



THE NATIONAL BIODIVERSITY STRATEGY FOR THE STATE OF KUWAIT

Environment Public Authority, State of Kuwait

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PREFACE

لقد خطت دولة الكويت خلال العامين الماضيين خطوات هامة في مجال المحافظة على البيئة بشكل عام والمحافظة على التنوع البيولوجي بشكل خاص . وفي عام 1996 تم إصدار القانون رقم 1995/21 بشأن إنشاء الهيئة العامة للبيئة وقد فرض القانون بضم كل من مجلس حماية البيئة والإدارات والأجهزة العلمية الأخرى التابعة لوزارات ومؤسسات حكومية مختلفة إلى الهيئة العامة للبيئة، وذلك كخطوة جادة تتخذها الدولة في مجال تنظيم الشؤون الإدارية للمجال البيئي.

وأما في مجال المحافظة على التنوع البيولوجي فقد إتخذت الهيئة العامة للبيئة الخطوات العلمية الفعالة لإعداد الإستراتيجية الوطنية للتنوع البيولوجي التي تعتبر من أهم الوثائق المعنية بسياسة وبرامج الدولة الهادفة إلى المحافظة على التنوع البيولوجي وإستغلاله بصورة مستدامة . وعلاوة على أن إعداد الإستراتيجية من ضمن المتطلبات الرئيسية لإتفاقية التنوع البيولوجي التي وقعت عليه دولة الكويت في عام 1992 ، تعتبر الإستراتيجية برنامجاً تنفيذياً يبين مسؤوليات ومهام المؤسسات الحكومية وغير الحكومية في مجال المحافظة على التنوع البيولوجي . وتتبع دولة الكويت سياسة التعاون في مجال المحافظة على البيئة والثروات الحيّة وذلك من خلال التزاماتها الدولية والإقليمية وخاصة نحو مجلس التعاون لدول الخليج العربية . ويهدف هذا التعاون إلى الإستفادة من الخبرات والإمكانات المتاحة لدى هذه المنظمات والدول المساهمة فيها .

وبهذه المناسبة أدعو جميع الجهات ذات العلاقة للمساهمة والتعاون في سبيل تحقيق برامج وأهداف الإستراتيجية سواء كانت قصيرة المدى أم طويلة المدى .

ويطيب لي بإسم الهيئة العامة للبيئة أن أتقدم بجزيل الشكر إلى جميع المؤسسات الدولية والإقليمية والوطنية التي ساهمت في إعداد الإستراتيجية مؤكداً في نفس الوقت على أهمية إستمرار هذا التعاون مستقبلاً في تنفيذ برامج الإستراتيجية .

Sheikh Sabah Al-Ahmad Al-Jaber Al-Sabah
First Deputy Prime Minister
Minister of Foreign Affairs
Chairman of the Supreme Council of Environment Public Authority

PREFACE

The Environment Public Authority is privileged to present the National Biodiversity Strategy and Action Plan for the State of Kuwait which was prepared as a joint effort between the former Environment Protection Council and the International Union for Conservation of Nature (IUCN) and sponsored by the United Nation Development Programme, Kuwait (UNDP). The preparation of this strategy involved about 100 experts selected from the government, the non-government agencies and the private sector. Several steps were undertaken in preparing the Strategy. Ten task groups were formulated to assess issues related to status of biological resources, conservation in protected areas, conservation outside protected areas, financial needs, institutional responsibilities, legal aspects, education and public awareness efforts and others. A workshop was held on 6-7 February, 1997 to allow extensive participation to review the first draft of the document and to recommend action plan for implementation. The outcome of the workshop was development of an action plan to promote sustainable use and conservation of resources within specified time frame. EPA would also like to extend its appreciation to the members of the National Wildlife Committee and to all those who contributed in developing the Strategy.

Dr. Mohammad Al-Sarawi

**Director General of the
Environment Public Authority**

NATIONAL BIODIVERSITY STRATEGY

EXECUTIVE SUMMARY

“Biological Diversity”, means the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

Humans are now altering the Earth's natural environment and destroying biodiversity at a rate and extent, which are unprecedented in human history. As a result the economic and cultural life of many societies are faced with substantial threats.

Human impacts on biodiversity are caused by:

The increasing demands on biological resources by growing human populations and economic development;

The failure of government policies to address the overuse of resources;

The failure of people, governments and the economic system to recognise the true economic and social values of biodiversity; and

A lack of adequate institutional arrangements to regulate changing use of biological resources.

In Kuwait such impacts on biodiversity are increasing rapidly and on such a wide scale that they are threatening the nation's foundation for sustainable development. Kuwait does not have a high biodiversity heritage thus it is more vital that its scarce but highly adapted biological resources are conserved.

The Convention on Biological Diversity sets forth basic principles to guide biodiversity planning and suggests actions that could postpone a species extinction crisis and stabilise key genetic resources.

The principal objectives of the Convention are:

the conservation of biological diversity;

the sustainable use of its components and;

the sharing of the benefits that come from the use of genetic resources.

Kuwait is faced with serious environmental problems, which are leading now to the degradation of the nation's remaining biological resources. The greatest problems

concern: the widespread desertification of rangelands; lack of conservation areas; the unregulated hunting of wild animals; industrial and oil pollution of the marine environment; inappropriate coastal development; and excessive patterns of resource consumption. Moreover, the Iraqi invasion and subsequent war greatly exacerbated Kuwait's environmental problems.

The State of Kuwait signed the Convention on Biological Diversity at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992 but has yet to ratify the Convention. However, by signing the Convention Kuwait has acknowledged the value of biological resources as an integral part of its natural heritage with the potential for yielding long term benefits for human welfare and as the essential foundation for sustained economic development.

Signatories to the Convention are to identify important areas of biological diversity, establish methods to conserve biodiversity, regulate access to genetic resources and to transfer relevant technology.

The immediate purpose of this Strategy is to place biodiversity considerations in the national planning cycle and mainstream development process. It aims to create a cohesive policy framework to promote the conservation of biodiversity and the sustainable use of Kuwait's biological resources.

The underlying theme of the Strategy is the improved coordination and increased harmonisation of sector policies, programmes and legislation in order to fill institutional gaps and reduce overlap.

The Strategy is firmly based on overriding Islamic principles and values and aims for a future in Kuwait where all biological resources are being used sustainably.

To achieve the conservation of Kuwait's biodiversity through protection and sustainable use, the following elements are needed:

- Improve Kuwaiti society's awareness of the status and trends of the nation's ecosystems and alerting them to the impact their own levels of consumption and lifestyles have on biological resources.
- Institute and enforce appropriate legislation and regulations to protect and conserve biodiversity.
- Harmonise sector policies relating to biodiversity, introduce economic and social incentives for biodiversity conservation and abolish inappropriate policies and subsidies which lead to the loss of biodiversity.
- Develop a well-managed system of protected areas that give the widest possible representation of Kuwait's biodiversity.

- Encourage collaboration for conserving biodiversity between government departments, the scientific community, the private sector and the public.
- Enhance the nation's educational, research and technical capacity to better understand, analyse and monitor Kuwait's biodiversity.
- Improve regional co-operation for biodiversity conservation by establishing trans-boundary parks, harmonising management and exchanging information, experience and genetic resources.

To these ends the Strategy identifies a series of core initiatives for various sectors under a nation-wide biodiversity programme, which are to be implemented within targets and time frames in order to secure Kuwait's ecological integrity. The Strategy clearly designates priorities, practical actions and institutional responsibility for implementation over a ten-year period.

Acknowledgements

The preparation of the National Biodiversity Strategy for the State of Kuwait has proven to be a major task requiring the input of a large number of national and international experts and institutions. Also in order to produce a national document of the highest quality, the document was subjected to many reviews by the members of Drafting Committee, Experts at National Institutions and IUCN. In particular, the following persons and organizations have made significant contributions in the writing, reviewing, editing and translating the document:

- Members of the Kuwait National Biodiversity Committee, members of the Steering Committee, members of the Drafting Committee, Reviewers Dr. Abdullah Al-Zamel of the Geology Department, Kuwait University, Dr. Mohammed Al-Attar of KISR, Dr. Engineer Ibraheem Al-Shaheen of Al-Shaheen Consultant Office, Eng. Ali Abdullah of Salem Al-Marzouk and Sabah Abi-Hanna Consultants and Dr. Jeff McNeely of IUCN.
- The original draft of the document was prepared by the project consultant Dr. John Grainger who was able in a short time provided to outline and plan the preparation of the document and to write the first draft. His devotion, professionalism and cooperation are acknowledged and highly appreciated.
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- The tremendous secretarial work required during all phases of document preparation was ably carried out by Miss Angela of EPA and Miss Benny Sequeira of KISR. Their cooperation and efforts are hereby acknowledged

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THE NATIONAL BIODIVERSITY STRATEGY FOR THE STATE OF KUWAIT

PREAMBLE

A. THE CONVENTION ON BIOLOGICAL DIVERSITY

The term Biological Diversity, or its short form Biodiversity, is a relatively new term which according to the Convention on Biodiversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems. The importance of biodiversity is stated by the United Nations Environment Programme as follows:

"Biological diversity represents the very foundation of human existence. The rate at which humans are altering the environment, the extent of that alteration and the consequences of these changes for biodiversity are unprecedented in human history and are now beginning to pose substantial threats to the economic and cultural life of many societies" (UNEP, 1995).

The State of Kuwait signed the Convention on Biological Diversity in Rio de Janeiro, 1992 along with 155 other states, Kuwait has yet to ratify the Convention.

The aim of the Convention on Biodiversity is to pursue in accordance with its relevant provisions; the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources, including appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

The Convention on Biological Diversity sets forth the following basic principles to guide biodiversity planning and suggests actions that could postpone a species extinction crisis and stabilise key genetic resources in Member states:

1. conservation of biological diversity;
2. sustainable use of its components and;
3. sharing of the benefits that come from the use of genetic resources.

The Convention on Biodiversity requires each contracting party, in accordance with its particular conditions and capabilities to:

1. Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity or adopt for this purpose existing strategies, plans or programmes which shall reflect, *inter alia*, the measures set out in the Convention relevant to the contracting party concerned; and
2. Integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectorial or cross-sectorial plans, programmes and policies.

B. THE NATIONAL SITUATION

During the pre-oil era Kuwait's economy was based on utilisation of biological resources such as pearl oysters, fish, grazing animals, and fibre and medicine from desert plants. Despite the fact that the economy of the State of Kuwait is based primarily on oil revenues, the living resources continue to be of great importance for the people of Kuwait. Marine resources, especially fish and shrimp contribute 50% of the local seafood demand. Desert plants remain as an important source of feed for livestock and conventional medicinal products. Local breeding of livestock and poultry provide milk and meat for local consumption. Wildlife species especially a variety of bird species and many fish species are important for hunting and amateur fishing. Production of crops such as barley, wheat and dates are some benefits of biodiversity, which could be further expanded.

Natural resources were used at sustainable levels until the rapid changes of recent decades. Inevitably oil wealth, increase in the population and development in economy have brought up greater demand on natural resources. As a result, the nation's natural biodiversity has become devalued as it has lost its role as the mainstay of Kuwait's economy and culture. Kuwait's oil reserves are finite and will eventually be depleted unlike the nation's biological resources which are renewable and which with proper management can support human needs indefinitely in the post-oil future.

The primary causes of biodiversity depletion in Kuwait are gaps and weaknesses in policy, legislation and institutional responsibility. This has allowed widespread habitat destruction or alteration of critical and fragile habitats, uncontrolled development, excessive grazing and fishing pressure, uncontrolled hunting and the uncontrolled use of agrochemicals. This has largely come about because of increase in the population and social and economic changes.

A development paradigm based on rapid industrialisation and food self-sufficiency but which ignores conservation and efficient resource allocation has put unmanageable pressures on the country's biological resources. Protective

trade regimes, soft budget constraints, subsidised industries and lack of enforced environmental regulations have encouraged inefficient and wasteful activities in a number of sectors.

Kuwait is now faced with serious environmental problems, which are leading to the degradation of the nation's remaining biological resources. The greatest problems of concern include; the widespread desertification of rangelands, lack of conservation areas, industrial and oil pollution of the marine and terrestrial environments as well as depletion of fish and shrimp stocks by overfishing and inappropriate coastal development.

The disastrous war caused by the 1990 invasion of the State of Kuwait by Iraq and the enormous damage inflicted on the country drew world attention to the country's environment. There is now increased national concern over the implications of Kuwait's environmental problems particularly from the point of view of health, loss of cultural and biological heritage and the general impact on the quality of life. These environmental issues are too serious to ignore and must now be considered to be at the top of the National agenda and urgent reforms instituted. Kuwait does not have a high biodiversity heritage; therefore, it is even more vital that its scarce but highly adapted biological resources are conserved, and damaged ecosystems are rehabilitated.

By signing the Convention in 1992, Kuwait has acknowledged the value of biological resources as an integral part of its natural heritage with the potential for yielding long term benefits for human welfare and as the essential foundation for sustained economic development.

In addition to its international commitments Kuwait has an overriding moral obligation for biodiversity conservation. The Kuwaiti society has a value system and culture, which is rooted in Islamic principles. These principles predispose the society to act as stewards for the earth, to value all life and to take from nature no more than that which can be replenished.

The present document represents Kuwait's formal commitment to the present and future generation as well as the Convention on Biological Diversity and sets out a plan of action to reverse the trend of continuing biodiversity degradation.

C. STATUS OF BIODIVERSITY IN KUWAIT

Terrestrial ecosystems:

Twenty-eight mammalian species live in Kuwait. But four large mammals have been extirpated; the dorcas gazelle, the mountain gazelle (Idmi), the Arabian sand gazelle and the Asiatic cheetah (fahd). Other large carnivores such as the wolf, caracal and jackal are now extremely rare. Among the endangered mammalian species are the fennec fox, the red fox, the honey badger, the Indian grey mongoose and the wild cat. Causes for wildlife extinction are habitat destruction and extensive and unregulated hunting.

The reptile fauna is depauperate with no endemic species though 40 species have been recorded. Kuwait possess a fairly rich avifauna despite its small size and harsh climate with more than 350 species recorded; however only 18 species breed locally whilst the rest are passage migrants or winter visitors. Kuwait is situated at the crossroads of several major bird migration routes and between two and three million birds pass each year. The intertidal areas are important feeding (refuelling) areas for waders and shorebirds and with the destruction of the marshes in Iraq the small wetlands at Jahra have become increasingly important as a refuge for passage migrants. The coral islands are important breeding areas for four species of tern and the Socotra cormorant.

There are 374 recorded species of plants in 55 families. These include about 250 annuals, 83 herbaceous perennials and 34 shrubs and undershrubs species and one tree species.

Marine ecosystems:

Kuwait's marine and littoral ecosystems contain the bulk of the nation's biodiversity heritage. These ecosystems are comprised of several distinct habitats, which contain diverse assemblages of species, many of which are of economic as well as ecological importance. The habitats of particular biodiversity importance and interest are the muddy intertidal shores, the sabkhas and creeks, oyster banks, sea grass and algal beds, the coral reefs and the open water habitats.

While many groups of marine organisms such as the fish and planktonic species are relatively well known, there remains a large number of invertebrate groups, coral reef, species and subtidal benthic fauna which need investigation. To date, over 250 species of invertebrates have been recorded from the intertidal zone, and nearly 200 species of zooplankton and phytoplankton and 105 species of marine plants are recorded from Kuwaiti waters. Over 240 species of fish are known, 95 of which are associated with coral reefs: many marine species such as shrimps and grouper are of major importance for commercial and sport fishing.

Several species are of special conservation importance; the three species of gobiid fishes (mudskippers) of the intertidal zone; shrimps which are of commercial interest; the pearl oyster and two species of coral which apparently are not found elsewhere. The cyanobacteria, which are found along coastal flats, are also of ecological importance as they are capable of biodegrading spilled oil. There are also a number of other species, which are of high scientific interest because of their role in ecosystem dynamics.

D. PURPOSE AND SCOPE OF THE STRATEGY

The immediate purpose of this Strategy and Action Plan is to place biodiversity considerations centrally in the national planning and development process by informing and influencing all national sectors. It aims to create a cohesive policy framework to promote the conservation of biodiversity and the sustainable use of Kuwait's biological resources.

The scope of Kuwait's Biodiversity Strategy is wide. It encompasses the protection, restoration, sustainable and equitable use and the systematic investigation and monitoring of Kuwait's biodiversity. As the strategy covers so many issues and interests no single agency or management tool can be expected to meet all the objectives of biodiversity conservation. The effective implementation of this Strategy will depend upon a high level of political support, the integration and harmonisation of sectoral policies and legislation, as well as effective co-ordination between governmental agencies; non-governmental organisations, and the private sector.

The Strategy is the product of a wide participatory and consultative process, which will continue and expand as the process of strategic planning for biodiversity conservation matures in Kuwait.

The underlying theme of the Strategy is the improved co-ordination and increased harmonisation of sector policies, programmes and legislation in order to fill institutional gaps and reduce overlap. To these ends the Strategy identifies a series of core initiatives for various sectors under a nation-wide biodiversity programme, which are to be implemented within target time frames in order to secure Kuwait's ecological integrity. The strategy clearly designates priorities, practical actions and institutional responsibility for implementation.

THE STRATEGY

1. OVERALL GOAL

The overall goal of this national strategy is to protect Kuwait's biological diversity in the natural modified and cultivated systems, maintain ecological processes and foster the sustainable use of these resources for the benefit of the present and the future generations.

2. ISLAMIC VISION OF BIODIVERSITY

Islam mandates that Muslims should appreciate and benefit from God's creation, and should strive towards protecting the Earth's living and non-living resources against misuse and destruction.

The Holy Quran and the Hadith of the Prophet Mohammad (PBUH) are rich with vivid statements which not only show Allah's wisdom in creating a balanced universe, but also show people how they should enjoy God's creation and how they should protect this creation from misuse and destruction.

The Holy Quran dictates;

- ***“ We said, Embark therein of each kind two (male and female), and your family ”.***

HUD - No.40

***” قلنا احمل فيها من كل زوجين اثنين وأهلك
سورة هود (40)***

- ***“ There is not animal (that lives) on the earth, nor a being that flies on its wings, but (forms part of) communities like you”.***

AL-ANA'M No.38

***”وما من دابة في الارض ولا طائر يطير بجناحيه الا أمم أمثالكم
سورة الأنعام (38)***

- ***“ Eat and drink But waste not by excess, for God loveth not the wasters ”.***

AL-A'RAF No.31

***”كلوا واشربوا ولا تسرفوا انه لا يحب المسرفين
سورة الاعراف (31)***

- ***“ And do not mischief on the earth, after it hath been set in order”.***

"ولا تفسدوا في الارض بعد اصلاحها"
سورة الاعراف (56)

In the guidance of the Prophet (PBUH) or the Hadith, he has said:

- ***"Do not cut a tree or kill a cow except for eating".***
- ***"If a Muslim plants a tree from which a bird or a human being or an animal will feed, he shall be rewarded".***
- ***"Whoever brings life to a dead land, he shall become the owner of that land".***

Kuwait is an Islamic country and Islam is the major imperative for wise utilisation of natural resources and for protection of all forms of life and conservation of natural habitats. From the cultural point of view, Kuwaitis have a long history in dealing with and using the resources available in the environment. Many examples are found in the Kuwaiti folklore regarding nature and its protection.

3. BASIC PRINCIPLES OF KUWAIT'S BIODIVERSITY SRATEGY

- Human existence has and always will be dependant on biological diversity and therefore the productive capacity of biological systems and resources must be maintained.
- Biodiversity with all its associated processes can only be fully expressed within functioning ecosystems and so can only be properly conserved where it occurs *in situ*.
- Conservation of biological diversity is a moral responsibility shared by all levels of government and all members of society.
- Decisions affecting the allocation or use of indigenous biological resources should be equitable and transparent processes.
- Indigenous biodiversity must be protected against the deleterious impacts of introduced alien species.
- Development programmes must be ecologically as well as economically sustainable and should be demonstrated as being so.
- Significant causes for the reduction of biodiversity should be anticipated, prevented and remediated at source.
- Obvious remedial action to preserve biodiversity from deleterious activities should not be hindered by lack of full knowledge of the total impacts.
- For commonly owned biological resources that the user pays for access to biological resources and the polluter or developer pays for the remediation or the rehabilitation of impacted or damaged ecosystems.
- The tangible and hidden values of biodiversity and its processes are to be fully acknowledged in the national accounting system.

4. GENERAL MEASURES FOR THE CONSERVATION OF BIODIVERSITY IN KUWAIT

4.1 DOCUMENTING KUWAIT'S BIODIVERSITY

OBJECTIVE: Develop a comprehensive understanding and documentation of Kuwait's biological diversity and ensure its continued characterisation and monitoring.

Analysis:

Article 7 of the Biodiversity Convention stresses that a first requirement in any programme should be to characterise the status of the subject.

The inventory of Kuwait's biodiversity is far from complete. The terrestrial fauna particularly birds, insects and the large mammals have been reasonably researched. The higher plant flora has also been well documented. In the marine environment major gaps exist in the inventory of microbial communities, invertebrates and planktonic species, which are vitally important, as they constitute the foundations of major marine food chains.

To date most taxonomic and ecological inventory research has been directed at ecosystem components. There has been limited research directed at whole ecosystem dynamics aimed at understanding the interrelationships between various habitats and species and their role in maintaining biodiversity and its processes. Resource management that uses knowledge of the processes from intact ecosystems is invariably more effective and costs less.

Sustained inventory programmes are a prerequisite to monitor the health and productivity status of economically productive ecosystems to maintain the sustainability of harvest. Programmes to determine the status of commercial fish stocks and rangeland productivity are the main priorities. Inventorying and monitoring activities are also required for nationally and internationally threatened species and those species of social importance.

The results of species and ecosystem monitoring must be considered in management regimes and be reflected in related policy and legislation. These data should be generally available and therefore have to be collated into a national database.

Main Constraints:

Kuwait's species and community inventories are still far from complete. The lack of data is particularly evident in those ecosystems and habitats that contain high diversity, especially the marine environments, and habitats that are required by migratory species. Another serious concern is the lack of co-

ordination and collation of data among agencies involved in inventory work and the absence of a national biodiversity database.

Strategic Response:

The Government will seek to enhance biodiversity documentation and monitoring programmes in Kuwait through the provision of adequate funds and specialist technical training to enable the nation to benefit and sustainably manage its biodiversity heritage. A national biodiversity database will be established at an appropriate institution, which will be accessible, by all accredited agencies and individuals.

AGENDA FOR ACTION

Short-term (1-3 years):

1. Establish a national biodiversity committee to oversee and co-ordinate biodiversity inventory monitoring
2. Establish a national biodiversity database.

Medium-term (3-5 years):

3. Institute properly scaled monitoring programmes, provide a "feed-back" loop to determine changes in biodiversity status and management interventions.
4. Develop a long-term plan for the exploration, inventory and taxonomic study of Kuwait's biodiversity.
5. Establish technical training for specialists in taxonomic disciplines and biodiversity monitoring.

Long-term (5-10 years):

6. Institute research of critical ecosystems, which will lead to the understanding of ecological processes that characterise them.

4.2 PLANNING FOR KUWAIT'S BIODIVERSITY

OBJECTIVE: Institute ecological approaches to national socio-economic planning and management, based on current knowledge of how ecosystems function, to prevent or mitigate adverse impacts and their causes.

Analysis:

Development, particularly when it is accomplished at the unprecedented rate experienced in Kuwait, inevitably has an impact on biodiversity. The Strategy acknowledges that development is both desirable and inevitable. At the same time it underscores the need to establish the fundamental link between development and the environment if development is to be sustainable. The Strategy also promotes the principle that all government and private sectors, which influence biodiversity, must be involved in conservation planning and management. The difficulty has always been in how to promote the development process in an environmentally sustainable manner, which avoids fragile environments, reduces impacts and institutes biodiversity sensitive and conservative management schemes.

Kuwait's development process has been shaped by a series of Master Plans dating back to the 1950s but these have concentrated mainly on physical development and not on the environmental implications of this development. This is evident in the extensive landfilling of productive and ecologically important intertidal areas. There is a pressing need to incorporate biodiversity considerations more widely into the master planning process.

Master planning where environmental characteristics are a principal determinant of boundaries will be of major importance if biodiversity conscious planning is to succeed. Emphasising bioregional characteristics can facilitate the integration of conservation and production oriented management of biodiversity. A good example of the bioregional planning approach would be the development of a much-needed integrated coastal zone plan for Kuwait.

At a lower planning level a widely accepted global practice for incorporating biodiversity into the planning process is the prior evaluation of all planning and development projects through Environmental Impact Assessment (EIA). Protecting the environment from damage is much easier and ultimately less expensive than trying to remediate environmental damage. From a procedural point of view, EIAs should be conducted during project design and certainly before project implementation; if carried out afterwards it encourages the perception that environmental concerns simply inhibit development, and mean additional cost.

In Kuwait EIA procedures were broadly specified in the Environmental Protection Law of 62/1980 however it was only in 1990 that EIA procedures for Engineering and Industrial projects were issued under the Ministerial Order

9/90. During this ten-year gap extensive development took place without EIA applications. An extensive review and revision of Kuwait's EIA procedure is urgently required which should be based on an acceptable system of principles and values.

Main Constraints:

There is presently no independent, publicly transparent and accountable procedure for the EIA process particularly for large-scale government and private projects.

There is a need to enhance the technical knowledge of the potential damage to marine ecosystems from major projects such as the massive withdrawal of water for desalination, land fillings of coastal areas, and excessive use of water. Present development has been focused on building new capacity rather than encouraging conservation. Social attitudes and the relative affluence of Kuwait society grown accustomed to unlimited consumption are also critical to resource use; for instance the high per capita consumption of water in Kuwait with the state subsidising the true cost of production. Lack of clear energy and water conservation policies leads to spiralling consumption and further exacerbates the situation, as new generating capacity becomes necessary.

Intensive public or political pressures also often compromise Master Plan proposals as well as by ineffective controls. Another major constraint to environmentally sound planning in Kuwait is the lack of a bioregional approach and the absence of a national land classification scheme on which to base land-use strategy. This is especially critical for the coastal zone where most development is concentrated. The land use classification system should identify levels of permitted use based on considerations of land characteristics, capability, landscape values (historical, cultural) and biodiversity considerations.

Strategic Response:

National Planning: The Government will ensure that biodiversity considerations are immediately incorporated into the current process for development of the master plan with particular emphasis on fragile and productive environments especially along the coastal zone in Kuwait Bay and Khor Assubiyah. Strict controls on landfill of coastal areas will be introduced. The Planning regulations are to be more effectively enforced through penalising and removal of illegal development especially along coastal areas.

EIA Procedures:

Biodiversity issues in EIA mechanisms will be mandatory and all EIAs will require an assessment of costs and benefits to both development and conservation. The EIA process will be based on an acceptable system of values, principles and practices that are to be endorsed and promulgated by the Government. For example:

- Biodiversity considerations have to be clearly demonstrated in all phases of project design and planning and not after the fact.
- The EIA process and the governmental EIA regulatory authority must have public accountability with a clearly defined role for the public in terms of representation and appeal.
- The rights and expectations of developers have to be taken into account but must not override issues of sustainability and social costs.
- All remediation of environmental damage is to be at cost of the developer.

Land Classification: A national system for land classification and land use coding is to be introduced to assist development planning in Kuwait. The principles of Biodiversity Planning and a system of land use codes will be employed with the development of a Coastal Zone Management Plan for Kuwait's entire coastline, which will be commissioned, as a matter of urgency.

AGENDA FOR ACTION

Short-term (1-3 years):

1. Incorporate Biodiversity Strategy principles into current Master Plan and National Planning process.
2. Conduct total review of EIA ordinance and procedures with reference to Biodiversity.
3. Commission a Coastal Zone Management Plan (CZMP).

Long-term (5-10 years)

4. Develop a national system of land classification and land use codes for planning purposes and land capability analysis.

4.3 MANAGING KUWAIT'S BIODIVERSITY

OBJECTIVE: Strengthen institutional capacities for co-ordinated management and conservation of Kuwait's biodiversity particularly by improving integrated policy making, developing and enforcing legislative arrangements and monitoring of compliance.

Analysis:

Biodiversity conservation can only be effectively achieved in all sectors through integrated policies and institutional arrangements such as:

- instituting activities to reduce impacts on biodiversity and ensure sustained improvements in environmental performance through EIA procedures, enforcing the "polluter pays" principle and promoting environmental standards and industrial best practices.
- introducing land use codes, modifying land use practices and by encouraging sector agencies with control over large areas of land e.g. Ministries of Oil, Defence and Electricity and Water, to set aside some proportion of those areas specifically for biodiversity conservation.

Therefore, it is unrealistic to expect the total national responsibility for the management and conservation of biodiversity to reside solely within a single environmental authority. Such authorities can only weakly influence the activities of key sector agencies which are often more powerful or influential than itself.

Integrated Policy Issues:

The development of integrated policies for major users or sectors with significant impacts on biodiversity is a prerequisite to the co-ordination of such activities within and between levels of government. These policy statements and strategies need to be widely circulated, publicly available, properly understood by all sector levels and fully implemented.

Legislation Issues:

Over the past fifteen years, the main national legislative instrument relating to conservation of biodiversity has been Decree Law No. 62/1980 which provided in addition to establishment of Environment Protection Council (EPC) a series of general policy guidelines for the protection of the environment and the establishment of protected areas. This Decree Law has been surpassed by Laws No. 21/1995 and No. 16/1996 concerning establishment of Environment Public Authority (EPA). Thus, a comprehensive plan with supporting legislation and financial arrangements to implement the law has to be prepared.

Additional biodiversity-related legislation in force before the Iraqi invasion included the close regulation of commercial fishing and a ban on grazing over a large part of Kuwait. Since the invasion these regulations have not been properly enforced. A law for the designation of protected areas was drafted by EPC and referred to the Council of Ministers prior to the invasion. It is being reviewed by EPA and has yet to be adopted. Likewise, the State of Kuwait has signed the Biodiversity Convention in 1992, but has yet to ratify it.

Institutional Reform Issues:

Biodiversity conservation is a relatively new concept and requires novel institutional arrangements for effective action. Such an arrangement does not exist in Kuwait, which seriously affects co-ordination in regard to the Biodiversity issues.

Main Constraints:

Policy: In spite of the earlier efforts of EPC to harmonise the National Environmental Protection policy with Agenda 21 (Rio, 1992), there is still an absence of integrated policies to help broaden responsibility for impacts that affect biodiversity conservation within all government sectors, the private sector and the society as a whole.

Legislation: At present there are major gaps in biodiversity related legislation as there are no legislative arrangements to declare and gazette protected areas and there are no laws to regulate hunting or trade in wildlife. There are also major weaknesses in enforcement of existing laws such as fishing regulations and use of agrochemicals particularly pesticides.

Institutional: The major concern is the fact that agencies which have the central mandates for biodiversity conservation are poorly equipped to fulfil their mandates. There are poor institutional arrangements, practical co-ordination and sharing of information between the various administrative and management bodies involved with biodiversity issues in Kuwait.

Strategic Response:

Integrated Policy: In response to this National Strategy each ministry and sector agency in Kuwait, in co-ordination with the EPA, will be required to review their present mandates, policies and strategic plans in terms of biodiversity conservation. Each ministry will then draw up a strategy for measures to ensure the conservation of biodiversity elements within their mandate. The Precautionary Principle (Rio-declaration, 1992) and the principle that deals with the causes for the loss of biodiversity are to be fundamental to the development of these strategies.

Legislation: There are serious gaps in present legislation relating to the protection and sustainable use of Kuwait's biodiversity and also in the enforcement of current legislation. In the first instance and through Law No. 62/1980 the Government shall take urgent steps to draft and introduce legislation to regulate hunting of wildlife species and for the legal designation and management of protected areas. The Government will also review enforcement procedures for all current biodiversity legislation including regulations for agrochemicals.

Institutional Reform: The operational Environment Public Authority requires a broad mandate to cover biodiversity protection and sustainable use. It should be granted effective and executive authority to implement action. The major responsibility for conserving elements of biodiversity will be devolved to those agencies which have some mandate over, or whose activities influence, those elements. These agencies will be required to develop biodiversity strategies and held accountable for their compliance. The Environmental Authority with cross-sectoral representation and effective regulatory powers and enforcement authority can then assume a more effective role of co-ordinating policies and monitoring compliance.

Since, PAAFR is one of the authorities, which has the mandate to establish and manage protected areas; its managerial capacity in the field will be strengthened and co-ordinated with that of EPA.

AGENDA FOR ACTION

Short-term (1-3 years)

1. Support and fully resource the Environment Public Authority for effectively co-ordinating the implementation of Biodiversity Strategy.
2. Review all sector policies and strategies in relation to biodiversity with particular emphasis on agriculture, fisheries and water sectors and the effect of subsidy programmes on biodiversity and its related processes.
3. Immediate strengthening of institutions and agencies concerned with protected areas, management and development.

Medium-term (3-5 years):

4. Update, introduce and implement legislation for the establishment and management of terrestrial and marine protected areas.
5. Strengthen legislation and enforcement procedures with particular emphasis on polluter-pays principle and establishment of licensing system to ensure that anti-pollution measures are taken.

Long-term (5-10 years):

6. Develop programmes for capacity building of Kuwaiti nationals for conservation of wildlife and management of protected Areas.
7. Make information regarding biodiversity issues publicly available.
8. Promote the development of integrated biodiversity sensitive policies in key sectors.

4.4 USING KUWAIT'S BIOLOGICAL RESOURCES

OBJECTIVE: Review the present use of all biological resources in Kuwait to determine socio-economic incentives which will foster such use within sustainable limits particularly in key resource-based sectors such as agriculture and fisheries.

Analysis:

The Biodiversity Convention calls for conservation of biodiversity through both protection and sustainable use. Sustainable use of biodiversity is considered a prerequisite for sustainable social and economic development; it ensures the continuing provision of goods and services from ecosystems and their components. However in many biodiversity related sectors present Government policies lead to non-sustainable use.

Kuwait's arid lands are fragile with comparatively low species diversity and abundance; they are particularly vulnerable to human influence as recovery times are long and the productivity of these ecosystems is inherently low. However because biological activity plays an important role in moderating the harsh environment any alteration of the biodiversity elements will have negative feedback on the remaining components leading ultimately to widespread degradation.

In contrast Kuwait's diverse coastal and marine ecosystems are highly productive. These adjacent ecosystems are interdependent; interference with one ecosystem can lead to major changes in an associated ecosystem.

Crop Agriculture: The agricultural sector in the State of Kuwait is beset with a number of fundamental problems, including excessive use of brackish water which ultimately leads to build-up of salinity in soil and overuse of agriculture chemicals particularly pesticides which leads to build-up of organochemicals residues in the soil. In addition, subsidies for land leases, water, electricity, organochemicals and crop price result in degrading the natural resources base and adversely impact the biodiversity.

A twenty-year Agricultural Master Plan and a Strategy for Sustainable Agricultural Development in Kuwait have recently been completed; the severe environmental limitations on conventional agriculture are clearly recognised in both documents.

Rangelands: Rangelands constitute most of Kuwait's total land area. Traditional nomadic practices, which sustainably exploited the rangelands, were an important cultural aspect of Kuwait and contributed significantly to the nation's meat and milk supplies. Today the grazing system has been distorted by commercial forces and subsidies such as the artificial supply of water, trucking of animals, feed supplements and the employment of expatriate shepherds. The rangelands are overstocked, are grazed continually throughout the year with no period for recovery. As a result many of the rangelands' indigenous species of plants and animals have been exterminated from large areas, the natural productivity of the range has been seriously degraded which has resulted in widespread desertification. The cultural and recreational values of the desert also are being lost.

Although the Government maintains a social policy towards range users, the range is used for a nominal fee, which does not encourage conservative use. Furthermore, there is cross border grazing which is not controlled. Despite the fact that rangelands are massively overexploited by a small section of society at great cost to society as a whole, local sheep breeds provide only 5% of Kuwait's total red meat needs. In 1988, the Decree No. 41 was passed to regulate grazing in Kuwait, however this has not been enforced since the Iraqi invasion.

Fisheries: Kuwait's marine fisheries resources are constituted by two main components, namely fin and shrimp fisheries. The domestic fisheries account for approximately 50% of the national requirement and constitute an important element of the economy as well as being an important recreational opportunity for Kuwaitis. Traditional oyster fisheries for pearls have declined in recent years.

Aqua-cultural fisheries are not well developed in Kuwait but there is growing commercial interest with at least one company raising exotic species of fish in open topped cages in Kuwait Bay. Such systems may pose a threat to native species.

Previously the Government enforced stringent fishing regulations but, since the invasion, these have not been properly enforced, particularly for shrimp. The shrimp catch has declined after the invasion and there are serious concerns for the survival of shrimp stock. A considerable amount of fisheries productivity is wasted through discarding by-catch species and the wastes from fish processing all of which could be used for animal feed.

Fisheries are also under considerable pressure from coastal development, which is destroying vital breeding and nursery grounds, and recreational fishing around coral reefs. Spearfishing using diving gear should be banned since it is highly selective and can lead to major loss of biodiversity. Fishing by coastal fish traps (Hadra) and steel cages (Gargoor) also need to be better regulated.

A twenty-year planning framework for the sustainable development of Kuwait's fisheries resource was drawn up in 1988 but to date has been only partially implemented.

Main Constraints:

Crop Agriculture: Agricultural development priorities and strategies in Kuwait have been focused on seeking self-sufficiency which have ignored conservation and efficient natural resource allocation practices and advanced greenhouse production systems. To date, there is no integrated approach to sustainable agricultural development.

Rangelands: Though rangelands constitute 70% of Kuwait's area, they have not been identified as a land-use category in any of Kuwait's master plans. In practice, there is still no comprehensive national policy or strategy for the sustainable management and development of rangelands and their associated biodiversity.

Fisheries: Commercial fisheries are threatened by selective fishing without adequate knowledge of the stock levels of fish species, particularly shrimp, and overall poor enforcement of fishing regulations.

Strategic Response:

The Government should acknowledge the value of Kuwait's agricultural, rangelands and fishery resources and the imperative for their sustainable use. The Government should also understand that incentives in the agricultural sector must avoid encouraging inefficiencies, which result in resource and biodiversity (environmental) degradation. There is a pressing need to restrict open access and for the efficient allocation of tenure rights to Kuwait's biological resources to ensure their sustainable use.

The Government shall review and implement the Agricultural Master Plan in order to achieve a transition to an economically realistic and biodiversity sensitive agricultural sub-sector that practices stewardship of the land and precious water resources.

Kuwait's rangelands should be recognised as a major land-use category requiring special attention. The development and management of rangelands are to be integrated as a major element into the master planning process, which gives prime consideration to the concept of sustainable use. The Government will commit itself to establishing a sound scientific foundation for range management, which balances optimal livestock production with environmental conservation. The maintenance of traditional nomadic pastoralism and native sheep breeds will be paramount considerations. The government should initiate and implement a national desertification combating strategy with a prime objective of rehabilitating Kuwait's rangelands.

The Government will ensure that conservative fishery regulations are enforced by PAAFR particularly with respect to close seasons and restricted fishing

areas. Critical habitats for fish breeding will be identified and protected from inappropriate development through a national coastal zone management plan. The Twenty-Year Plan for Sustainable Fisheries Development will be reviewed and implemented.

All information and public awareness systems should be used effectively in ensuring that Kuwaitis are well informed of the implications of range degradation and fish stock depletion. Training on optimal resource management should also be introduced.

AGENDA FOR ACTION

A. Agriculture:

Short-term (1-3 years):

1. Integration of biodiversity strategy with those of sector agencies eg PAAF.
2. Review and implement the Agricultural Master Plan

Medium-term (3-5 years):

3. Review current agricultural subsidy programmes for agricultural inputs in terms of biodiversity impacts and phase out those subsidies with negative impacts.
4. Review land tenure system and institute measures for providing secure tenure at realistic prices to encourage land and water stewardship
5. Prepare and implement a national desert protection strategy and action plan to rehabilitate rangelands by introducing sustainable grazing regimes (through the establishment of grazing tenure system and long term licences system to give graziers a stake in rangeland productivity), establishing exclosures, reducing sand movement and controlling destructive activities such as quarrying.

Long-term (5-10 years):

6. Reduce excessive application of agrochemicals through withdrawal of subsidies and extension programmes.

B. Rangelands

Short-term (1-3 years):

1. Identify rangelands as a specific land use category in a national classification scheme and integrate into the national planning process.
2. Review and implement the Agricultural Master Plan particularly those aspects, which lead to the development of livestock production farms.

3. Institute and fund an applied research programme for the sustainable management of rangelands. Research should concentrate on impact of total grazing pressure in rangelands on biological diversity and the resilience and regenerative capacity of palatable species.

Medium-term (3-5 years):

4. Establish a national advisory body for conservation and development of rangelands to help implement research findings.

Long-term (5-10 years):

5. Enforce current grazing restrictions and compulsory seasonal withdrawal of stock from range.
6. Institute appropriate regulated system giving graziers licensed tenure over grazing land at realistic fee to encourage investment in grazing resources.
7. Regulate camping and encourage responsible tourism.

C. Fisheries

Short-term (1-3 years):

1. Review and implement the Strategic Framework and Master Plan for Fisheries Development in Kuwait.

Medium-term (3-5 years):

2. Enforce fishing regulations through proper organisation of fisheries protection vessels and market inspections.

Long-term (5-10 years):

3. Encourage use of native species for mariculture in open marine systems.
4. Integrate fish aquaculture with irrigated agriculture.

4.5 VALUING KUWAIT'S BIODIVERSITY

OBJECTIVE: Introduce socio-economic measures to reflect the true value of biodiversity in order to encourage conservation and sustainable use of scarce biological resources, discourage waste and pollution and stimulate biodiversity-sensitive activities.

Analysis:

An underlying cause for the degradation or loss of biodiversity is the failure to recognise the true value of biodiversity in financial and economic terms. The economic challenge in managing Kuwait's biodiversity is to balance the benefits derived from exploiting biological resources against the true social costs caused by the reduction or loss of diversity. Islam dictates that the private benefit from the use of a common resource must not be gained at the expense of the public.

Economic incentives and penalties or disincentives can be effective tools for enhancing implementation of the Strategy; therefore an important element for obtaining political and public understanding and support for biodiversity conservation is the determination of the economic value of biodiversity; this can be readily done for specific productive sectors such as agriculture and fisheries. However the less tangible values of other biodiversity processes, such as waste degradation, nutrient recycling, soil formation, soil stabilisation, recreational use etc. should also be considered. This will require the wider application of resource economic techniques for genuine cost-benefit analyses.

It will be possible then to confront resource users with the full social cost of their activities e.g. use of desalinated water for agriculture, ship oil spills and adjust current distortions in markets caused by perverse policies such as subsidies and enable those who invest in biodiversity to reap the benefits

However Islamic principles dictate that economic values alone are not an adequate measure of the public good and that ethical considerations must play a role in the decision making process. Kuwait is making financial provisions for future generations through the establishment of the Fund for Future generations derived from oil revenues. The same considerations should be extended to the conservation of biological resources.

Main Constraints:

Biodiversity tends to be perceived largely in scientific and conservation terms rather than in economic or resource terms. This results partly from the difficulties of quantifying the socio-economic benefits of conserving biodiversity.

Furthermore, the benefits of applying environmentally friendly technology in the industry, particularly petrochemicals for the protection of biodiversity are not considered.

Economic pricing of environmental resources is notoriously difficult in particular with regard to the application of discounting rates for the future. The present subsidy systems, particularly for agriculture and fishery products are not geared to the conservation and protection of biological resources and biodiversity. The Government will face pressures in implementing socio-economic reform and find it difficult to curb policies, which are causing loss of biodiversity. Requiring that consumers pay the real cost of natural resource use and that polluters pay for pollution is politically unattractive but essential.

Strategic Response:

The Government will re-evaluate the need and measures for conservation utilising all the parameters available, including but not restricted to, economic values, subsidies, policies and land use policies.

Economic incentives and disincentives to promote biodiversity conservation are to be a major element for all sector programmes particularly in those sectors which have a major impact on biodiversity i.e. agriculture, animal husbandry, fisheries and water supply providing subsidies to clean and environmentally friendly technology.

AGENDA FOR ACTION

Short-term (1-3 years):

1. Applying methodology for valuing biodiversity taking into consideration socio-economic measures.
2. Conduct detailed surveys of the effect of various household activities on biodiversity.

Medium-term (3-5 years):

3. Conduct detailed survey of the direct and indirect subsidies that are provided to economic activities such as fisheries and agriculture that affect biodiversity.
4. Link licensing of industrial activities to their effects on biodiversity.

Long-term (5-10 years):

5. Provide subsidies to environmentally clean technologies.
6. Broaden the scope of the National Account System to include the benefits and costs on the ecosystem of various production activities such as fisheries, agriculture and manufacturing.

5. SPECIFIC MEASURES FOR BIODIVERSITY CONSERVATION IN KUWAIT

5.1 CONSERVING BIODIVERSITY THROUGH PROTECTED AREAS

OBJECTIVE: Establish an adequate, representative and ecologically viable system of protected areas in the terrestrial and marine environments of Kuwait for conserving indigenous fauna and flora.

Analysis:

A protected area is defined in the Convention as a geographical area, which is designated or regulated and managed to achieve specific conservation objectives. The World Conservation Union (IUCN) has defined a global classification system for different types of protected areas which have nature conservation as their primary goal. IUCN has recommended that a minimum of 10% of each country's surface area should be under effective conservation management.

The Arabian Peninsula has a long tradition of protecting biological resources through the "Hema" system which predates Islam but was endorsed by the Prophet (PBUH). The Hema system was used to protect areas for specific needs such as grazing, honey production or wildlife. People relied on these hemas to sustain them particularly in times of hardship. A modern system of protected areas, based on the hema concept, will be critical for the preservation of Kuwait's biodiversity.

A number of national parks, nature reserves and recreational areas have been proposed within the reviews of the National Master Plans prepared for Kuwait since 1970 and in 1980 KISR undertook a feasibility study for the establishment of protected areas

In spite of these recommendations Kuwait presently lacks an effective system of protected areas either terrestrial or marine. A 333 km² area centred on the Jal Az-Zor was designated as Kuwait National Park and was fenced by PAAFR in 1989 but no management activities were instituted. The fence was destroyed during the Iraqi invasion and all protection was lost leading to serious degradation and impoverishment of fauna and flora. In 1996 the boundaries of the area were redesignated and re-fenced by the Ministry of Defence. The formal status of the area and management responsibility needs to be clarified.

The Jahra Pool Reserve is the only significant terrestrial wetland in Kuwait and a vital habitat for resident and migratory birds. The Reserve is designated by Kuwait Municipality to be managed jointly by EPA and PAAFR but has no legal status. The area is fenced but inadequately protected.

Five of Kuwait's islands which are made up of rare high-latitude coral reefs and which support breeding turtles and nesting seabirds were recommended as

cores for marine reserves by EPC and KISR but no legal action has been taken to protect any of them from heavy visitor, boat fishing or development and pressure from military presence. A draft Amiri Decree for designation of these islands as protected areas has been produced by EPC and is waiting for approval.

There are a number of other *de-facto* protected areas including experimental range enclosure, the oil field exclusive rights areas controlled by the Kuwait Oil Company (KOC), designated military areas and underground water extraction areas under the jurisdiction of the Ministry of Electricity and Water (MEW). The establishment of a strictly enforced de-militarised zone along the Kuwait - Iraq border has led to the protection of a significant part of Wadi Al Batin, which has the potential for the development of a permanent border Peace Park.

The institutional responsibility for protected areas requires reassessment. Under Decree Law 94/1983 protected areas fall under the management and supervision of PAAFR. There is no separate department for protected areas within PAAFR and the responsibility is given to the Department of Greenery and Landscaping. At the same time the former EPC has also been empowered by Decree Law 62/1980 to carry out surveys for protected areas and is involved in active protected area management. However the identification and subsequent allocation of government land for any purpose including protected areas is the responsibility of the Municipal Council, and Kuwait Municipality. Development approval for these lands then has to be approved by Ministries of Water and Electricity, Petroleum, Defence and Interior. However, it is anticipated that the newly formed EPA will have a greater mandate over designation and

Main Constraints:

The major constraints to establishing and developing a system of protected areas are:

- The lack of well defined institutional responsibility and distinct legislative arrangement for the designation and establishment and management of protected areas;
- The absence of a systematic approach to protected area planning.
- The lack of trained manpower and resources for managing protected areas;
- The absence of clear objectives for different categories of reserves within a system of protected areas.

Strategic Response:

The Government needs to emphasise the value of protected areas for the conservation of biodiversity as well as for education, research and recreation purposes to the long-term benefit of Kuwait. It will ensure therefore that a national system of ecologically viable protected areas which is representative of the range of the nation's ecosystems is established. To this end a national system plan for protected areas in Kuwait will be commissioned as a priority.

The Government will strengthen or where necessary introduce new institutional arrangements for the effective establishment and management of terrestrial and marine protected areas. The Government will commit adequate resources for the management of protected areas, which will also include programmes to restore and rehabilitate the local fauna and flora.

The Government will undertake to have all national protected areas designated under appropriate and enforceable legislative instruments and ensure that they are managed in accordance with an approved management plan.

AGENDA FOR ACTION

Short-term (1-3 years):

1. Conduct a systematic biophysical evaluation of Kuwait's terrestrial and marine environments to identify representative and priority sites for protection and conservation management (produce a System Plan for Protected Areas in Kuwait).
2. Enact legislation and regulations for the establishment and management of protected areas.
3. Seek immediate establishment of appropriate institutional arrangements for protected areas with emphasis on the National Park of Kuwait/Jal AZ Zor.
4. Seek key sector involvement in instituting biodiversity management in areas under the control of Ministries of Defence, Petroleum, Electricity and Water and others.

Medium-term (3-5 years):

5. Draw up management plans for all protected areas and institute properly scaled monitoring programmes, providing a "feed-back" loop to determine any change in the biodiversity status of protected areas and the need for adjusting management
6. Identify training requirements and train staff in protected area management techniques

Long-term (5-10 years):

7. Investigate options for transboundary and peace parks,
8. Establish desert museum and information visitor centre at Jal Az Zor
9. Evaluate potential of Wadi Al Batin for early re-introduction of gazelles and oryx.

5.2 BIODIVERSITY CONSERVATION OUTSIDE PROTECTED AREAS

OBJECTIVE: Maintain wild flora and fauna across all Kuwait's ecosystems by enhancing efforts to conserve and where necessary rehabilitate/restore indigenous biological resources where these occur naturally.

Analysis:

Many of Kuwait's habitats are severely degraded, including those in areas designated for protection and it is unlikely that the components of these systems will recover naturally within the foreseeable future even if afforded full protection. This is particularly true for faunal elements as most of large species are now endangered or extinct in Kuwait.

Restoring the fauna will involve the re-introduction of animal species raised in captive breeding programmes; priority species would include gazelles and oryx. Though there are a number of native animals in captivity in Kuwait zoo, there is neither an insufficient stock for a sustained breeding programme nor the expertise for successful re-introduction of either gazelles or oryx. However several neighbouring countries have surplus animals and the re-introduction expertise to assist. In anticipation of this Kuwait will need to identify a long-term strategy for captive breeding and re-introduction.

Vegetation rehabilitation is a more protracted enterprise, which may require the re-seeding of areas with native species. Range exclosures will be important sources of seed for the re-colonisation of immediately adjacent range areas and for collection and re-seeding of other protected areas.

Main Constraints:

The long-standing activities which have caused the loss of biodiversity such as overgrazing, indiscriminate hunting, off-road use of vehicles, spear-fishing and dumping of boat refuse on coral reefs have become uncontrollable behaviour and it will be extremely difficult to constrain these activities or change attitudes without effective legislation and public education campaigns. The absence of legislation to regulate hunting or to protect any endangered species is a major concern. Kuwait's non-ratification of any of the international conventions relating to biodiversity e.g. Bonn Convention on Migratory Species is also of concern.

Strategic Response:

To support *in-situ* conservation programmes Kuwait will need to enact legislation, which regulates hunting and protects internationally and nationally endangered species. International conventions for habitat conservation and species protection already exist e.g. the Biodiversity, Desertification and RAMSAR conventions, and Kuwait immediately should ratify these conventions. Regional accords for the conservation of migratory species such as Houbara are being developed and need Kuwait's active support. A national species conservation strategy should be developed for all-important wild species in Kuwait, which identifies their status and conservation requirements and required measures for their protection.

The Government will develop a national capacity for the ex-situ conservation of locally threatened plant and animal species in co-operation with neighbouring countries and appropriate regional and international organisations.

AGENDA FOR ACTION

Short-term (1-3 years):

1. Institute and enforce legislation regulating all hunting including spearfishing (see Section 4.3). The legislation will specify closed seasons and protected species and prescribe methods of hunting and restricted areas. Other related legislation will be drafted to control access to and supply of equipment e.g. guns spearguns and ammunition.
2. Prepare a national strategy for the conservation of all threatened and endangered species (plant and animal) which determines their status, conservation requirements, including legislation, and population restoration measures such as captive breeding/propagation and re-introduction.

Medium-term (3-5 years):

3. Develop, in line with the Species Conservation Strategy, a national capacity for the ex-situ conservation of locally threatened plant and animalspecies; in co-operation with neighbouring countries, particularly Saudi Arabia, to assist with the restoration of Kuwait's large mammal fauna through the donation and exchange of expertise and animal stock.

5.3 MANAGING SPECIFIC BIOLOGICAL PROCESSES WHICH THREATEN KUWAIT'S BIODIVERSITY

OBJECTIVE: Protect indigenous biodiversity from likely impacts resulting from the introduction or release of exotic or genetically altered organisms.

Analysis:

The global escalation of the rate of biodiversity loss is primarily caused by environmental changes (i.e., habitat destruction). Some of the most dramatic incidents of known species extinction have been brought about through the effect of exotic/alien species invading new environments where they thrived and displaced or destroyed native species. Globally almost 20% of the vertebrates thought to be in danger of extinction are threatened in some way by non-native species (WRI, IUCN ref Global Biodiversity). Alien species may be introduced either accidentally, such as release of organisms in water ballast from tankers, through escapes of species imported for a limited purpose such as pets or fish for mariculture, or deliberate introductions for landscaping or agricultural purposes.

Many species are introduced to benefit human welfare and this is particularly true of agricultural species; the great bulk of human food needs are met by introduced species which are therefore essential for human welfare. Despite these positive effects there is overwhelming evidence that many introductions lead to severe disruption of ecological communities and heavily influence the genetic diversity of indigenous organisms by reducing populations and through hybridisation.

Kuwait imports a wide variety of plant and animal species for various purposes and the potential exists for the importation of non-indigenous species which if improperly controlled have potential for environmental damage.

As trade expands local agricultural plant varieties and animal breeds increasingly are being substituted by imported species even though there may be a cultural preference for local varieties. Local plant species are frequently overlooked for landscaping purposes. Mariculture using exotic species to increase fish production is set to expand in Kuwait. The use of local species should be encouraged.

Many of these local breeds and varieties are the products of generations of selective breeding and represent a valuable genetic resource, which should be conserved to maintain genetic resilience and options for the future.

An increasing global concern is biosafety, which is the need to ensure the environmentally safe application of modern biotechnology and its product specifically genetically modified organisms (GMOs). Organisms which have

been genetically altered or contain genetic material from other organisms are increasingly being developed and introduced into the environment. Clearly biosafety regulatory procedures are required for the safe transfer, handling and use of genetically modified organisms. In recognition of this, most industrialised countries now have biosafety regulations in place.

Main Constraints:

There are strict animal and plant health quarantine regulations in force. However there are presently inadequate regulations and protocols for the screening and control of potentially invasive species, which may be introduced intentionally or accidentally into Kuwait.

There are no guidelines for the regulation of biotechnology or policies and recommended procedures for the transfer, handling, use and disposal of genetically modified organisms. Present government policies and economic incentives favour the propagation of imported crop cultivars and animal breeds over local varieties and breeds.

Strategic Response:

The Government recognises the potential threat to the national biodiversity heritage posed by the introduction of alien species. To counter real or potential threats, the Government will enact legislation to regulate the import and introduction of alien species.

In recognition of the need for biosafety the government will also enact legislation and protocols governing the handling, transfer and introduction and disposal of genetically engineered and trans-genic life forms.

In order to conserve indigenous genetic resources, the Government will encourage the continued production of local varieties of food crops and animal breeds. It will also review existing environmental screening procedures for imported plant species and encourage the use of adapted local species particularly for landscaping projects.

AGENDA FOR ACTION

Short-term (1-3 years):

1. Establish national biotechnology and genetic engineering committees.
2. Establish environmental screening procedures for imported plant species particularly for landscaping projects.
3. Establish national gene banks of indigenous species for both wild and cultivar species.

4. Enact national legislation to regulate the import of alien species particularly marine organisms such as fish for mariculture.
5. Encourage, through subsidies, the maintenance and conservation of traditional cultivars (e.g. dates) and local breeds of domestic animals.

Medium-term (3-5 years)

6. Enact biosafety legislation and protocols governing the handling, transfer and introduction of alien species and genetically engineered and transgenic life forms including the disposal of all experimental material.
7. Ensure the full transfer of relevant technology and operating skills for Kuwait to develop its local biotechnological base.

Long-term (5-10 years)

8. Seek regional co-operation and bi-lateral agreements for biotechnological enterprises.

6. BUILDING CAPACITY FOR BIODIVERSITY CONSERVATION

6.1 PROVIDING KNOWLEDGE AND UNDERSTANDING

OBJECTIVE: To build up Kuwait's research, monitoring and training capacity for biodiversity particularly with relation to conservation biology, biotechnology and technology transfer needs.

Analysis:

Research: The role of research and monitoring is critical, since this underlies Kuwait's abilities to take advantage of the opportunities offered by biodiversity and to make informed decisions about its ultimate use.

Biotechnology can provide important advances in the use of genetic and biological resources for economic gain e.g. production of chemicals for industry or medicine, environmental remediation or for industrial processes. Biotechnology is also an important tool for managing biodiversity and increasing benefits e.g. agricultural technology to increase food production or to develop low impact agriculture.

Because of its great potential for expanding these linkages between conservation and sustainable use of genetic diversity modern biotechnology is developing rapidly. However, biotechnology also raises major ethical problems and concerns over unintended consequences which may pose risks for human safety and environmental health.

Kuwait has some biotechnological capacity at its research facilities. As the technology becomes more sophisticated Kuwait must develop this capacity and ensure it has access to the required technology, skills and genetic material.

Training: Committed and skilled people are the key to the successful maintenance and sustainable use of biodiversity. Training for people who will manage protected areas, conduct biological inventories, curate *ex-situ* collections etc., must be provided along with the necessary research and management tools. There is a parallel need to develop educational and training programmes to service these capacity requirements.

Main Constraints:

Despite the high level of education achieved by Kuwaiti nationals in many disciplines and fields of specialisation, there is a lack of specialists in the area of biodiversity research. In particular, there are not enough plant and animal taxonomists, range scientists and biotechnology specialists. Also, at the institutional level, biodiversity related research is not recognised as a priority area in comparison to research on petrochemicals, pollution and engineering. Kuwait has not yet recognised the value and importance of biotechnology and genetic engineering and important means for enhancing food production, producing pharmaceutical products and improving biodiversity. Furthermore, unlike the fisheries, other biological resources are not targeted for the possible exploitation considered in research plans.

Strategic Response:

The Government will provide the means for Kuwait to develop an appropriate biotechnological and genetic engineering capacity; the Government will exercise rights to ensure that all biotechnological projects with international involvement and all imported biotechnology will include the full transfer of relevant technology and operating skills to Kuwait.

Develop local biotechnological research programmes to investigate the potential of industrial and pharmaceutical products from indigenous marine organisms.

The Government will encourage through the GCC and ROPME regional initiatives and bi-lateral arrangements co-operation in the development of biotechnology and the utilisation and conservation of genetic resources. The Government will also seek regional co-operation through GCC and bi-lateral agreements for biotechnological enterprises.

AGENDA FOR ACTION

Short-term (1-3 years)

1. Develop methodologies and protocols for biotechnology to assess probabilities of negative impacts (field and laboratory)

Medium-term (3-5 years)

2. Develop local biotechnological research programmes to investigate the potential of industrial and pharmaceutical products from indigenous marine and terrestrial organisms.
3. Develop an appropriate biotechnological and genetic engineering capacity.
4. The Government to exercise rights and ensure the full transfer of operating skills and information procedures for all imported biotechnology (related technology)
5. Establish ethical guidelines for biotechnology.

Long-term (5-10 years):

6. The Government will encourage the development of biotechnology and the utilisation and conservation of genetic resources through regional co-operative initiatives.

6.2 EDUCATING AND INVOLVING KUWAIT SOCIETY IN BIODIVERSITY ISSUES

OBJECTIVE: Improve society's understanding of the ethical, cultural and economic values of biodiversity through education and encourage the public's active participation in its conservation.

Analysis:

Islamic principles require everyone to value all life and use the Earth's resources in a sustainable manner that will not jeopardise future generation's ability to exploit these same biological resources.

Increasing the understanding and appreciation of biodiversity's benefits is a critical task and the lack of public understanding and support will be a major constraint for the successful implementation of the strategy. The Government and senior decision makers need to become better informed about biodiversity in order to make more responsible decisions concerning the management of Kuwait's biological resources.

School curricula are vital for educating the youth about the importance of natural habitats and biodiversity. Present school curricula inadequately deal with this issue. It is therefore imperative that the educational system be fully utilised in creating appreciation for nature and conservation of natural resources.

There is a need for sustained wide-ranging programmes for raising public awareness as to the importance of biodiversity to human welfare. These programmes must avoid the current approaches where single issues or events

are advertised. National programmes can have immediate results when they are targeted at decision-makers and staff of key Government officials.

However, it is equally important that all Kuwaitis are involved in biodiversity conservation. Experience world-wide has shown the importance of local level/grass roots initiatives. In recent years local NGOs have become the major driving force behind effective conservation activities. It is crucial to impart a sense of community involvement and responsibility at all levels from monitoring, active planning, research etc.

Main Constraints:

The highly consumptive lifestyle patterns which have emerged at all levels and in all sectors of Kuwaiti society make it difficult to educate and orientate people to the concept of sustainable use. Also the concept of biodiversity and its sustainable use are new ideas and as such are not fully understood by the educators themselves.

At present, all public awareness programs are presented in Arabic and English. Many of the expatriates do not speak or understand neither Arabic nor English and therefore it is difficult for these people to benefit from any public awareness program.

The highly privileged lifestyle of Kuwaitis encourages overconsumption. In general, there is poor mobilisation of public opinion including those of expatriates.

Strategic Response:

Increase public awareness aimed towards conserving biodiversity and understanding the impacts of personal lifestyles. Local NGOs will have an important role through public debate, awareness raising, assisting grass root planning and management capacity and implementing small environmental projects

EDUCATION

Undertake a fundamental review of the educational curricula at all levels in light of current knowledge of biological diversity and where necessary incorporate new material in all disciplines and subjects emphasising inter-relationships and relevance of biodiversity etc.

Support and encourage further professional development to equip teachers with skills for scientific, economic and social aspects of biodiversity.

Encourage continuing education among adults to increase environmental awareness.

PUBLIC AWARENESS

The Government will promote awareness regarding implications of misuse and overuse of biodiversity, and institute measures to encourage conservation.

Media networks will be encouraged to commission and produce broadcasting programmes related to biodiversity. Efforts will also be directed towards encouraging public participation in the biodiversity debate and conservation related activities e.g. volunteer groups for clean-up, youth rangers for parks etc.

The EPA will develop and propagate awareness programmes among all levels of decision makers in appropriate ministries

The government recognises that NGOs can provide an essential input for biodiversity conservation and sustainable development policies. The role of NGOs should be widened and enhanced.

The Government will increase the availability and accessibility of information about biodiversity by issuing "State of Biodiversity " reports in Government publications such as the EPA annual report. The information should be tailored for specific users, e.g. farmers, fishermen etc. The Government will conduct vigorous and wide-ranging public awareness campaigns to gain support for *ex-situ* conservation.

AGENDA FOR ACTION

Short term (1-3 years)

1. The Government will conduct vigorous and wide ranging public awareness campaigns to gather understanding and support for actions; the programmes will be aimed at alerting decision makers to these concerns and also at changing public attitudes and behaviour.

Medium term (3-5 years)

2. Major attention will be given to the orientation and involvement of the public media in biodiversity issues; education institutions, the professional development of teachers and school curricula will be assessed and revised accordingly. NGOs, which have an educational role, will be supported by the continued availability of impartial information and appropriate institutional support.

7. KUWAIT'S INTERNATIONAL ROLE

OBJECTIVE: Foster and support regional and international conventions and protocols relating to biodiversity conservation particularly with regard to migratory species and critical habitats.

Analysis:

The conservation and use of biological resources are global issues, which need to be addressed through international and regional co-operation.

Regionally Kuwait is a contracting party to the 1978 Kuwait Regional Convention for Co-operation on the Protection of the Marine Environment (ROPME). Kuwait actively participates with additional protocols particularly the Kuwait Action Plan (the UNEP Regional Seas Programme for the Arabian Gulf) for the protection and development of the marine environment and coastal areas. Kuwait is also a signatory to the Arab Declaration on Environment and Development, the Protocol for Regional Co-operation and various GCC Policies and General Principles for Environmental Protection. Though Kuwait's contribution to regional initiatives has already been beneficial. at present it is not signatory to any of the global conventions for biodiversity.

Regional partnerships will be needed between Gulf countries to co-ordinate policies, share relevant experience, share resources and technology. Kuwait needs to be more pro-active in its relations with and support of international agencies involved with biodiversity conservation particularly those which are establishing regionally based programmes such as IUCN, UNEP, FAO etc.

Trans-boundary protected areas could effectively extend Kuwait's system of protected areas along both its land and sea borders. The present de-militarised zone extending along both sides of Kuwait's border with Iraq is an effective protected area with restricted access. With political will and international support this area could be established as an international peace park of great significance where locally extinct species could be reintroduced. Though the concept is radical it is not new and should be thoroughly investigated as trans-boundary protected areas would both benefit from, and help with, restrictions on access and development and would enhance national security.

Additional trans-boundary protected areas could be established with Saudi Arabia.

Main Constraints:

The Main constraints is that Kuwait has not ratified any of the major international arrangements relating to conservation of biodiversity namely the Convention on Wetlands of International Importance (Ramsar Convention), the Convention on Migratory Species (Bonn Convention), the Convention on

International Trade in Endangered Species (CITES) or the Convention for the Protection of the World Cultural and Natural Heritage.

Strategic response:

Kuwait will review at an early stage all international biodiversity related agreements such as the Biodiversity, Bonn (Migratory Species), Ramsar (Wetlands) and World Heritage Conventions with the intention of ratification. Kuwait will also seek observer status to CITES (SpeciesTrade).

Where appropriate Kuwait will take an active part in regional initiatives and accords for biodiversity conservation such as the Houbara management plan.

Bilateral and multilateral aid programmes will be reviewed to ensure there are no significant impacts on Biodiversity in recipient countries. Furthermore, international scientific collaboration on biodiversity issues will be strengthened.

AGENDA FOR ACTION

Short-term (1-3 years):

1. The EPA to arrange a review of all international biodiversity conventions as early as possible in order to ascertain their implications for the State of Kuwait.
2. Following the review the EPA will advise the Government to ratify appropriate conventions namely the Biological Diversity Convention, the Bonn Convention for Conservation of Migratory Species, the Ramsar Convention for Protection of Wetlands and other relevant conventions at the earliest opportunity.
3. The EPA will review status of Kuwait's participation in all bilateral, multilateral agreements and arrangements relevant to biodiversity conservation.

Medium-term (3-5 years):

4. The EPA will evaluate Kuwait's international role with regard to funding biodiversity conservation initiatives, which serve its national interests.

8. IMPLEMENTING THE STRATEGY

OBJECTIVE: For the EPA in partnership with other agencies to implement the strategy through priority actions within realistic time frames.

Analysis:

Translating this Strategy into effective action will be a challenge because of the inter-sectoral nature of biodiversity. To achieve this it is critical that the mechanisms of implementation are identified such as systems for national co-ordination and review, the development of complementary strategies and the provision of adequate funding. Implementation of the Strategy also will require a range of specific tools such as incentives, targeted investments, institutions and public information. Elaborate plans frequently remain unimplemented because no clear programme of implementation was laid out and little political support had been obtained during the development of the plan.

Implementation of strategies and plans may also be problematic because an institution's formal mandate is often confused with its actual operational effectiveness. Effective planning and implementation requires real power and authority. Plans rarely work if the agency is weak even if it holds mandated responsibility. For biodiversity management, a realistic appraisal is needed of all agencies' capacity and effectiveness. The Environmental Protection Authority (EPA) will be the lead agency to catalyse biodiversity planning and elicit cross-sectoral co-operation.

Close co-ordination between national agencies will be crucial but the involvement of "users or stakeholders" such as fishermen and farming co-operatives will be equally important particularly when negotiating resource access rights and regulations. Furthermore programme to monitor implementation and measure success must be clearly defined; this will help ensure implementation and allow "feed back" into the plan. The interest and involvement of the public must be sustained throughout.

Establishment of a focal point for biodiversity within the Environmental Protection Authority will be essential for co-ordinating activities related to the implementation of the strategy.

Main Constraints:

A broad range of human activities and natural phenomena affect Kuwait's biodiversity and the maintenance of its ecological processes and systems. This is reflected in the objectives and strategic responses of this Strategy and the range of sectors and agencies involved. The responsibility for the Strategy therefore does not fall easily into existing administrative structures and mandates and the inclination to so in the interests of efficiency and cost should

be avoided. This may lead to a loss in the integrative perspective provided in the Strategy.

Other factors which need to be considered include: the present limited capacity of sector management organisations, the lack of public participation in decision making process for environmental management: and the fact that at present NGOs are not in a position to play an integral role in the implementation of the Strategy.

These factors may act independently or collectively as constraints against full implementation of the Strategy. For instance a commonly held view is that establishing a protective regime over areas will necessary lead to the exclusion of any economic utilisation of the area or its contained resources. The economic and social benefits of protected areas are therefore unrealised and the establishment of protected areas is resisted.

A serious constraint is the lack of comprehensive legislation to support the implementation of the Strategy and the present inadequate enforcement of existing biodiversity related legislation.

Strategic Response:

The Government's strategic response is based on the acceptance of the ecological imperative that biodiversity delivers goods and services to the human economy; as source of food and materials, as sinks for wastes, and by maintaining favourable environmental conditions.

The Government recognises the moral and social imperative to implement the Strategy on behalf of the people of Kuwait and its future generations

The Government acknowledges that new policies, legislation and implementation mechanisms will be needed to effectively implement the Strategy; a primary requirement will be the establishment of a biodiversity focal point within the government structure.

The Government will undertake a fundamental review of all national development strategies in terms of their implications for biodiversity conservation.

A comprehensive legislative framework will be developed to ensure adequate provision is made for the conservation of biodiversity in Kuwait. The legal framework will ensure that conservation and sustainable use of natural resources are integrated into Kuwait's wider social, economic and cultural contexts. Where necessary the institutional capacity for enforcing national legislation will be strengthened

The Government will implement the Strategy in a holistic manner and ensure that the necessary legal, institutional and financial arrangements are made available to accomplish this.

The Government will implement the Strategy through its Agenda for Action in a timely manner through initiating an annual schedule of activities, prioritised on a realistic assessment of urgency for action and the institutional capacity of lead and partner agencies.

The EPA will be responsible for co-ordination and overseeing the implementation of the Strategy; and where appropriate the EPA will assist partner agencies including NGOs with technical and financial support .

The Strategy will be financed through EPA central budget allocations; however in order that the Strategy remains as opportunistic as possible the EPA will seek to raise additional revenue to fund biodiversity initiatives as they arise. The possibility of establishing a National Biodiversity fund from various sources such as fees from biodiversity use, private donations and war reparation funds.

The EPA will seek the greater support, involvement and investment by the private sector in instituting environmentally sustainable activities and projects such as the management of environmental services e.g. sewerage and agricultural technology.

In the process of implementing the Biodiversity Strategy the EPA will take full advantage of the resources available with the regional and international organisations such as ROPME, the GCC, IUCN and UNDP. In particular EPA will continue to seek the co-operation of IUCN with the ongoing development and implementation of the Strategy.

AGENDA FOR ACTION

A. POLICY AND LEGISLATION

Short-term (1-3 years):

1. Review national policies, sector development strategies and institutional mandates in terms of biodiversity conservation in order to identify gaps and overlaps.
2. Establish a national committee to review and evaluate existing biodiversity related legislation and other relevant regulations and assess the extent to which they are enforced.

Medium-term (3-5 years):

3. Strengthen institutional capacity for enforcing national biodiversity related legislation.

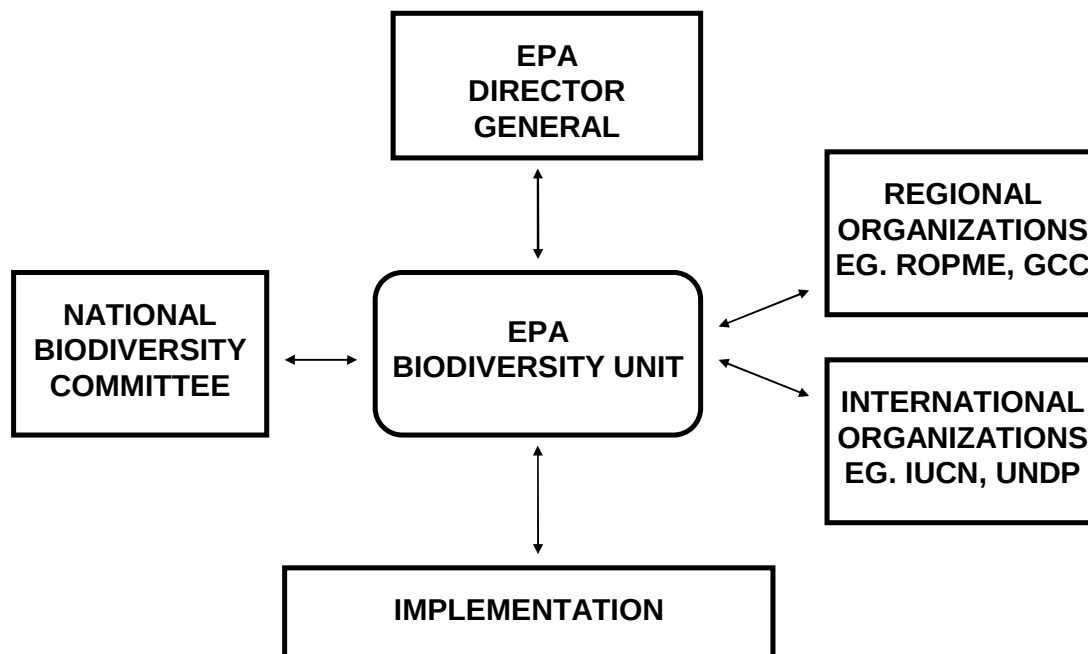
B. INSTITUTIONAL ARRANGEMENTS

Short-term (1-3 years):

1. Establish a National Biodiversity Committee (NBC) from representatives of Governmental, Non-Governmental Organisations (NGOs) and the private sector. The NBC will be the national and international focal point for biodiversity in Kuwait and will advise the Director General of EPA for the implementation of the Strategy.
2. Establish a Biodiversity Unit (BU) and appoint a Biodiversity Co-ordinator to assist the Director General with the co-ordination and implementation of the National Biodiversity Strategy at the national, regional and international levels. The Biodiversity Co-ordinator will be the rapporteur for the NBC.

The institutional arrangements for implementation will be as follows:

BIODIVERSITY STRATEGY IMPLEMENTATION: INSTITUTIONAL STRUCTURE



C. FUNDING BIODIVERSITY CONSERVATION

Short-term (1-3 years)

The EPA will fund the implementation of the Strategy through its central budget allocation.

Medium to Long-term: (3-5 years)

1. The EPA will seek to supplement this funding by raising revenue from:

- Funds raised from biodiversity use e.g. grazing, commercial and recreational fishing, fees from visitors to protected areas, hunting licences
- Income from land leases and pollution penalties.
- International assistance for specific programmes.
- Assistance from local and regional trust funds such as Awqaf Fund for the development of the Environment and Kuwait Foundation for the Advancement of Sciences.
- Donations from the private donors and individuals.

D. MONITORING AND REVIEWING THE STRATEGY

Short-term (1-3 years):

EPA's Biodiversity Unit will monitor the implementation of the Strategy and report directly to the NBC. An annual review will be conducted by the NBC and the Strategy and Agenda for Action will be modified and budgeted accordingly with revised priorities for action and funding.

E. NATIONAL REPORTING ARRANGEMENTS.

Short-term (1-3 years):

The EPA will report on the state of biodiversity conservation in Kuwait as part of its annual report to the Government. Following Kuwait's ratification of the Convention on Biodiversity the EPA will report to the Conference of Parties as required.