out by the Ministry of Agricutlure and Fisheries.

(e) Implementation. Oman is in the process of organizing its implementing institutions in the field of environmental conservation and prevention of pollution. Oman has legislated four laws and one sultan's decree all directly related to environmental conservation and protection. These are:

- Sultan's decree No. 34 for the year 1974 issuing the law under the title "Monitoring and control of marine pollution".

- Sultan's decree No. 26 for the year 1979 issuing the law under the title "National parks and natural reserves".

- Sultan's decree No. 68 for the year 1979 calling for the establishment of the Council for Environment Conservation and Prevention of Pollution.

- Sultan's decree No. 53 for the year 1981 under the title "Marine fishing and conservation of marine life".

- And finally Sultan's decree No 10 for the year 1982 issuing a law under the title "Environment Conservation and Prevention of Pollution".

(i) Sultan's decree for the establishment of the Council gives the authority to the Council to establish a technical secretariat to assist it in fulfilling its objectives and function. The secretariat has been formed and is in operation.

(ii) Law No. 10 for the year 1982 gives the Council additional authority to carry out the following:

- Formulate regulations and principles to implement the law of environmental conservation and prevention of pollution;

- Establish, administer and operate a central laboratory for environmental studies;

- Establish and operate an environmental meteorological network;

- Act as the Omani focal point in the implementation of Oman's environmental obligations in regional and international agreements which Oman is party to, as well as in the implementation of Oman's obligations in regional and international organizations which Oman is a member of.

The law also gives the authority to the council to take measures for the organization and implementation of the following:

- Issuing licences for the establishment of new projects or public facilities which constitute a source of pollution. This is the responsibility of the vice-president of the Council.

- The technical secretariat is responsible for the preparation and submission to the Council of: environmental standards appropriate to Omani conditions and specifications concerning pollution protection required for establishment of public facilities and industries which constitute sources of pollution; the type and number and location of natural reserves which should be established in Oman; the type and location of historical and national heritage protected places; and all other regulations and orders needed for the implementation of the law.

- The technical secretariat should have a staff of experts and permanently employed environment officers to be appointed the by vice-president of the Council and to be responsible for monitoring and inspecting all sources of pollution as well as the protection of wildlife, marine life, water resources, natural reserves and places of national heritage.

- Last but not least, the Council and its secretariat should form committees for co-ordinating its work with other Omani institutions concerned with environment. Furthermore, law No. 10 for 1982 is considered complementary to all other previously issued laws concerning environmental conservation and prevention of pollution.

(f) Gaps, constraints and remarks: Since Oman is in the initial stages of organizing and implementing its environmental protection services, gaps and constraints cannot be determined now. The legal aspects of such organization indicate a high degree of commitment on the part of the Government of Oman to deal with the environmental protection problem. However, the

structural aspects of proposed functions need to be better defined and developed in order that implementation becomes effective. Perhaps the biggest constraint facing Oman is lack of availability of trained manpower. Another aspect would be the consolidation of functions organized under different laws into one central organization or department of environmental protection.

2.3.8 Qatar

(a) Policy formulation. The Permanent Committee for Environment protection is the designated body in Qatar which has been empowered by law to formulate policies related to environmental protection. Established in 1981 through Law No. 4 for 1981, the Committee was given autonomous status both financially and administratively. The Committee reports to the Prime Minister and is chaired by the Minister of Health. The Committee has 16 members, 12 representing Ministries which are namely: Industry, Agriculture, Interior, Finance and Oil, Transport and Communication, Public Works, Municipality Affairs, Electricity and Water, Education, Trade and Economy and Justice. All representatives are of Director-General status. The other four members represent the Qatari Oil Organization, the University of Qatar, the Technical Centre for Industrial Development and the Chamber of Trade.

In addition to policy formulation the Committee has several functions, which include formulation of legislative acts and are passed on to the concerned State authorities for approval.

At present, the Committee is organizing and implementing clauses of Law No. 4 mentioned above and has a technical secretariat operating from an office temporarly located in the Ministry of Health.

(b) Planning and co-ordination. These two functions have both been assigned to the Committee. Planning includes manpower development, legislative acts and educational programmes needed for proper implementation of environmental protection. The co-ordination function includes monitoring and evaluation of activities of institutions working in environment and its protection.

In addition to the above aspects of the co-ordination funciton, the Committee is designated by law to represent Qatar in regional and international conferences as well as in dealing with regional and international organizations in matters of environmental protection. In this respect, the Committee serves as a national focal point as well as playing a co-ordination role between national institutions on the one hand and regional and international organizations on the other.

(c) Public awareness, information and education. Although Law No. 4 lists these three functions under the responsibility of the Committee, vehicles to implement such functions were not spelled out in it. In its search for implementing articles of the law, the Committee, acting through its secretariat, is in the process of finding ways and means to implement such functions.

(d) Manpower developemnt and research. Again Law No. 4 stipulates that the Committee will formulate a plan to develop manpower to implement environmental protection functions. However, the law does not clarify the definition of vehicles for implementation of manpower development and where such manpower will work. This issue will be elaborated upon under implementation. Formal programmes of manpower training in environmental protection are not available in the curricula of Qatar University. Training needs may be met through regional raining programmes or in institutions abroad. There is no designated national research plan in environmental protection. However, several institutions implement a number of research projects related to the field. The institutions and the programmes carried out by each of them are:

- Technical Centre for Industrial Development: monitoring of air and water quality and pollution;

- University of Qatar: some aspects of marine water pollution, basic surveys on founa and flora and studies on underground water feeding;

- Directorate of Agricultural and Water Research, Ministry of Industry and Agriculture: underground water recharge sources and water balance, soil surveys, soil salinity, and sand dune movement.

- Directorate of Animal Husbandry, Ministry of Industry and Agriculture: wildlife management and range management.

(e) Implementation of environmental protection functions. There is no institution or department in charge of implementing environmental protection functions: Some aspects of environmental protection have developed as marginal functions of other departments in the State. One of the most important steps needed is the consolidation of environmental protection functions in one institution. This aspect of institution-building was not addressed specifically by Law No. 4 for 1981. The Technical Secretariat of the Committee is supposed to resolve this problem.

Implementation of some aspects of environmental protection is part of the functions of the following institutions:

- Technical Centre for Industrial Development: air pollution, industrial pollution and water pollution;

- Ministry of Health: public health and some aspects of occupational hazards;

- Ministry of Municipality Affairs: some aspects of environmental impact of developmental projects and public facilities;

- Ministry of Industry and Agriculture: Monitoring of soil and underground water quality and management, range and wildlife management.

The Technical Secretariat of the Committee is empowered by law to address vehicles (means) and measures concerning the following:

- Conditions and requirements to be met to ensure environmental safety from industrial, oil, and other public service projects that constitute sources of pollution;

- Preparation of environmental standards to ensure quality and safety of air and water from pollutants;

- Formulation of plans to monitor and control emergency incidents that have a negative impact on environment;

- The above are in addition to the other functions discussed in previous paragraphs which include manpower, research, information and public awareness.

(f) Gaps, constraints and remarks:

(i) Qatar is a small country; it does have known environmental problems resulting from industrial liquid and solid wastes, oil sludges, underground water overexploitation and overcultivation of limited land resources.

(ii) The legislative measures taken thus a constitute a good starting point for organizing environmental protection services. However, the consolidation of the needed environmental protection functions under one institution is the optimal course of action.

(iii) Among the few constraints facing the establishment of an effective environmental protection institution is manpower trained in the fields of environmental monitoring, environmental protection measures for marine coastal life, management of liquid and solid pollutants and

rational management of scarce land and underground water resources.

2.3.9 Saudi Arabia

(a) Policy formulation. There is no designated body responsible for policy formulation of environmental protection in Saudi Arabia. However, some of the institutions and committees concerned with environmental problems may suggest policy decisions to be submitted to the Council of Ministers for approval.

(b) Planning and co-ordination. The Environmental Protection Co-ordination Committee is the highest-level body concerned with environmental protection in Saudi Arabia. Established in A.D. 1981 (A.H. 1401) through Royal Decree No. 7/M/8903, the Committee is chaired by the deputy of the Prime Minister, who is the Minister of Defence, and has 10 members as follows:

- Eight members of under-secretary or assistant under-secretary level representing the Ministries of: Interior, Planning, Agriculture and Water, Communications, Industry, Oil and Mineral Resources, Health and Municipality and Rural Affairs;

- Two other members representing the National Centre of Science and Technology and the Meteorology and Environmental Protection Administration (MEPA). The President of MEPA is the Secretary General of the Committee.

The functions of the Committee include the following:

- Co-ordinating environmental activities of various institutions in Saudi Arabia;

- Reviewing and endorsing regulations of environmental protection proposed by either MEPA or other agencies and forwarding them to the Council of Ministers for approval or ratification;

- Reviewing and endorsing MEPA plans and programmes.

The same Royal Decree referred to above approved the establishment of MEPA as the central institution responsible for environmental protection in Saudi Arabia. MEPA and its activities will be discussed under paragraph (e) below on implementing institutions.

One of the achievements of MEPA in the field of legislative principles and concepts is the preparation of a document outlining the basic principles of environmental conservation and protection in Islamic Shariah. The document was prepared in co-operation with the legal committee of IUCN (International

Union for Conservation of Nature) and the Faculty of Liberal Arts at King Abdul Aziz University. The document is considered to form the basis for a general framework and major principles of future regulations of environmental conservation and protection in Saudi Arabia.

(c) Public awareness, information and education. Materials and books published by MEPA constitute the major input in the general field of environmental information and public awareness in Saudi Arabia. MEPA puts out an annual report summarizing its activities and findings on the state of the environment in the Kingdom and contracts with other institutions for the preparation and publication of basic information documents and reference materials. These include the state of environment, fauna and flora of Saudi Arabia. However, neither MEPA nor any other institution in the Kingdom is designated to carry out the function of programme preparation and implementation of environmental information and public awareness. Environment is taught as a subject in the curricula of the colleges of Agriculture and Science in the Universities of Saudi Arabia and is taught as a material integrated with science in schools.

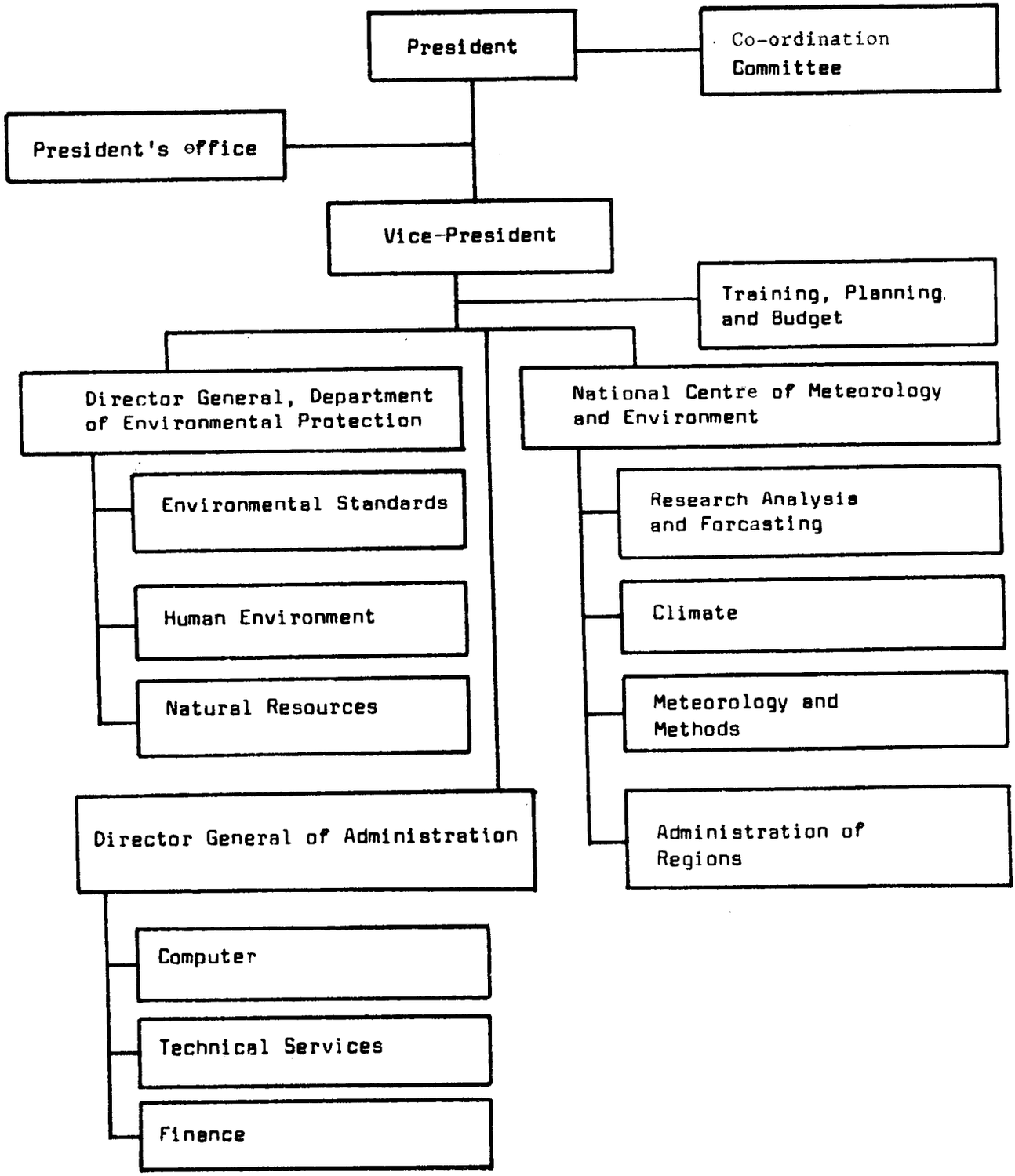
(d) Manpower development and research. The College of Meteorolgoy and Environmental Sciences at King Abdul Aziz University in Jedda offers a programme that leads to a B.Sc. degree. Graduates of this College in addition to graduates of the colleges of science, marine science, and agriculture in Saudi universities constitute a good source from which to draw manpower for environmental protection activities. Further training in specialized subjects is needed and MEPA already has seven scholarship students studying abroad to qualify in subjects such as management of natural resources, impact of marine pollution, terrestrial ecology and water pollution. Another avenue for developing manpower is local and regional special training programmes in environmental protection.

Research on environmental protection has been carried out by various Saudi institutions which include:

- The National Centre for Science and Technology which supports research on sand dune control, oil pollution management, and development of environmental standards for oil industry. Implementing agencies include the University of Petroleum and Minerals in Dammam and MEPA;

- MEPA, which is carrying out surveys on air pollution, on marine water pollutants in the Gulf in addition to marine life surveys in the Red Sea and basic surveys of fauna and location of important plant ecosystems in the Kingdom with the objective of establishing natural reserves;

Figure II Meteorology and Environmental Protection Administration (MEPA) of Saudi Arabia (Structural organization)



- The Marine Science College at King Abdul Aziz University, which is implementing basic studies on marine life ecology in the Red Sea;

- The Agricultural Research Centres in the Ministry of Agriculture and Water are implementing fragmented studies on monitoring of water and soil salinity, management of range vegetation and sand dune fixation.

(e) Implementing institution:

(i) Meteorology and Environmental Protection Administration (MEPA): In 1981, environmental protection was added as an integral function of the then operational Directorate of Meteorology in the Ministry of Defence. MEPA, as it is named now, is considered the central focal point for implementing several functions of environmental protection in Saudi Arabia. The structural organization of MEPA is shown in figure II. MEPA has an Environmental Protection Directorate which is in the process of building its capacity to deal with functions assigned to it. Manned by a core team of competent and enthusiastic Saudi scientists and with the help of an expatriate group of experts from the United States, MEPA has accomplished several tasks and has participated actively in setting up a national network of environmental protection units. The tasks and functions assigned to MEPA include:

- Preparation of environmental standards: standards for air quality, water quality and pollutant limits were prepared and measures have been in effect since 1982.

- Preparation of standards and measures for liquid and solid wastes and their disposal, poisonous and dangerous material disposal, noise control, and standards of water used in households, industry and agriculture. This task is under way.

- Preparation of a national report on the state of the environment in Saudi Arabia. This task was carried out in co-operation with a team from Stanford University and will be finalized within the coming few months.

- MEPA is implementing a number of tasks which include: air monitoring, water quality monitoring, ensuring that industries and public facilities are operating within the limits of approved environmental standards, co-ordination with other institutions in other environmental conservation and protection

measures, and preparation of regulations and conditions needed to protect the environment.

(ii) Other implementing environmental conservation and protection institutions with which MEPA co-operates and co-ordinates include:

- The Ministry of Agriculture and Water: conservation and protection of range, forests, underground water, wildlife and conservation of fisheries;

- The General Directorate for National Parks;

- The Ministry of Health: public health;

- The Ministry of Municipality and Rural Affairs: Environmental health, urban disposal, quality of urban environment;

- The General Administration of Seaports: Monitoring and control of oil pollution from ships, oil spillage from all sources, and coast-water quality;

- Coast Guards: monitoring and reporting of oil pollution in Saudi waters, and playing a major role in combating oil pollution at sea.

(f) Gaps, constraints and remarks:

(i) The establishment of MEPA is a good indicator of national commitment to support and implement environmental conservation and protection activities. However, MEPA is working under several constraints which include: the scarcity of manpower trained in environmental protection owing to the availability of more attractive opportunities for Saudi nationals in other sectors, the difficulties of integrating environmental protection into regional administration and ministerial barriers in the face of better co-ordination with agencies involved in other aspects of environmental protection.

(ii) Saudi Arbia is a vast country and distances among cities and population centres are great; therefore a regional network of environmental monitoring and protection needs to be designed with minimal administrative centralization and with great autonomy in implementation;

(iii) Although MEPA is considered to be the central institution for environmental protection, there are several important functions which need to be added to its mandate. These include: monitoring of soil and

underground water, desertification monitoring and control, wildlife conservation and management, natural reserve management, central standards of occupational health hazards and, last but not least, control of pesticide residues.

2.3.10 Syria

(a) Policy formulation. There is no institution or body that is responsible for policy formulation in environmental protection. However, there are fragmented articles in various legislative acts which deal with environmental conservation and protection. These articles may constitute policy decisions in matters such as range management, urbanization management and waste disposal but they fall far short of consolidated policy which recognizes threats of pollutants to environment and commits the Government to combat, curb and/or control these threats. In addition to these decisions, there is the National Committee for Man and Biosphere which is one of the committees of the Higher Council of Sciences. The Committee has broad responsibilities to deal with man and his environment in Syria but does not have vehicles to implement such responsibilities.

(b) Planning and co-ordination. Again here, these functions are not designated to any institution or central body;

(c) Public awareness, information and education. Since there is no central institution responsible for environmental protection, these functions are dealt with as marginal activities of various governmental departments. Notable among these are materials published by individual scientists on natural resources and their management, water pollution, air pollution and protected forests and range areas;

(d) Manpower development and research. There are no formal programmes for training manpower in environmental protection in Syria. As in many other countries of the region subjects such as ecology, soil conservation and range management are taught as part of the curricula in colleges of agriculture and science in Syrian universities. Promotion of research activities in environmental protection fields is the responsibility of the Man and Biosphere Committee. However, individual research projects are carried out in areas such as soil salinity, water pollution, range management and monitoring of water resources.

(e) Implementing institutions. There is no central institution which is responsible for the implementation of environmental protection functions. However, some environmental monitoring and environmental protection are part of the regular activities of several departments distributed among several Ministries. Among such activities, and where they are carried out, are:

- Soil salinity monitoring in some parts of Syria, which is carried out by the Ministry of Euphrates Dam in the Gazira areas;

- Range, marginal lands and forest management is part of the functions of the Directorates of Forestry and Badia (Bedoin lands) in the Ministry of Agriculture and Agrarian Reform;

- Public health and monitoring of drinking water by the Ministry of Health.

(f) Gaps, constraints and remarks. Although some apsects of environmental protection such as range management are well attended to in Syria, there is no indication that the Government has taken major steps to consolidate the functions of environmental protection in a recognized institution. Functions such as environmental standards, air pollutant monitoring, water pollution monitoring, occupational health hazards, natural reserves and wildlife and the assessment of the environmental impact of industrial pollutants all need to be strengthened and assigned to a defined institution.

2.3.11 United Arab Emirates

(a) Policy formulation. The Higher Environmental Committee was reorganized in 1979 and was given new responsibilities to organize environmental protection affairs in the Emirates. Established by a decision of the Council of Ministers and chaired by the Minister of Health, the Committee has members representing the following:

- Ten members representing the Ministries of: Planning, Housing and City Planning, Water and Electricity, Agriculture and Fisheries, Health Oil and Mineral Wealth, Foreign Affairs, Finance and Industry and Information and Culture.

- Municipality Directors of cities of the United Arab Emirates. The Committee operates through a part-time secretariat in the Ministry of Health and meets occasionally to consider matters of environmental protection. Activities of the Committee in 1983 were all concentrated on measures to be taken by various Government authorities to monitor and protect the waters of the United Arab Emirates from oil spills of the Nowruz oilfield. The Committee activities of organizing environmental protection in the Emirates have not been substantial.

(b) Planning and co-ordination. These two functions are assigned to the Committee. However, there are no vehicles established as yet to implement such co-ordination or planning role.

(c) Public awareness, information and education. Again, there is no implementing institution responsible for preparation

and distribution of environmental educational materials and programmes.

(d) Manpower development and research. Manpower development programme are not available in the University of the United Arab Emirates or in any other training institution. Research in environmental areas is concentrated on that carried out by agricultural research centres on monitoring of underground water, and the implantation of trees in the Emirates.

(e) Implementing institutions. Most of the activities related to environmental protection are carried out by the municipalities of various Emirates. These include public health, drinking water quality control, waste disposal, occupational health hazards and general beautification of cities.

(f) Gaps, constraints and remarks. The United Arab Emirates does not have as yet a central institution of environmental protection. Furthermore, legislation needed to create a central authority is still to come. Like many countries of the region, the United Arab Emirates faces the constraint of a scarcity of trained manpower in environmental protection. Other constraints are the decentralized administration of urban centres where many of the environmental problems are present. There is a pressing need for consolidating the country's efforts systematically to monitor and manage ground-water resources, some range areas and, most important of all, the conservation of marine life and protection of coastal waters from pollution.

2.3.12 Yemen Arab Republic

(a) Policy formulation, (b) planning and co-ordination, (c) public awareness information and education and (d) manpower development and research: the Yemen Arab Republic is in the initial stages of considering policy, planning and other issues mentioned above that pertain to environmental protection. Although the Yemen Arab Republic participates in regional efforts for environmental protection, the national concerns about environmental protection have not yet materialized into actions. The modern environmental problems facing the Yemen Arab Republic are not of the type facing other countries with oil industries or with developed industrial and public facility infrastructures. However, there are pressing environmental considerations, and measures need to be taken for the proper utilization and mangement of natural resources. These include underground water, soil erosion, deforestation and fisheries.

(e) Implementing institutions: the General Directorate of Environmental Health in the Ministry of Municipalities is co-operating with the Public Health Directorate in the Ministry of Health in implementing basic public health and sanitary activities designed to deal with environmental problems of expanding urban centres in the Yemen Arab Republic. The Direc-

torate has several divisions which implement measures and activities to monitor and manage basic public health aspects in: food, sanitation, slaughterhouse, rodent and insect control, sewage and solid waste (urban) disposal.

Monitoring of drinking water is carried out by the Ministry of Health.

Other aspects related to range management and fisheries are administered by the Ministry of Agriculture and Fisheries.

2.3.13 Yemen, People's Democratic Republic of

(a) Policy formulation. The People's Democratic Republic of Yemen passed Law No. 13 for 1976 by which the National Council for Environment was established. However, the Council has not been active in formulating national policies. Most of the policy decisions are formulated in national plans approved by the Council of Ministers. The Council is chaired by the Minister of Health and has members representing the the Ministries of Agriculture and Agrarian Reform, Planning, Fisheries, Labour and Communication. In addition there are members representing the General Organization of Water, the Governorate of Aden and the Aden Port Authority. However, a decree law No. 8 was promulgated recently on 5 February 1984, forming a new Council for the Protection of the Environment. The Council is chaired by the Minister of Public Health and represented by ministries having environment-oriented activities within their development plans. A permanent secretariat of technical nature is under formulation to assist the National Council in carrying out its duties and following up the enforcement of its orders and recommendations. These developments reflect government awareness of the need to strengthen the implementing vehicles in environmental protection.

(b) Planning and co-ordination. These two functions are also part of the responsibilities of the Council. Again, there are no vehicles for implementation and planning and co-ordination are not strong. However, with the newly formed Council, planning and co-ordination of environment activities are envisaged in its entrusted mandate.

(c) Public awareness, information and education. Published information on environmental protection is scarce in the People's Democratic Republic of Yemen. Since there is no institution responsible for the preparation and distribution of information materials, such activities are treated marginally by other departments working in fields related to environmental protection.

(d) Manpower development and research. As in many countries of the ECWA region, manpower training programmes in environmental protection are not part of the curricula of

educational institutions. Hence there is great need to develop a core of environmental protection specialists and technicians through regional training programmes and/or fellowships abroad.

Research in areas related to environment protection is being carried out in several institutions and it involves:

- Conservation and management of fisheries in the Marine Science Institute, Ministry of Fisheries;

- Combating desertification and monitoring of soil and water salinity in the Ministry of Agriculture and Agrarian Reform, Department of Agricultural Research and Extension.

(e) Implementing institutions: Although there is no institution in charge of implementing environmental protection measures, there are several activities being carried out in the People's Democratic Republic of Yemen and they include:

- Monitoring and control of drinking water: General Organization of Water;

- Occupational health: Ministry of Health;

- Desertification control and range management: Ministry of Agriculture and Agrarian Reform;

- Conservation and management of marine life: Ministry of Fisheries.

(f) Gaps, constraints and remarks. There is a great need to strengthen environmental protection activities in the People's Democratic Republic of Yemen. The consolidation of such activities under an organized institution is important in the promotion and implementation of much needed environmental conservation and protection functions. Functions include: monitoring and management of underground water utilization, monitoring and management of soil and rangeland, monitoring and management of marine water pollution in coastal waters, especially in the port of Aden, and last but not least establishing environmental standards for pollution under conditions in the country. Building manpower capacity as well as physical facilities for environmental protection are areas which need to be strengthened and constitute major constraints.

2.4 How countries of the ECWA region have responded regionally in dealing with environmental protection

Groups of countries of the ECWA region share several resources, among them the Red Sea, the Gulf, the Hamad arid lands and some rivers. In recent years efforts from regional, international and national organizations have resulted in the conclusion of regional co-operative programme agreements and/or

protocols aimed at integrating groups of countries' efforts in dealing with environmental problems. These will be reviewed in the following paragraphs to exemplify patterns of institutional or regional vehicles of co-operation in the field of environmental conservation and protection.

2.4.1 Regional environmental programme of the Red Sea and the Gulf of Aden

In 1982 four ECWA countries plus two Arab countries bordering the Red Sea and/or the Gulf of Aden (Sudan and Somalia) and the Palestine Liberation Organization (region) signed a document calling for co-operation in environmental conservation and protection of marine life and the waters of the Red Sea and the Gulf of Aden. The four countries of the ECWA region are: Jordan, Saudi Arabia, Yemen Arab Republic and Yemen, People's Democratic Republic.

The signed document includes the following:

(a) Plan of action for the conservation of the marine environment and coastal areas of the Red Sea and the Gulf of Aden;

(b) Regional agreement for the conservation of the marine environment of the Red Sea and Gulf of Aden;

(c) Protocol for regional co-operation to control pollution by oil and other harmful materials in case of emergency;

A brief review will be presented as follows to highlight each of the above:

(1) Plan of action for the conservation of the marine environment and coastal areas of the Red Sea and the Gulf of Aden: The plan is composed of four major parts which may be summarized as follows:

(i) Evaluation and determination of the state of the environment. This includes a survey of national capacities of the region in marine sciences including institutions, manpower, legislative acts, published material and research centres. It also includes determination and evaluation of geological and geophysical processes, oil pollutants, and other pollutants including industrial and urban wastes.

(ii) Environmental management. This includes the evaluation of present and future developmental projects which may influence the environment, rationalization of marine resources, the establishment of marine and coastal reserves and the development of national capacities in areas of marine conservation. It also includes the co-ordination

of national efforts in regional plans to control oil pollution, policies of water management and exchange of information.

(iii) Organizational and financial arrangements. The plan calls for the establishment of a regional organization for the conservation of the marine environment of the Red Sea and the Gulf of Aden. Until such an organization is established, ALESCO will undertake the arrangements necessary to co-ordinate and implement the plan of action.

The plan calls also for the establishment of a regional centre for mutual assistance in emergency situations. The plan of action will be financed initially by contributions from ALESCO and member countries as follows:

- ALESCO: 1 million United States dollars.

- 6 million dollars for two years, divided according to the following percentages: Jordan 6.574 per cent, Saudi Arabia 58.468 per cent, Sudan 19.266 per cent, and 5.224 per cent each for Somalia, the Yemen Arab Republic and the People's Democratic Republic of Yemen.

(iv) Legal aspects: Countries of the region will sign the regional agreement for the conservation of the environment of the Red Sea and the Gulf of Aden. In addition ALESCO will formulate protocols to be signed by member States covering areas which include: pollution resulting from the utilization of the marine environment, development of marine resources, compensation for dangers resulting from pollution of the marine environment and pollution from inland-based sources. The plan of action is in operation now and some of the activities have been implemented. The headquarters of the temporary committee supervising implementation is in Jedda, Saudi Arabia.

(2) Regional agreement for the conservation of the environment of the Red Sea and the Gulf of Aden. The agreement was signed in 1982 and it includes 29 articles which organize administrative, legal, compensatory, financial and scientific matters related to conservation of the environment and its protection from pollution and overexploitation.

(3) Protocol for regional co-operation to control pollution by oil and other harmful materials in cases of emergency. Again this protocol was signed by all member States of the region in 1980. The protocol calls for the establishment of a centre for

mutual assistance in marine emergency situations resulting from oil or other dangerous materials. The protocol is composed of 13 articles which organize the administrative, legal, financial, national participation and operation of the centre. The centre has not been established as yet but contacts are being made by ALECSO for that purpose.

2.4.2 Regional Organization for the Protection of the Marine Environment (ROPME)

The co-operative efforts of seven ECWA countries and Iran and the help of international and regional organizations (mainly UNEP) finally led to the establishment of ROPME, which is presently operating from its headquarters in Kuwait. ECWA countries which are members of ROPME are Bahrain, Iraq, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates. ROPME is the one of the fruits of the regional co-operative efforts of countries of the Gulf region. In 1978 the seven countries signed a document which adopted the following:

(a) A plan of action for the protection and development of the marine environment and coastal areas of the Gulf;

(b) The Kuwaiti regional convention for co-operation on the protection of the marine environment from pollution;

(c) Protocol of co-operation in combating pollution by oil and other harmful materials in cases of emergency. The arrangement for programme agreement and protocol are almost identical to those discussed for the Red Sea and the Gulf of Aden in paragraph 2.4.1 and there is no need to discuss them in detail again here.

The operational activities of ROPME are significant and can be summarized as follows:-

2.4.2.1 Financial arrangements. ROPME operates from a trust fund of 6 million United States dollars managed by UNEP as well as contributions from member States. The fund was established from contributions of member States of ROPME as follows: 2 per cent each from Bahrain and Oman; 20 per cent each from Saudi Arabia and Iraq; 14 per cent each from Kuwait and the United Arab Emirates; 12 per cent from Qatar and 16 per cent from Iran.

2.4.2.2 Administration. The headquarters of ROPME is in Kuwait, the executive secretary is the Minister of Health of Kuwait and the secretariat is operational and manned by a multinational nucleus of officers and supportive staff.

2.4.2.3 Activities and implementing units. The bulk of the plan of action is being implemented by national institutions of the region through contracts arranged by UNEP and the ROPME sec-

retariat. Another activity is the creation of the centre for emergency cases to implement the protocol for combating air pollution. This is located in Banrain. A third activity is the training courses for technicians in the region in various analytical and instrumental methods to monitor water pollution. Most of the training is being contracted to the Kuwait Institute of Scientific Research.

2.4.2.4 ROPME and UNEP are following up with member countries to agree on further protocols and to strengthen national capacity necessary for the implementation of the plan of action. Another activity which ROPME is planning to implement is a regional centre for receiving ship disposals and ballast water of oil tankers.

2.4.3 Gulf Co-operation Council (GCC)

In 1981, six Arab Gulf States, namely, Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates, signed an agreement calling for the establishment of a regional co-operation and integration vehicle, which is now called the Gulf Co-operation Council. The basic objectives of GCC are:

- To achieve co-operation, integration and bonds among member States in all fields as steps towards their unity;

- To strengthen present bonds and linkages and co-operation between peoples of member States in various fields;

- To formulate and adopt similar systems in various fields including the following: economic and financial affairs; trade, customs and communication fields; cultural and educational affairs; social and health affairs; information and tourism affairs; and legislative and administrative affairs.

- To promote and support scientific and technological activities for the development of industry, mineral utilization, agriculture, marine and animal resources, and the establishment of co-operative research centres and developmental projects as well as the promotion of co-operation of private sectors, all in a way that will serve the welfare of its people.

GCC is operating from its headquarters in Riyadh, Saudi Arabia through three vehicles, which are:

(1) The Higher Council composed of heads of States;

(2) The Ministerial Council composed of Ministers of Foreign Affairs of each State;

(3) The General Secretariat which is the implementing apparatus of GCC and consists at present of the following:

- A Secretary General with assistants;

- Three sectors, one each for Political Affairs, Economic Affairs and Man and Biosphere.

The Man and Biosphere sector is what concerns us in this study, and it is composed of six directorates: education, culture, manpower development, youth and sport, social affairs and environment.

The environment unit is in its initial stages of building its capacity and organizing its activities. Planned activities are:

- Co-ordination among countries in environmental protection;

- Co-operation with national and regional institutions in the region to strengthen their efforts in the conservation and protection of the environment, including conferences and information and fulfilment of GCC objectives in the area of environment.

3. Organizational model for institutions of environmental conservation and protection in countries of the ECWA region

3.1 Introductory remarks on functions and structures. Countries of the ECWA region, as shown in the review presented in the second section of this paper, are in the midst of organizing and building their national environmental institutions. Some of the countries of the region have reached an advanced stage in the articulation of the issues facing them in environmental conservation and protection and have gone ahead in building institutions and establishing bodies to service their needs both at national and regional levels; some other countries however, are still in the intitial stages of materializing environmental awareness into action.

The majority of the countries, however, have started the process of taking steps towards organizing a national response to conserve and protect their environment. The objective of this section is to analyse the various functional and structural aspects of environmental institution building.

The analysis will focus on concepts and components of institution building. These include: national strategies, national policies, planning of major national programmes including priority determination, legislation, co-ordination, monitoring and evaluation of programmes, functions to be implemented to serve national needs, linkages with other inside and outside institutions and/or organizations concerned with environment.

The analysis will also focus on alternate bodies, vehicles and/or institutional structures through which functions are to be implemented. It is noteworthy to state, in this context, that different countries may follow different approaches to how they structure or name environmental institutions, but there are features and/or concepts common to institution building that each country should take into consideration in the course of institutionalizing environmental conservation and protection. These are as follows:

(a) The institution should serve the national objectives and should be consistent with such objectives.

(b) The functional organization (functions implemented) of the organization should take into account current needs and respond to future ones in a way that would conserve, manage and protect those elements and resources of the environment important to the country both at the national and regional level. In other words, the function performed should reflect national objectives as well as specific needs of the country in question as an entity in itself, as part of an environmental region and as part of a whole interdependent global environment.

(c) The institution should enjoy legal, financial, administrative and operational autonomy and flexibility consistent with its objectives.

(d) The physical, manpower and operational resources and capacity of the institution should be consistent with its objectives so as to enable it to implement its functions as effectively as possible under national conditions.

With these introductory remarks, we proceed to an analysis of the various functions involved in institution building.

3.2 Formulation of national strategies in environmental conservation and protection. Each of the countries of the ECWA region has embarked on the implementation of short and long-term social and economic developmental plans aimed at improving the welfare and standard of living of its people. In this endeavour, there is enough evidence now to indicate that such human activities should be linked with a national strategy which should determine among other things the following:

- What limits and measures should be taken to ensure the continuous utilization of renewable natural resources of the environment (notably plants, wildlife, forests, grazing lands, fisheries and other forms of life);

- What are the limits of utilization and the measures to be taken to ensure continuous utilization of soil, water, and nutrients, in such a way that processes of regeneration, cleaning and/or recycling of such resources are maintained and protected for the short and long-term benefits of man;

- To what extent should man's activities be allowed to bring about detrimental irreversible changes in the genetic diversity of fauna and flora, in water and soil regeneration, in recycling of elements in biological ecosystems and in the components of air;

- And last but not least what are the moral and social obligations of each generation of man in determining the quality and quantity of renewable and non-renewable (oil, fossil fuels, ground-water, minerals) resources of the environment and transmitting this knowledge to the next generation.

All of the above are basic questions that should be answered in the national strategy of any State when considering short and long-term social and economic development.

The question then arises as to who should formulate environmental strategy, who should approve it, and who should enforce it. Formulation and approval of strategies are not everyday or even every-year occurrences. The enforcement of strategies, however, is an almost everyday occurrence. Hence

the formulation of strategies should be carried out by a group of senior experts who are a mixture of scientists, developmental leaders and policy-makers both in the legislative and executive branches of government. They can be drawn from their respective fields representing major sectors of scientific disciplines (basic sciences, agriculture, engineering, ecology and environmental management) as senior developmental experts and policy-makers in both the social and economic fields.

Approval of strategy should come from the highest legislative and executive body of the State.

Enforcement of strategy should be reflected in all related legislative acts and should be defined in the functions of implementing institutions dealing with environmental conservation and protection.

3.3 Formulation of national policies. National policies of environmental conservation and protection are usually of shorter term duration than strategies. They may be modified or changed over relatively short periods of time. Hence their formulation should be the responsibility of a permanent recognized body. Such a body should be, or should have under its disposal, competent experts to perform the function.

The status of individuals formulating policies should again be of senior official and expert level. Because environment touches on the work of many sectors, a policy-formulating body should be drawn from those sectors which influence or are influenced by environmental conservation and protection policies.

Policy formulation is the process of translating strategy into planning, programming, priority determination and legislative and financial support and the creation of institutions to implement functions of environmental conservation and protection.

Approval of formulated policies should come from the highest legislative and/or executive body of the State as the case may be in each State. Furthermore, the chairman of the national policy-formulating body should report to the Prime Minister or the highest executive office in the country.

Examples of policy matters are:

- Legislative acts (usually laws) regulating the utilization of natural resources and legislative acts regulating the management and protection of marine and terrestrial national parks, natural reserves and animal and plant wild life;

- Legislative acts defining standards and conditions that are prerequisites to the establishment and/or operation of industries and other public facilities which either constitute

source of environmental pollution or may have a harmful impact (short or long-term) on the environment;

- Establishment of institutions responsible for environmental conservation and protection on a national level as well as the determination of status, functions and authority of such institutions;

- Signing of agreements and protocols for regional and international co-operation.

Policy-formulating bodies should be composed of senior officials. These officials usually cannot spare the time required for actual formulation of policy but rather review it and pass it to higher bodies for approval. It is imperative therefore that a vehicle be defined for actual preparation of policy working papers, legislative acts and any other function connected with policy formulation. The vehicle can be one of the following:

- Executive secretariat for policy formulation; or

- Better yet, a special policy affairs unit within the structure of the environmental conservation and protection institution.

Needless to say, such a unit may have other functions similar in nature and related to the formulation, co-ordination or monitoring of policies and their implementation.

3.4 Planning of national programmes. Environmental conservation and protection functions are by their nature interrelated to other functions pertaining to utilization of environmental resources. Therefore planning of major national programmes in environmental conservation and protection, including priority determination, should be the function of a larger senior group representing various sectors concerned with the utilization as well as the conservation and protection of resources. The responsibility of this function should therefore be that of the national policy-formulating body. Planned programmes should be part of the national social and economic development plan and should be approved in the same manner as that of the developmental plan.

Examples of national programmes that enter into this category are: conservation and management of national parks and natural reserves, conservation and management of soil, water, forests, rangelands, marine life, wild life, environmental urban management, manpower planning and combating pollution.

3.5 Legislation. Formulation of new legislation and changes in the old are part of a function which should be the responsibility of one of the following alternate bodies:

(a) Special unit within the national institution responsible for the implementation of environmental conservation and protection;

(b) Executive secretariat of national policy-formulating body.

In any case formulated legislation should be reviewed by the policy-formulating body before being forwarded to the authorities concerned for final approval. Legislation is the written laws and by-laws in which a State translates much of is strategies and policies and defines the ways and means of enforcing them. Examples of such legislation are:

- Establishment of institution of environmental conservation and protection, definition of its functions and authorities and major modes of operation;

- Establishment, management and protection of national parks;

- Definition and determination of environmental protection standards and ways and means of enforcing such standards. Standards as used here are those which should provide the base for the evaluation and regulation of present and future industrial, urban and other activities with the aim of sustaining a clean and safe environment;

- The ways and means of managing and utilizing natural resources such as soil, water, forests, range lands, fisheries with the aim of conserving such resources and rationalizing their utilization.

3.6 Co-ordination. What is meant here is the co-ordination of environmental conservation and protection activities with those being implemented in the utilization of environmental resources: hence it is not the co-ordination among several institutions implementing different functions of environmental conservation and protection. The co-ordination function therefore should be under the responsibility of the institution implementing actual work in the field of conservation and protection. The framework and policies of co-ordination should be dealt with by the policy-formulating body. However, actual co-ordination should be left to implementing agencies to be carried out within a framework of set policies. What we are saying here is that a committee or group of people have not been successful in co-ordinating work being implemented by several institutions. Co-ordination is a time-consuming and demanding function; it has its rules and procedures and should be handled by an identified individual or individuals within the concerned institution.

3.7 Monitoring and evaluation of programmes. The institution-implementing functions for the conservation and protection of the environment should have their own rules, procedures and manpower to monitor (follow up) implemented functions. However, evaluation of the institution's output should be carried out by a unit manned by individuals from outside the institution.

Criteria for evaluation should be established in order that both parties concerned take note of it. The reason why such a function is included here is in recognition of the importance of proper and effective implementation of environmental conservation and protection activities, including the enforcement of environmental standards as well as ways and means of utilizing national resources.

3.8 Functions of implementation of environmental conservation and protection. Any institution concerned with the actual implementation of activities in the areas of environmental conservation and protection must have defined functions. These are referred to here as functional units. One or more of the functional units may constitute a structural unit in the overall organization of the institution. The following will be a presentation of the nature of activities included under each functional unit. The functional units may be viewed as the building blocks when organizing (or "building") an institution.

3.8.1 Monitoring of fresh-water resources. This functional unit has the responsibility of sampling and testing of fresh water, recording, documenting, analysing and reporting the results of such tests in order to evaluate and regulate the quality of fresh water resources in the country. This invovles:

- Sampling. Should be according to standardized procedures recognized by scientific or professional societies or organizations. Sampling should cover all major sources of water defined by concerned authorities. Sampling should be also done periodically on a regular basis as specified by the institution or the standard procedures.

- Testing. Tests for the presence of biological contaminants, chemical pollutants, including organic materials, solid particles, salts and other physical properties needed for the proper utilization of water in each case (drinking, household, industrial or irrigation for agricultural production).

- Recording and documenting of results. This should be done on forms approved by the authorities for the purpose of short and long-term monitoring.

- Analysis of results. Results of testing should be analysed vis-a-vis enforced standards of water quality regarding the purpose for which the water is used.

- Reporting of results. Results of monitoring should be forwarded to the concerned authorities on a specified periodic basis so that the needed measures can be taken to conserve and/or protect water resources as the case requires and regulations call for.

Monitoring of fresh water is becoming an essential service to collect a needed information base on which to design conservation and protection measures. No one argues about the importance of water in ECWA countries and now vital it is to maintain and utilize every drop of good quality water for various uses. Since water resources are so close to liquid and solid wastes of industries and urban centres, it is imperative for almost every country of the ECWA region to establish a monitoring service for early discovery of any harmful changes and to design and implement protection measures. It has been said that polluting underground water may take one month or less, but that eliminating the pollution may take 50 years and at a high cost.

It should be emphasized here that monitoring of drinking water should be the function of a sub-unit of this major unit since water supply for drinking and domestic use is integrated with fresh water resources in the country.

3.8.2 Monitoring of marine water and marine life. This functional unit has the responsibility of sampling and testing, recording, documenting, analysing and reporting results of tests on the environmental state of marine waters and marine life. It deals with the following:

- For marine waters, activities are similar to those of fresh water except for the use of standards and procedures that relate to marine waters.

- For marine life, testing should be by type, and by numbers of marine life species in marine ecosystems. In addition, checks should be made on any poisonous or toxic materials deposited in the bodies of edible species.

Monitoring reports should be used as an information base for development, management and protection of marine life. Once an evaluation of the state of environment of marine life (based on approved standards) is made at every required period, it should be communicated to the concerned agencies with a recommendation for corrective or protective measures.

3.8.3 Monitoring of agricultural soil. This functional unit has the responsibility of sampling and testing of agricultural soils and recording, documenting, analysing and reporting the results of such tests in order to evaluate the state of such agricultural soils in the country. In addition, the results of monitoring are valuable as a source of information for research-

ers as well as for educational programmes. The sampling, testing and analysis involve the following:

- Sampling. Should be according to standard procedures approved by the institution. Sampling should cover all major locations specified by the institution and in the approved periodicity.

- Testing. Physical and chemical properties of soil should be tested as approved by the institution. Salinity, fertility, pollution and erosion should be among the indicated tests as cases may require.

- Analysis and reporting of results. Results should be analysed and reported on the approved forms. Analysis should look for indicators of deterioration in physical as well as chemical properties. Reports and evaluation of results should be forwarded to concerned authorities for corrective or protective measures.

3.8.4 Monitoring of air. This functional unit has the responsibility of sampling and testing, recording, documenting, analysing and reporting the results of tests on air quality. Reported results should be evaluated and sent to the concerned authorities for protection measures. The sampling, testing, analysis and documentation involve the following:

- Sampling. Samples of air should be taken according to standard procedures for various gases, should cover major industrial and urban areas at intervals covering peak industrial and human activities and various seasons of the year.

- Testing. Testing should focus on type and quantity of gases known to be emitted by sources of pollution, dust particles, other solid particles, pollen grains and other physical and chemical properties particular to a micro-environment.

- Analysis. Results of tests should be compared with environmental standards approved by the institution and considered as limits for clean or polluted air.

- Documentation. Reported results should be documented to form a data base for future reference in determining changes in the state of environment of air as well as for purposes of research and educational programmes.

3.8.5 Monitoring of forest and range ecosystems. This functional unit has the responsibility of monitoring the type and size of changes that take place in forest and range ecosystems, terrestrial national parks, natural resources as well as other major sites of forested areas and rangelands under utilization. The activities include field tests and surveys, recording, documenting and reporting of results of tests and

surveys. Analysis and evaluation of the state of environment in each ecosystem should be reported to the concerned authorities for action. The tests and documentation involve the following:

- Tests and surveys. Tests should include sample checks on type and density of vegetation, destructive insects or disease encountered, indicators of deterioration as a result of human activities or natural factors such as fire, erosion, overgrazing, illegal plowing, illegal tree cutting, illegal wood and bush collection, overcutting of medicinal or edible wild plants and overcutting of wild flowers. Since forests and rangelands in the ECWA region have suffered greatly from overcutting and overgrazing, positive development of the resource should also be surveyed.

- Documentation. Results of tests and surveys should be documented for an information base for periodic evaluation of the state of the environment in these resources and to plan for conservation and protection measures.

3.8.6 Monitoring, management and protection of birds and other wildlife. This function includes the carrying out of tests and surveys and population counts of domestic birds, mammals and other forms of wildlife as well as migratory birds in national parks, natural reserves and other open areas. Tests and surveys should be carried out periodically to include hunting seasons, if any, breeding and migratory seasons.

The function of this unit should include the development and management of food and water resources and the enforcement of laws and regulations related to the protection of birds and wildlife through the following:

- Tests and surveys. Tests should look, among other things, for pests infecting wildlife, at the type and size of flocks or herds, for indications of illegal hunting, at the type and number of migrating populations of birds, at the movement of herds from one location to another and for signs of overgrazing and signs of predators.

- Documentation and reporting. Results of tests and surveys should be documented on approved forms for future use in determining the state of the environment for such resources and for information regarding migratory birds and other migratory mammals.

- Enforcement of laws and regulations. Individuals in charge of this activity should be mobile, provided with communication systems and have the authority to confiscate weapons and hunted animals and to bring violators to court for fines.

3.8.7 Monitoring and protection of labour working environment. This unit has the responsibility of:

(a) Ensuring the safety of labourers and prevention of occupational hazards;

(b) Enforcement of working environmental standards which ensure the maintenance of a clean and safe working environment for labourers in industry, public services, construction and other development projects. To this end the functions of the unit include:

(i) Sampling, testing, analysing of air (in case labourers are working with volatile chemicals in-doors, then reporting results to concerned authorities for needed action. Analysis should be compared with approved standards of air constituents in workplaces.

(ii) Ensuring that labourers use protective implements such as protective clothing, eyeglasses, gloves, head protection helmets and/or boots while working under exposure to materials either harmful to health or working with machines that may cause hazards when labourers are not protected.

(iii) Ensuring that labourers suffering from occupational accidents, hazards or illness are compensated as laws and regulations call for.

3.8.7.1 Monitoring of food quality and food sanitation: Food materials consumed by man whether fresh or processed should be monitored according to defind standards. Monitoring should include looking for biological contaminants which cause diseases or spoilage, chemical contaminants which are harmful to man if they exceed certain levels and physical abnormalities. Among the chemical contaminants are pesticidal residues, chemical additives and chemical toxicants resulting frommicro-organism activities. Sampling of food materials such as meat, milk products and canned foods should be carried out on a regular basis within the processing plant itself. In addition, monitoring from the functional unit should be carried out with a frequency which ensures safe use of such products.

3.8.8 Monitoring of noise. The function of this unit is to monitor volume, frequency and sources of noises in residential areas, workplaces and other public facilities. Records of noise should be analysed and reports should be sent to the authorities for action.

3.8.9 Environmental evaluation and environmental standards. This is perhaps one of the most important functions of an environmental protection institution. The functional unit in question is responsible for environmental standards, forwarding

them to the concerned authorities for approval, and reviewing approved standards for further refinement or modifications.

Once the standards are approved, they are then passed to all monitoring and regulatory officers for enforcement. There are two major groups of standards:

(a) Environmental quality standards for resources and processed materials. These are standards determining the maximum limits of contaminants or pollutants allowed to be present in open air, ambient air inside industrial plants, mines or any other place, water utilized for various usages, soil and food materials liquid or solid. These limits are usually known by experimental evidence to cause harm to man, plants and/or animals either in the short or long term.

(b) Environmental standards for sources of pollutants. There are pollution control technologies or operational standards that are applied or used to reduce pollution from facilities. Standards also include the type and level of pollutants that are allowed to be discharged into the environment. A facility may be a vehicle, an industrial plant, waste treatment plants, power-generating plants, public service facility, food production or processing facility gas stations, car service stations etc. Another function of this unit is the overall evaluation of environmental monitoring results from various units. The product for overall evaluation enters as input in the national report of the state of the environment as well as reference for the preparation of environmental information.

3.8.10 Assessment of the environmental impact of projects. The functions of this unit including the following:

(a) Preparation of conditions and requirements which should be considered when licensing or approving the establishment of projects. All of this is to be in addition to evaluating standards for pollutants.

(b) Study of projects (industrial plants, housing schemes, power plants, public facilities, processing plants, dams and irrigation schemes, etc.) to assess and determine present and future negative impacts on the element or resources of the environment in question. Determination will focus, among other things, on whether these projects constitute sources of pollution, cause major changes or influences on flora and fauna of the environment, or cause major changes on the underground recharge supply. Assessments are made according to standards approved for the country.

(c) Enforcement of source standards, conditions and requirement when considering licensing of new projects or renewing old licences of projects.

3.8.11 Preparation of environmental information and educational materials. The responsibility of this unit is to prepare slides, films, posters, popular articles, popular magazines and reference materials on environment. Such prepared material is to be provided to the public information media, school officials and other information channals to promote public awareness. Such material can also be used as reference for educational programmes at schools in the country.

3.8.12 Research and training. These two functions are essential for the effective performance of environmental protection. However, they do not have to be part of the functions of the institution itself. Some training could be done on the job, but more specialized training should be implemented by other institutions with a stronger capacity to do the training. Planning of manpower training, financing, monitoring and evaluation of such training should all be initiated by the environmental protection institution itself.

Research is important for the preparation and refinement of environmental standards, for the production of technologies and methods to reduce the discharge of pollutants from various sources, for the management of natural resources and for developing methods to combat desertification. Some of the research needs could be implemented by environmental protection institutions, but others that require more qualified manpower and facilities could be contracted to other more specialized research institutions in the country. In all cases the identification of needs, some if not all of the financing and monitoring of both functions, research and training, should be initiated and handled by the environmental protection institution.

3.8.13 Linkages. All institutions need to provide special vehicles of linkages within them and with other institutions within the country as well as outside. Environmental protection institutions, by the nature of their functions and responsibilities, are in greater need of such linkage vehicles. Linkages may be referred to as working relationships within the institution and with others outside, but the term is much broader than that. The environmental protection institution needs financial support from policy or decision-makers in the country. It needs to establish a working relationship with other institutions utilizing resources which it is protecting. The institution also needs to establish relationships with research, information educationa, and training institutions in the country and, last but not least, it needs to establish relationships, co-operative or otherwise, with outside national, regional or international institutions or organizations working in the field of environment. Vehicles for such linkages should be created. They can be functional units, part of one or an office attached to the head of the institution. Linkages are not to be mistaken for public relation offices or units; public relations are part of

linkages. Such an activity has developed substantially in modern institution-building concepts and is considered in the case of many as vital for the successful and effective operation of the institution.

3.8.14 Selection. The previous paragraphs of this section were a survey of major functional units needed for environmental protection service institutions. The question now arises as to how one country selects the ones that should be included in its protection institution. The answer is that needs of the country must dictate which ones are important enough to warrant their inclusion in the overall functions of its own institution. The second question that is raised is how selected functions should be organized structurally. Part of the answer depends on how extensive is the work and scope of each function in a particular situation in a country. Naturally, there is a critical mass of work that should be in a function to warrant establishing an administrative structure for it. A country that has a small area of agricultural soil may not find it necessary to establish a structural unit (division, department or directorate) for the function of monitoring the resource. In this case soil monitoring could be added to the function or functions of another structural unit. The same can be said about a country that has vast resources of rangelands which could then warrant establishing a structural unit within the institution for monitoring management and protection of the resource. Perhaps these two examples suffice to illustrate how functional units are to be organized in structural ones. However, no matter what the choice of the country may be in determining size and number of structural units, it should be recognized that environment is an integrated and dynamic system. Therefore, allocation of manpower, facilities and operational funds for all needed functions is essential for the effective performance of an environmental protection institution. Such allocations must be consistent with the importance and the scope of each function.

4. Conclusion and recommendations

4.1 General remarks. Some of the countries of the ECWA region have taken admirable steps in establishing environmental protection institutions and allocating resources for the operation of such institutions. However, it is perhaps fair to say that the institutionalization of environmental protection has not received the national commitment which is congruent with the needs of many countries of the region. There are already many alarming cases of environmental resources deterioration in more than one country of the ECWA region. Some of these cases have not occured perhaps at the speed of the Nowruz oil spill in the waters of the Gulf, but they do have far-reaching threats on the safety and productivity of natural resources. Desertification, over pumping of under-ground water, unplanned urbanization, the loss of agricultural land to construction projects and the increasing growth of pullution sources are all major problems which warrant urgent actions both at the national and regional level. One may ask why countries do not hesitate to establish services and institutions to utilize environmental resources, but are slow to respond in establishing institutions to keep these resources productive. By the same token, why do countries promote the establishment of industries and other public facilities that pollute environment but are not as enthusiatic to promote measures and actions to keep the environment clean and safe. This study is intended to contribute to the efforts being made by national governments and regional and international organizations to help to strengthen the institutional organization of environmental protection in the countries of the ECWA region.

4.2 Some constraints that need regional action. Constraints facing institution-building of environmental protection in countries of the ECWA region are multifaceted. It is beyond the scope of this study to analyse each one of the constraints. However, there is a case to be made in every country for starting the process of establishing specialized institutions for environmental protection or strengthening existing ones. The third section of this study presents a model for necessary functions to be considered by each country when embarking on the course of establishing such institutions.

4.3 Recommended future action for ECWA. It is recommended that ECWA should:

(a) Hold an expert meeting to discuss the issues of institution-building arising from the present study or the countrys' comments. The expert meeting may be composed of individuals representing each country or a selected number of countries of the region;

(b) Identify areas where ECWA alone, or in co-operation with organizations such as UNEP, needs to be addressed in future action.

4.4 Regional co-operation to strengthen the environmental institutional capacities of ECWA countries.

4.4.1 Training of manpower: As mentioned above, several countries of the region suffer from a scarcity of manpower trained in environmental protection and conservation. At the same time many of these countries are too small either to afford or have the critical mass of manpower needed to start a training programme of their own. It is not only trained manpower that is scarce but also the trainers themselves. Therefore it is proposed here that three types of training programmes be promoted and initiated in the field of environmental protection and conservation as follows:

(a) An integrated programme leading to a B.S.C. in environmental protection and conservation under the following conditions:

(i) Duration of programme: four years;

(ii) Participants: high school graduates for the B.S.C. programme;

(iii) Place: to be attached to one of the existing universities in the region. The university to be designated by the countries participating in the programme;

(iv) Type of output: graduates who are well trained in an integrated approach in environmental sciences, methods of environmental standards, environmental protection and conservation measures, i.e. legal management, and technical aspects;

(v) Source of finance: to be shared by participating countries plus fees, to be charged according to the number of participants. Provisions should be made for scholarships to be provided by national, regional or international agencies concerned with the environment and its protection.

(b) An integrated programme leading to a higher diploma in environmental protection and conservation under the following conditions:

(i) Duration: two years;

(ii) Participants: B.S.C. graduates in fields which include biological sciences, engineering fields related to environment, chemistry and public health;

(iii) Place: to be attached to one of the existing universities in the countries of the region, the university to be designated by countries participating in the programme;

(iv) Output: training in environmental protection and conservation similar in scope to programme (a) but concentrating on areas and courses designed to fill gaps in the training of B.S.C. graduates with a scientific base but in need of special training in environmental protection;

(v) Sources of finance: core budget to be shared by participating countries plus fee charges per trainee. Provision should be made for scholarships to individual participants from less developed countries.

(c) Short course training programmes in special topics in environmental protection and conservation:

(i) Types: short courses are to be designed to meet the special needs of people already working or disignated to work in the field of environmental protection. Examples are: management of natural resources or national parks, sampling techniques analysis (chemical and/or biological), techniques for environmental monitoring, operation and maintenance of equipment used in environmental analysis, and environmental standards: what they are, how they are enforced and managed;

(ii) Participants: high school graduates, B.S.C. graduates or other technicians who have been designated to work in environmental protection;

(iii) Duration: some courses could be four weeks while others could extend to six months;

(iv) Place: short courses do not have to be held in one place. One could be held in an institution which has the capacity for instrumental analysis for example, while another short course could be held in another institution of the participating countries;

(v) Source of finance: sources may come from participating countries, regional and/or international agencies.

4.4.2 Regional Information Network. A regional network should be established for exchange of information on: state of environment in each country, environmental standards, pollution accidents and how to deal with them, new techniques for monitoring and information materials for public awareness, which is of paramount importance to the region. The arm of the network could be a newsletter in the national language, Arabic, to be distributed to workers and other individuals concerned with environment.

4.4.3 Regional research programmes. There are already two co-operative regional programmes with an element of research in each for both the Gulf area and the Red Sea. A third project is being developed by UNEP for desertification control. Among other projects of regional impact which could be promoted and formulated are:

(a) Air pollution: study of air currents and sources of air pollution;

(b) Pollution of underground water: regional co-operation in the study, management and protection of underground pollution, especially in areas where recharge sources cut across political borders, is of great priority. As a matter of fact, there is no alternative to regional co-operation if such problems are to be properly addressed and solved. Other sources of pollution of underground water in country A. could be in country B. and/or in country C. Regional co-operation in solving such problems under the conditions of the ECWA region is imperative.

(c) Pollution of river basins: several rivers in the region travel through the political borders of more than one country. The case for the utilization of underground water could be made here and promoted.

(d) Management of wildlife resources: plant ecosystems as well as animal wildlife is another area in which co-operative research programmes are essential and should be promoted.

4.5 Programmes identified for follow-up. Some of the programmes identified as urgently needed by member countries in institution-building for environmental protection are:

(a) Training of manpower: programmes to train manpower in analytical methods and techniques of pollutants in water, air, food and wastes are urgently needed by the majority of countries of the region;

(b) Regional research programmes and exchange of information networks on development of environmental standards;

(c) Conferences and workshops to consider institution-building issues of environmental protection. Workshops should articulate the economics of establishing environmental protection institutions, the concepts of differentiating functions of environmental protection from other functions dealing with natural resources and the determination of priorities in various environmental protection services.

Annex I

INSTITUTIONS VISITED AND PEOPLE MET IN COUNTRY VISITS TO STUDY THE STRENGTHENING OF ENVIRONMENTAL CAPABILITIES OF THE COUNTRIES OF THE ECWA REGION

1. Saudi Arabia:

(a) Meteorology and Environmental Protection Administration (MEPA), P.O.Box 1358, Jedda, Saudi Arabia.

(i) Mr. Abdel Wahab Dakak: Director of Natural Resources, MEPA;

(ii) Mr. Ibrahim Zeitoun: General Consultant, General Directorate of Environmental Protection, MEPA.

(b) Gulf Co-operation Council (GCC). General Secretariat, P.O. Box 4493, Riyadh, Saudi Arabia.

(i) Mr. Abdullah Abadi: Director General, Man and Environment Affairs Division;

(ii) Mr. Mohammed Hamdan: Deputy Director General, Man and Environment Affairs Division;

(iii) Mr. Abdul-Latif Al-Mugrin: Director, Agriculture and Water Department, Economic Affairs Division.

(c) Arab Bureau of Education for the Gulf States, P.O. Box 3908, Riyadh, Sadui Arabia.

(i) Mr. Mohammed Rasheed: Director General.

(d) Regional Agricultural and Water Resources Centre, Ministry of Agriculture and Water, Riyadh, Saudi Arabia.

(i) Mr. Salah Abu Shagra: Technical Director;

(ii) Mr. Gassan Hamdallah: Director, Soil Fertility.

2. Yemen Arab Republic:

(a) United Nations Development Programme, Sana'a.

(i) Mr. Andreas Henkel: UNIDO officer, also in charge of UNEP affairs.

(b) General Directorate of Environmental Health, Ministry of Municipalities and Housing, Sana'a.

(i) Mr. Ismael Qasem Eltor: Director General.

(c) University of Sana'a, Sana'a.

(i) Mr. Abu Baker El-Qurba: Vice President of the University;

(ii) Gaber Hajaj: Faculty of Science, Zoology.

3. Kuwait:

(a) Department of Environmental Protection, Ministry of Health, Kuwait

(i) Mr. Mugrin El-Shalal: Director.

(b) UNEP office in Kuwait.

(i) Mr. Rouhi Sharif: UNEP representative.

(c) Regional Organization for the Protection of the Marine Environment (ROPME), P.O.Box 26388, Safat, Kuwait.

(i) Mr. Abdel-Latif Zeidan: Co-ordinator of plan of action and Director of Programmes;

(ii) Mr. Laith Qassab: Expert on environmental engineering.

(d) Kuwait Institute for Scientific Research, P.O.Box 24885, Safat, Kuwait.

(i) Mr. Ibrahim Hamdan: Director, Division of Food Resources Research;

(ii) Mr. Faisal Taha: Division of Environmental Research.

Annex II

PROGRAMMES ON THE ROLE OF YOUTH IN ENVIRONMENTAL PROBLEMS IN EGYPT

Role of youth in environmental problems

Since the youth sector is considered one of the biggest sectors of society in number and in production, and because of the deep interest in youth problems, different groups of youth established offices that are interested in their problems such as:

Youth and Sciences - Kakaziek University:

It was established under the auspices of the university president.

A quarterly magazine which includes some environmental activities in the Zakaziek governorate is issued.

An international conference was held at Zakaziek University about pollution of agricultural soil in which groups of specialized Egyptian scientists as well as world scientists participated.

They stressed the importance of the relation of good agricultural soil to food security, the necessity of preserving land from degradation and the use of insecticides against agricultural pests.

Azhar youth and environment

The Azhar youth believe in collective work and integration of ideas to achieve their goals; they used modern methods in approaching the environmental problems of their rural society. They formed caravans, each including hundreds of graduates representing different professions in the fields of medicine, engineering and social and economic professionals. Each of these graduates will be in charge of a certain village for the dissmination of public awareness of the different fields of environmental life in the village such as: family planning, Bilharzia, polygamy many other problems facing the village.

In addition to this, youth groups undertook a social survey that included all family, society and environmental aspects, collecting data on toxic or chemical substances used by the rural inhabitants.

This included:

- studying the human settlements areas;

- Studying the environmental cause of diseases;

- Finding out the sources of water pollution;

- Registration of existing wildlife (animals and plants);

- Recognizing the beneficial effects of industrialization on the rural society;

- Practical application of the suitable technological alternatives for the village which the inhabitants are trained to use;

- Studying methods and alternatives of getting energy using cheap scientific means;

- Studying the posibility of environmental conservation against natural disasters.

The Arab Office of Youth and Environment:

Al.ram corporation and Ahram Science clubs are hosting the office and help it in its work and activities. The office was established at the end of 1978 as an Egyptian non-governmental organization concerned with the environment and its problems.

There are about 900 members located in different governorates and in multidisciplines; some of them are students and others are graduates. The office will extend its activities to various governorates through youth and environment committees in each governorate. These committees will work on solving governorate environmental problems and participating in various activities at local level.

The main objectives are to draw the attention of Egyptian youth to the importance of the environment in relation to the development of their country and to factors affecting their future. The other objectives of the office include:

1. The environmental education programme for secondary school students was carried out in 1978-1979 in different secondary schools in Cairo. The programme included a series of lectures, seminars, scientific visits and environmental film presentations. Youth groups concerned with the environment were formed in these secondary schools and now they are working actively and successfully.

2. Members participate in youth camps and training courses which enhance experience with the elements of the Egyptian environment besides the field studies which provide information for the publication of scientific reports on different environmental issues.

3. In 1979, a project of training courses in different governorates in Egypt was supported by UNESCO and its National Commission in Egypt, to create youth leaders in the field of local environmental activities (this project was supervised by Mr. M. A. El-Kassas).

4. There is an ongoing programme which aims at protecting and recultivating parks and green areas in Cairo.

5. A programme was organized in co-operation with the National Academy of Scientific Research and Technology about the World Environment Day in the years 1980 and 1981.

6. In 1980 the office joined the International Youth Federation for Environmental Studies and Conservation (IYF) and has shared in all or most of the activities of the group since that year as well as of others such as the use of media in Environmental Education (October 1981 - Strasbourg) and the United Nations Conference on New and Renewable Sources of Energy (August 1981-Nairobi).

7. In June 1981, the African Youth Seminar on Environment was organized in Cairo to co-ordinate activities of African young people including conservation activities. Twelve African countries were represented at this seminar.

The preservation of environment is a task worthy of the time and attention of each of us. The members of the Arab Office of Youth and Environment attempt to take part in this task to safeguard their land and future.

The co-operation between National Commission for UNESCO and the youth sector

1. Environmental education project for youth

The youth sector is considered one of the biggest and the most vital sectors of society as it has already been capable of absorption and production and it is always concerned with the future.

Therefore, environmental education for youth through means of formal and informal education is considered the seed for forming the broad basis of people's support for decisions and for policy-makers' sensitivity to the preservation of environment.

Being aware of the importance of this direction in realizing the goal of preserving human environment, an agreement has been implemented between the Egyptian National Commission for UNESCO and UNESCO to carry out this pilot project in Egypt. In appreciation of the role played by the Arab Office of Youth and Environment (Science Clubs of Al-Ahram) in this field, the

National Commission has entrusted it with the plan of carrying out this project and will give all necessary help.

The intent of this project was to organize five seminar workshops divided into groups numbering between 25 to 30 youths chosen from five different governorates of the Republic.

These groups are to be acquainted with the environmental problems in each governorate, and urged to discuss these problems, seeking solutions, after being supplied with sufficient information concerning ecology. This will be followed by a general strategy derived from the experience gained during the carrying out of the project, the aim of which is to increase youth awareness of environment throughout the republic in addition to setting up programmes to follow up the performance of this strategy in order to create awareness in the new generations about environmental problems and an eagerness to exert all efforts for preservation and development.

Financial resources

UNESCO allowed $15,000, the National Commission for UNESCO provided L.E. 1,000, the Academy of Scientific Research and Technology provided a grant of L.E. 2,000. Four governorates (Alexandria, Monoufia Suez and Cairo) provided a sum of L.E. 5,228. Some other local authorities provided financial support and in-kind contributions.

Objectives of the project

The project was aimed at:

(1) Sensitizing youth to environmental problems in each governorate;

(2) Exploring the role of youth in environmental education of the public and protection of the environment.

Implementation of the project

A steering committee was organized representing the two co-operating bodies plus a number of education and information experts.

The steering committee set the general outline of the technical content (topics) to be covered in each symposium. This comprised a background part that was common in all four symposia and a specific part that pertained to habitat conditions in each governorate. The committee invited some 30 experts (university staff, environmental research workers, social research workers, medical research workers and media experts) to contribute discussion papers in the symposia.

The project envisaged the holding of five symposia in five governorates, but in practice only four (Alexandria, Monoufia, Suez and Cairo) were held.

Time did not allow for the Aswan symposium.

Results obtained

1. The Alexandria Symposium (19-24 January 1980).

The symposium was attended by 70 participants, mostly youth leaders from the University of Alexandria, women's organizations, political - party groups. The symposium discussed in plenary 23 topics, each presented in a lecture form followed by an open discussion; in working groups an analysis and evaluation of an opinion survey was carried out prior to the symposium.

The recommendations of the symposium were endorsed by the governor and implementation included:

(a) Establishment of a permanent group to maintain concern and interest in environmental issues and monitor the implementation of these recommendations;

(b) A summer environmental education course was set in the Abou-Quir suburb of Alexandria (21-29 September 1980) attended by 120 youth of both sexes;

(c) A number of environment projects were approved for implementation through youth work.

2. The Monoufia Symposium: (16-21 March 1980)

The symposium was held in Shebin el Koum (venue: the Nile Centre for Information). It was attended by 60 participants representing a mix of young students and members of youth organizations and a number of senior officials in various departments of the local government. The symposium discussed 18 topics presented as lectures followed by plenary discussions; it included field visits to industrial centres (textile) and social development projects. The recommendations included outlines of a number of projects for the enhancement of the rural environment. These included in particular a tree-planning project covering all the governorate. This project is now being implemented.

A follow-up committee chaired by the Governor was established with the purpose of (1) maintaining interest in environmental education of the public and (2) implementing the recommendations of the symposium.

3. The Suez Symposium (27 November - 4 December 1980)

This symposium was held in the centre of oil industry in Egypt (refineries, transport, etc.,). Industry provided support and was involved in the symposium. Seventy-five participants joined the symposium. The symposium discussed 12 principal topics with special stress on environmental aspects of the oil industry, marine resources and coastal pollution.

Several field visits were made to industrial sites and coastal areas including the port of Suez. The Nasr Oil Company staged a special exhibit.

Recommendations, including those proposing five field projects for enhancement of the environment in the Suez area, were supported by the governor. The five projects were concerned with environmental education for the public in the Suez area, a youth programme for combating pollution (cleaning) in the city of Suez (implementation began in January 1981), the youth role in enhancing the environmental quality of the city of Suez, a tree-planting project, and the promotion of environmental science in youth clubs and in schools.

The Cairo Symposium (24-30 December 1980)

The symposium was attended by 85 participants representing youth groups from various parts of the city. Plenary discussions included 15 topics (presented as lecture followed by open discussions). Field visits to the Helwan industrial area and to the outskirts and centre of the city were led by environmental experts. Recommendations and follow-up projects were numerous. In response, the governor established a standing committee "The Youth Committee for Protection of the Environment" to monitor and follow up these recommendations and project proposals.

General comments

1. The local authorities in the four governments actively supported and participated in the activities, and requests were received from other governorates to hold similar symposia.

2. The enthusiasm of the participating youth was very encouraging and they responded by thinking about field activity programmes to enhance their environment.

3. Each symposium initiated follow-up action and permanent groups of youth and environment were established.

4. Recommendations comprised outlining of programmes of actions were discussed with the local authorities.

5. Implementation was immediately started in certain areas, e.g. Alexandria.

6. The series of symposia provided the media with ideas and materials. The film that was made as part of the project was presented on the national television.

7. Experts and consultants who were invited to deliver lectures or lead discussions showed great interest, which has become an asset to the environmental movement in Egypt.

Recommendations

The series of symposia held within the framework of this the pilot project showed that there was a need for a continuous effort in the field, and hence a need for a permanent organ to extend activities all over Egypt and to keep them on a continuous basis. The committees that were established in the governorates would need the technical support of a group that would provide information on a continuous basis.

Youth organizations (group clubs) need to be further helped and encouraged to maintain interest in environmental activities. Experiences in several areas, especially in Alexandria, showed the valuable potential that youth groups represent, especially during the summer vacations. Youth work camps could be a very useful tool.

Prospects

The project, and its four symposia, have no doubt stirred wide interest in the issues of the environment.

The follow-up will require a parent body to provide means (financial, administrative and technical) for the continuation of this type of activity. This aspect is now being discussed in the MAB National Committee and in the technical secretariat of the Ministerial Committee for Environmental Affairs.

The four educational modules built up on bases of the symposium will be published and made available to youth groups in various governorates of Egypt and to media and education authorities.

Annex III

SCIENTIFIC SOCIETIES, GOVERNMENTAL COUNCILS AND COMMITTEES WHICH ARE RELATED TO ENVIRONMENTAL INFORMATION, CO-ORDINATION AND/OR RESEARCH IN EGYPT

Scientific Societies

1. Egyptian Geographical Society (established in 1875)
   The Garden of the Ministries of Irrigation and Transportation
   Kasr El-Eini St., Cairo.

2. Egyptian Society for Entomology (established in 1907)
   14, Ramsis St.
   P.O.Box 430, Cairo.

3. The Society for the Graduates of Agriculture Institutes (established in 1918)
   Building of the Syndicate for Agriculture Professionals
   Galaa St., Cairo.

4. The Egyptian Medical Society (established in 1919)
   Dar El-Hekma
   42, Kasr El-Eini St., Cairo.

5. Society of the Egyptian Engineers (established in 1919)
   48, Ramsis St., Cairo.

6. The Egyptian Public Health Association (established in 1926)
   31a, July 26 St., (Shousha Building), Cairo.

7. The Zoological Egyptian Society (established in 1927)
   The Zoo Garden, Giza.
   also
   The Club for Animal Friends
   (Same Address).

8. The Egyptian Convention for Scientific Culture (established in 1930).
   1, Ozoris St., (Tager Building)
   Garden City, Cairo

9. The Egyptian Society for Soil Sciences (established in 1952).
   Faculty of Agriculture
   Ein Shams University
   Shubra El-Kheima, Cairo.

10. The Geological Egyptian Society (established in 1952)
1, Ozoris St., (Tager Building)
Garden City, Cairo.

11. The Botanical Egyptian Society (established in 1956)
1, Ozoris St., (Tager Building)
Garden City, Cairo.

12. The Plant Disease Society (established in 1966)
1, Ozoris St., (Tager Building)
Garden City, Cairo.

13. The Egyptian Society for the Conservation of Natural Resources (established in 1975)
The Zoo Garden, Giza.

14. The Egyptian Society for Environmental Sciences (established in 1975)
1, Ozoris St., (Tager Building)
Garden City, Cairo.

15. The Egyptian Society for Medicine and Law (established in 1978)
Alexandria University,
Shatbi, Alexandria.

16. The Society for the Conservation of Nature Beauty (established in 1978)
Building of the Syndicate for Agriculture Professionals,
Galaa St., Cairo.

17. The Society for Tree Lovers (established in 1978)
Maadi, Cairo.

18. The Arab Office for Youth and Environment (established in 1978)
The Sciences Club
Al-Ahram newspaper,
Galaa St., Cairo.

19. The Egyptian Scientific Society for Historical Culture and Antiquities (established in 1979)
1, Ozoris St., (Tager Building)
Garden City, Cairo.

Governmental Councils and Committees

1. The Environmental Research Council (established in 1971).
The Academy for Scientific Research and Technology
101, Kasr El-Eini St., Cairo.

2. The National Committee for SCOPE
The Academy for Scientific Research and Technology
101, Kasr El-Eini St., Cairo.

3. The National Committee for IUCN
The Academy for Scientific Research and Technology
101, Kasr El-Eini St., Cairo.

4. The National Committee for IHP
The Academy for Scientific Research and Technology
101, Kasr El-Eini St., Cairo.

5. The National Committee for Confrontation of Desertification
The Academy for Scientific Research and Technology
101, Kasr El-Eini St., Cairo.

6. The Committee for Shore Protection
The Academy for Scientific Research and Technology
101, Kasr El-Eini St., Cairo

7. The National Committee for MAB
17, Ismail Abu El-Fotouh St.,
Dokki, Giza.

8. The Supreme Committee for the Protection of Air from Pollution
The Ministry of Health, Cairo.

9. The Permanent Committee for the Protection of Sea Water from Oil Pollution
The Ministry of Defence and War Production, Cairo.

10. The Executive Office for the Protection of Wildlife
The Ministry of Agriculture
Dokki, Giza.

Annex IV

FIVE-YEAR ENVIRONMENTAL RESEARCH PLAN IN EGYPT (1983-1987)
ENVIRONMENTAL RESEARCH COUNCIL

1. Development of technologies for drinking water treatment:

   Objectives: (a) Survey of type and quantity of pollutants in drinking water sources;
   (b) Identification of suitable technologies for water treatment to attain required levels of purity and the development of presently used technologies to improve its efficiency.

2. Development of technologies for treatment of liquid industrial waters:

   Objectives: (a) Evaluation of efficiency of physical, chemical and biological processes used in treatment of liquid industrial waters with a view to identifying appropriate ones;
   (b) Preparation of pilot models for treatment units which can be manufactured locally;
   (c) Feasibility study of recovery of wastes and their reuse;
   (d) Production of new pilot models for water recycling and its use in industry;
   (e) Establish data-base bank on industrial pollutants and their composition for utilization in the development of pollutant standards to be followed in industrial firms in Egypt.

3. Water recycling for agricultural utilization:

   Objectives: To determine optimal methods for waste-water recycling of industry and sewage for future use in irrigation and especially in new production and resettlement areas.

4. Diseases associated with work:

   Objectives: To study the frequency of occurence of occupational diseases in different industries. The study covers noise at work, temperature, moisture and chemical poisoning.

5. Study of enzymatic changes in man that are associated with biocides and other pollutants:

Objectives: To define the natural level of blood enzymes which could be affected by biocides and other pollutants. The aim is to set up basic comparable standards to recognize defect cases.

6. Survey of occupational hazards of different industries on the national level:

Objectives: (a) To define the different industries in Egypt, the different chemicals used in them and the hazards of each of these industries on the workers who are exposed to them;
(b) To set up a data bank of chemical pollutants used in different Egyptian industrial fields.

7. Research of natural resources environment.
Environmental map of potential natural resources:

Objectives: To lay down localities, quantities, and qualities of known natural resources and to classify priorities of their development, protection and best methods of treatment against any negative side-effect resulting from their utilization for the public welfare.

8. Evaluation of deterioration of irrigated land production owing to environmental pollution factors:

Objectives: To evaluate the irrigated land production deterioration caused by environmental pollution factors, and to investigate the best ways to avoid and limit the deterioration.

9. Studies to establish a national network of natural reserves and a national data bank of genetic resources:

Objectives: (a) Construction of a national network of natural reserves in forestland and seas;
(b) Establishment of a national data bank of genetic resources.

10. Soil environment research.

Investigation of development and support of environment education programmes at all education levels with application tests:

Objectives: Support and development of environmental educational programmes at all levels of levels of public education. Preparation and application of new programmes.

11. Studies on environmental science related to educational programme at university and teacher training schools levels to develop and upgrade these programmes.

Objectives: To define the environmental science-related educational programmes in the different institutions of higher education in order to support and upgrade them.

12. Field of studies in environmental mathematical models, environmental information, environmental economics, environmental legislation and social studies related to the environment.

Suggested studies:

(a) Solid waste disposal and management;
(b) Erosion, sand movement and desertification;
(c) Environmental studies of the side-effects of the Kattara basin project;
(d) Preparation of legislation concerning the environmental impact of developmental projects.

Annex V

KUWAIT LAW FOR PROTECTION OF ENVIRONMENT
IN THE NAME OF GOD THE COMPASSIONATE THE MERCIFUL

DECREE LAW NO. 62 FOR THE YEAR 1980
REGARDING PROTECTION OF THE ENVIRONMENT.

After review of the Amiri Order of the 4th of Ramadhan, the Hijrah Year 1396, corresponding to 29 August of 1976 A.D. amending the constitution and Articles 15, 16 and 21 of the constitution and without prejudice to

- Law No. 12 for the year 1964 regarding protection of navigable waters from oil pollution, and the amending laws.
- Law No. 32 for the year 1965 regarding the promulgation of the industry.
- Law No. 32 for the year 1969 regarding licensing commercial stores.
- Law No. 15 for the year 1972 regarding Municipality and the amending laws.
- Law No. 19 for the year 1973 regarding conservation of the oil resources.
- Law No. 131 for the year 1977 regulating the use of ionizng radiation and protection from its hazards.

Based on the recommendation by the Minister of Public Health, and after the approval of the Council of Ministers, we promulgated this Law, the text of which reads as follows

ARTICLE 1

In applying the provisions of this law and the decrees and orders putting it into force, the following terms shall bear the meaning explained thereunder:

1. Environment

(Means) the biosphere including man, animal, and plant together with all the surroundings, air, water, soil, and what they contain in the form of solid liquid, gas or radiation plus fixed or mobile structure built by man.

2. Polluting materials and factors.

(Means) any solids, liquids, gases, fumes, vapours, odours,noise, radiation, heat, glare and vibrations made by man, which may directly or indirectly cause pollution of the environment.

3. Environment Pollution

(Means) the presence in the environment of any polluting material or factor in a concentration or a level for a period of time, that might lead directly or indirectly, either alone, in combination or through interaction with other factors, to threaten public health or in any way interfere with healthy life and making good use of property.

4. Environment Protection

(Means) prevent pollution or minimise its effect, or combat it and take whatever measures for the protection of the environment.

ARTICLE 2

A council for environment protection shall be formed chaired by the Minister of Public Health and with membership of representatives of the following ministeries and organizations:

1. Ministry of Public Works
2. Ministry of Commerce and Industry
3. Ministry of Planning
4. Ministry of Interior
5. Ministry of Public Health
6. Ministry of Electricity and water
7. Ministry of Communications
8. Ministry of Oil
9. Kuwait Municipality
10. The Directorate General of Shuaiba Industrial Area
11. Kuwait Institute for Scientific Research.

The Minister or the Head of the Department concerned shall nominate the representative of the Ministry or Department, the rank of the member will not be lower than Assistant Under-Secretary or the equivalent.

The council shall have the right to add other members.

The Council shall make the necessary regulations for the organization of its work and decision making procedures.

The Council shall have the right to form permanent subcommittees or specialized task forces to study subjects falling within its jurisdiction, or seek appropriate advice from local and international experts.

The Council shall have the right to delegate some of its authorities to sub-committees or to any other party.

ARTICLE 3

The Environment Protection Council shall have the following duties:

1. Suggest a general policy for the protection of the environment, including appropriate scientific and health standards for residential areas, industrial and urban developments and exploitation of natural resources in a way that insures the safety of all premises and working population and the protection of the environment in general.

2. Suggest short and long term integrated work plans concerning all activities related to protection of the environment, train domestic groups from various state institutions and private sector in ways and means of protecting the environment and supervise the implementation of the work plan by the executive bodies concerned.

3. Coordination of the activities of the different departments concerned with the protection of the environment, supervise and evaluate their activities in this field, and prepare an annual report about the state of the environment in the country.

4. Study problems resulting from pollution or deterioration of the environment and suggest the appropriate control measure.

5. Participate in formulating the research policy in the field of environment protection in coordination with concerned organizations.

6. Prepare bills, regulations, and orders for protection of the environment and supervise their enforcement.

7. Study regional or international agreements or conventions related to environmental affairs and decide in coordination with the departments concerned whether or not to ratify them.

8. Advise on the relations between Kuwait and the regional and international organizations concerned with the protection of the environment.

9. Set the general framework for environment education and programmes aiming at public education and encouraging citizens as groups or individuals, to take part in protecting the environment.

10. Suggest an annual budget to cover its expenses.

ARTICLE 4

The Chairman of the Environment Protection Council shall establish a department within his Ministry to assist the Council in carrying out its task and follow up the enforcement of its orders and recommendations.

The department chosen shall discharge whatever environmental protection duties assigned to it, in cooperation with the other departments concerned. The department may set up monitoring stations or check points at selected sites as required for protection of the environment. It may also cooperate in this task with the department concerned.

ARTICLE 5

Upon the recommendations of the Environment Protection Council decrees shall be issued regarding whatever regulations and conditions required for the construction of any factory of establishment, production of material, carrying out any activity or running an operation that may pollute the environment.

In case of violations of these regulations and conditions, the council may request the withdrawal of the licenses issued for the violating installations or activities without prejudice to the penalties specified in Article 11 of this law.

ARTICLE 6

The implementation of this law shall not interfere with the provisions of the Law No. 12 for the year 1964 regarding the prevention of polluting navigable waters by oil, or Law No.19 for the year 1973 regarding the conservation of the oil resources, or Law No. 131 for the year 1977 regulating the use of ionizing radiation and protection from its hazards, or any other law concerned with the protection of specific aspects of the environment.

However, authorities enforcing the above mentioned laws, or any other departments authorized to issue regulations, orders or conditions related to environment protection, shall consult the Environment Protection Council before issuing such regulations, orders or conditions.

The department referred to in Article 4 shall under the supervision of the Environment Protection Council, take the necessary steps to coordinate the work of the departments concerned with protection of the environment and ensure their cooperation in the fields of work.

ARTICLE 7

The Environment Protection Council shall order the suspension of work in any institution or ban the use of any tool, machine or material either partially or totally, if they invlove any hazard to the environment. The suspension will be for a week and may be extended for another week if absolutely necessay.

The Council shall have the right to authorize its chairman to issue such an order in case of an emergency and for a period no longer than three days, after which the case shall be presented to the Council.

The administrative departments and authorities concerned shall be obliged to carry out the suspension order and the Council may order certain procedures to be carried out during the suspension period.

Should the Council consider it necessary to extend the suspension beyond the period described in Para (1) it may request the supreme court to issue an order enforcing the suspension permanently or temporaily. The institutions affected may appeal the decision before the Supereme Court, and pursue its case through legal channels.

ARTICLE 8

In exemption from the provisions of Article 7, violations by governmental establishments or companies in which the government has a share of more than 50% shall be considered by a special committee comprising the Chairman of the Environment Protection Council and the Ministers of Oil, Commerce and Industry, and Electricity and Water. This committee shall decide what measures to be taken.

ARTICLE 9

The Chairman of the Environment Protection Council shall nominate a number of Environment Protection Inspectors required by this law. They will be given the responsibility of enforcing the provisions of this law and report any violations thereof. The Inspectors shall have the right to enter into any violating institutions, make legal suits, take specimens, and conduct studies and measurements to specify the extent of environmental pollution, identify the sources of pollution and ensure the application of regulations and conditions regarding environmental protection.

They may seek assistance of the police if necessary.

ARTICLE 10

The Environment Protection Council shall have the right to request any information it may deem necessary from any institution carrying out activities that may pollute the environment.

ARTICLE 11

Without prejudice to any harsh penalty specified by any other law any violation of regulations and conditions as described in Article 5 or of suspension orders as specified by Article 7 of this law, shall be punished by imprisonment for a term no longer than three years and a fine of not more than K.D.10,000 - (Kuwait Dinars Ten Thousand). The court may also order confiscation of material or closure of places to prevent pollution for a maximum period of three months. Any further violation may be punished by a court order declaring the license void.

Whoever obstructs authorized personnel from discharging their duties as a specified in this law shall be punished by imprisonment for a maximum term of one year, and a fine of not more than One Thousand Dinars, or either one of these penalties.

Violation of Article 10 of this law shall be punished by imprisonment for a maximum term of six months and maximum fine of Five Hundred Dinars or either one of these penalties.

ARTICLE 12

The Minister of public Health shall issue the necessary orders putting this law into effect.

ARTICLE 13

Ministers, each within his jurisdiction. Shall carry out this law as of the date of its publication in the official gazette.

JABER AHMED AL-SABAH
AMIR OF KUWAIT

SAAD ABDULLAH AL-SABAH
PRIME MINISTER

Annex VI

MINISTERIAL ORDER ON THE ESTABLISHMENT AND ORGANIZATION OF ENVIRONMENT PROTECTION DEPARTMENT IN THE MINISTRY OF HEALTH, KUWAIT

IN THE NAME OF GOD THE COMPASSIONATE THE MERCIFUL

STATE OF KUWAIT
MINISTRY OF PUBLIC HEALTH

Reference: Sein Ein 43/1-8706

Date: 13 Dhu Al-Hijja 1400
23 October 1980

Ministrial Order No. 389/80
Establishing the Environment Protection Department

The Minister of Public Health

-- after review of the Decree law No. 62 for the year 1980 regarding the protection of the environment, the Ministerial Order No. 111/75 reorganizing the technical departments of the Ministry of Public Health, the Ministerial Order No. 153/75 organizing the Occupational Health and Industrial Pollution Control Section, and the Ministerial Order No. 279/77 regarding the Department of Public Health and Planning,

-- and in view of the progressive industrialization, and the public health environmental impact that may result thereof,

-- and so as to establish the technical administration concerned with the implementation of the protection of the environment in accordance with the provisions of law No. 62/80,

Decrees the following:

Article One

A new department shall be established within the Ministry of Public Health to be called Environment Protection Department. The Director in charge will report directly to the Minister.

Article Two

The new department shall be concerned with discharging the duties of the Environment Protection Council and will follow up its instructions and recommendations in accordance with Article 4 of the Decree Law No. 62/80 regarding protection of the environment.

Article Three

The Environment Protection Department shall be concerned with the control of the environment from the effects arising from industrial urban development and other forms of development, through the study of existing installations and projects, and their possible impacts on the environment, particularly the residential and coastal areas. It will be concerned with setting up the requirements and standards necessary to curb their effects or prevent them and preserve the environment of Kuwait to insure a perfect, healthy life, and a safe environment.

To achieve this, the department shall:

1. discharge all the duties for the Environment Protection law and orders and recommendations issued by the Environment Protection Council in cooperation and coordination with other organizations concerned,

2. prepare standards, specifications and conditions for the new industrial and urban projects to insure curbing of pollutants and preventing any change in the natural characteristics of the environment that might affect the citizens' health, their properties or environmental balance,

3. study industrial and urban projects to insure their compliance with the specifications and conditions mentioned in clause 2 above.

4. coordinate work of the various organizations concerned to insure protection of the environment, and set up the necessary monitoring stations in order to identify environmental pollution, the level thereof, and their impact on the environment and human health and interests,

5. Formulate a plan to train the technical staff of the government and private sector installations in ways and means of protection of the environment and prepare the necessary programmes to implement this plan and supervise its implementation in cooperation with other organizations concerned,

6. Establish programmes for public education and information and supervise their implementation in cooperation with other organizations concerned.

Article Four

The Environment Protection Department shall be supervised by a panel consisting of:

1. The Department Director
2. The Technical Advisor
3. The Deputy Department Director
4. The Superintendents
5. The Heads of Sections and Units

Article Five

The responsibilities and duties of the Department Director shall be:

1. Running the technical and administrative responsibilities assigned to the department and its division.

2. The preparation of work plans for the department and running the technical, administrative and financial aspects thereof.

3. Evaluate the annual proficiency reports for the departments employees, prepared by their immediate supervisors, and the scheduling of their annual leaves.

4. Advise on the annual budget and requirements of installation, personnel and equipment.

5. The preparation of annual and periodic reports on the department's activities.

Article Six

The Technical Advisor shall be the technical reference for the department. His duties will include:

1. Advise the Department Director in the technical matters.

2. Prepare the required investigations in the field of protection of the environment in coordination with the specialized scientific centers.

3. Supervise research work related to protection of the environment and follow up the implementation of the approved plans in this respect, evaluate the results and eliminate emerging difficulties in cooperation and coordination with the concerned specialized authorities.

Article Seven

The Deputy Department Director shall assist the Department Director in whatever work assigned to him by the Director, and act as Director in his absence. He will also serve as Secretary of the Environment Protection Council. The department shall provide him with a staff for the technical secretariat of the Council in order to discharge the following duties:

1. Prepare the agenda and documents for the meetings of the Council and perform secretarial duties during these meetings, keep minutes for the Council's meetings for the daughter committees.

2. Follow up the implementation of the Council's decisions and prepare notes regarding what was carried out, in cooperation with the Coordination and Follow-up Superintendent at the Environment protection Department.

Article Eight

The Superintendent shall be concerned with technical and administrative responsibilities of his office and its divisions. He shall present the Department Director with annual and periodic reports on the activities of his office, schedule the annual leaves for his staff and prepare their proficiency reports and send them to the Department Director.

Article Nine

The head of Section shall report to the Superintendent for the duties assigned to the section. He shall undertake the technical and administrative supervision of the section's duties and control of personnel, schedule his employees' annual leaves and provide the Superintendent with annual and periodic reports on his section and employees' activities.

Article Ten

The head of Unit shall report directly to the Department Director. He shall undertake technical and administrative supervision of the unit's work and schedule its employees' annual leaves as well as prepare annual and periodic reports on the units activities and requirements and present them to the Department Director.

Article Eleven

The following superintendency shall be under the Environment Protection Department:

Firstly: superintendent for Coordination and Follow-up:

This office shall carry out coordination work among the authorities concerned with the protection of the environment, in addition to preparing both a plan for the training of the units which will work in the field of protection of the environment and the educational programmes needed. The contro office shall include the following two Sections:

1. The Section of Coordination and Follow-up, which shall carry out the following:

   a. co-operate with the Secretariat of the Environment Protection Council in the follow up and implementation of the decisions of the Council,

   b. study programmes and work plans suggested by the other authorities concerned with the protection of the environment,

   c. coordinate and follow up the implementation of the projects and work plans for the protection of the environment, and prepare the required progress reports,

   d. follow up the implementation of the national plan for the prevention of accidental marine oil pollution and prepare progress reports in this area, in cooperation with the national authorities concerned,

   e. cooperate with the Kuwaiti Center for the Protection of Marine Environment and coordinate the Centre's work with other authorities working in this field,

   f. follow-up and evaluate the activities of the other authorities concerned with the protection of the environment,

   g. prepare an annual report on the environmental situation in the State, in cooperation with the Environment Protection Superintendent and the authorities concerned.

2. The Section for Training and Environmental information shall carry out the following:

a. set up plans for training of local groups within the state institutions and the establishment of joint and private sectors, concerning ways and means of protection of the environment,

b. develop training programmes and organize training within the Department, or participate in the training programmes carried out by the authorities concerned,

c. follow up the implementation of training programmes concerning protection of the environment which are being carried out by the various authorities and evaluate the outcome of such programmes,

d. maintain contacts with the concerned authorities to make sure that educational curricula, in all levels, include enough information to make the students aware of the measures that are being taken for protection of the environment,

e. set up training regulations for specialized educational institutions and recommend grants and scholarships and make use of scholarships granted by international organizations,

f. publish informative bulletins on protection of the environment through the information media,

g. prepare periodic reports about the activities and achievements of the Department,

h. provide scientific references and documents, maintain contacts with the various sources of information and set up a system to brief those working in the field of protection fo the environment on the results of current scientific research inside Kuwait and abroad,

i. hold a scientific semilar once a year to discuss research and study documents presented by the authorities concerned with protection of the environment and publish a yearly book on the seminar.

Secondly: Environmental Pollution Control Office

This office shall carry out technical work regarding maintenance of the environment in Kuwait, establish and operate environmental monitoring stations, conduct scientific research and studies in cooperation with the other offices in the Department and the other authorities concerned to determine the state of the environment and the degree of effectiveness of the various protection measures. The office shall include the following sections:

1. The Environment-Impact Assessment Section

This section shall prepare emission standards to insure protection of the environment. It shall prepare environment-impact studies for projects owned by the State or the private sector and review standards regarding the environment prepared for the proposed projects before licensing their installation. The duties of the section will include in particular:

a. advice of suitability of the project locations,

b. the allowed types and quantities of air and water pollutants resulting from the industrial project, and solid waste resulting from plant operations,

c. impact of different projects on the environment at large and compare the projects' potential benefits against possible long-term environmental damage.

d. advise of the available means and measures for curbing the impact of such projects on the environment, in coordination with the authorities responsible for the approval of the projects, or for their licensing,

d. cooperate with other sections of the Department in follow up of the industrial and economic projects to insure their compliance with the measures for the protection of the environment.

2. The Air Pollution Control Section, which shall carry out the following:

a. investigate the concentration of gas and other air pollutants such as dust, pollens, fungi and microorganisms, the extent of their dissemination and their health impacts,

b. study climatic conditions prevailing in the working environment and outdoors to determine the effects on health, and human resistance to other environmental stresses.

c. study the noise level originating from the various activities and determine their effects on health.

3. The water and soil pollution control section which shall carry out the following:

a. investigate the level of pollutants resulting from the discharge of industrial and domestic water into the Gulf, and pollutants resulting from other sources such as navigation, or carried by water currents to Kuwaiti territorial waters,

b. study the concentration of pollutants in fish and other marine organisms of economic value,

c. investigate the physical, chemical and biological specifications of drinking water and its compatibility with international standards at the source and consumer,

d. advise on the control of water pollution,

e. combat soil pollution and dispose of industrial waste through the following means:

- study of the specifications of the underground water to make sure that it is pollution free,

- advise on the optional ways to dispose of industrial waste, and

- supervise the desert mining operations.

Thirdly: Office of Occupational Health and Work Environment,

This office shall be charged with insuring safe and healthy work conditions, promote productivity, improve performance, reduce fatigue and promote health care.

The office shall include 2 sections:

a. The Occupational Health Section, which shall carry out the following:

1. provide health services,

2. set standards for physiological and psychological fitness,

3. conduct medical checkups and lab tests to insure workers' physical fitness at all times,

4. revise disability rates resulting from work accidents and diseases,

5. investigate the causes of occupational diseases and work injuries and set up conditions for the protection of the workers,

6. investigate the nature of work in government institutions to determine its potential risk,

7. participate in training in occupational health,

8. cooperate with the work Environment Section in factory inspection.

b. Work Environment Section, which shall carry out the following:

1. factory inspection to make sure compliance with the requirements of ventilation, lighting, sanitary facilities and protective equipment,

2. study the work environment and assess the level of heat, noise and other health hazards,

3. take samples of the raw materials or from the air of the working environment,

4. advise on the control of health hazards.

Article Twelve

The following units shall be put under the direct supervision of the Department Director:

1. Administration and Financial Unit, charged with the assessment of the Department's needs of personnel, implementation of personnel administration as well as taking care of financial matters and projecting a budget for the Department.

2. The Legal Unit which shall be responsible for:

   a. prepare ministerial orders, regulations and codes of practice aiming at protection of the environment, in cooperation with the technical offices within the Department,

   b. follow up the legal suits for violation of law No.62 and the orders enforcing it,

   c. investigate administrative and financial violations,

   d. prepare legal studies on subjects referred to it,

   e. study of the regional and international conventions regarding protection of the environment and advise the authorities concerned.

3. Research Unit, which shall carry out the following:

   a. suggest the general research plan for the protection of the environment,

   b. prepare annual programmes for the Department,

   c. coordinate research with other authorities,

   d. promotion of the technical manpower and laboratory capabilities for scientific research,

   e. prepare research budget and supervise its implementation.

4. International Relations Unit, charged with the following duties:

   a. organize international relations in the field of protection of the environment and coordinate participation of various Kuwait delegations in international meetings on the environment,

   b. organize relationships between the UNEP and Kuwait authorities concerned with protection of the environment and act as a local coordinator between the Programme and its regional committees,

   c. study regional or international draft agreements regarding the environment and advise on their merits in cooperation and coordination with the concerned authorities.

d. prepare for local meetings and seminars on the environment and participate in regional and international meetings on protection of the environment.

e. cooperate with the Kuwait Action Plan for the development and protection of the marine environment and the coastal areas, and coordinate its work with the concerned authorities.

Article Thirteen

Order No. 153/75 organizing the Occupational Health and Industrial Pollution Control Section is hereby rescinded. The said Section is also excluded from Order No. 249/77.

Article Fourteen

This order should be imparted to all parties responsible for its implementation and should be put into effect as of its (issuance) date.

/Signature/

Minister of Public Health

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