CBBIA Pre-Meeting And IAIA
Annual Conference
April 24 – 30,2004-04-20
VACOUVER, BRITISH COLUMBIA , CANADA

Integration of Biodiversity Considerations into Environmental Impact Assessment Process In The Republic of Yemen

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Yemen Map

1. Geographical Information's:

1.1 Location and Area

The Republic of Yemen lies in the southwestern part of the Arabian Peninsula Between latitude 12 40 and 19 00 North, and 42 30 to 53 05 East longitude. It is bordered by Saudi Arabia in the north, the Arabian Sea and the Gulf of Aden in the south, Oman in the east, and the Red Sea in the west.

Yemen covers an area of about 555.000 sq km excluding the Rub AI-Khali. and has about 2000 km of coastline along the Red Sea and Gulf of Aden. The altitudinal range extends from sea level up to 3760 meters at Jabel AI-Nabi Shuaib, the highest point in the Arabian Peninsula.

1.2 Climate and Rainfall
Mean annual temperatures range from less than 15C in the highlands to 30C in the coastal plains.
Rainfall and temperature are the most important factors for life. Because moisture from rainfall is the minimum factor it is determines much of the ecology. Rainfall varies from less than 50 mm in the coastal plains and desert plateau regions to more than 1200 mm in the western mountainous highland region occurring in two periods, first March-May and second July-September.

1.3 Topography and population:
Yemen's 18.3 million population lives on 2% of its total geographical area of about 45 million ha. The population is scattered at about 41,800 villages with 74% of the population living in settlements of less than5, 000 people thus making difficult the extension of basic services to this group of the population. The natural topography of Yemen is divided into four major regions: the coastal region, the high lands, and Tehama and Eastern plateaus.

Population density per Region

Region	*Percentage of population*
Coastal	*10*
High lands	*59*
Tehama Plateau	*11*
Eastern Plateau	*29*

1.4 Economy Trends:
The unification of Yemen on 22nd of May 1990 marked a new ear in the history of Yemen. Thirteen years after the development march in the united Yemen started , the country is still classified by the United Nations as one of the least developed countries (LDC)> GDP per capita was $ 473 ($ 1.3 per day at nominal terms) in 2000, compare to 4 701 in 1990. The population grows from 12.9 million in 1990 to 18.3 in 2000, registering an annual population growth rate of 3.5%.(Ministry of Planning,2003).

1.4 Cultural History
Early records have proven that a highly developed culture existed in Yemen Beginning the tenth century BC and included the kingdoms of Ausan, Karban Ma'ain, Hadramout and Sheba. The prosperity of these ancient civilizations Depended on trade and agricultural activities. The ancient Yemenis carried out Sophisticated engineering projects like the Ma'rib Dam and numerous Irrigation systems which helped in creating surplus agricultural products. That Prosperity prompted the Romans to call it "Arabia Felix" or happy Arabia.

2. Conservation Background:

For millennia, the Yemenis were able to live with their environment in a sustained fashion. Yemeni farmers started cleaning the hillsides and steep mountain slopes to increase the area of arable land. Terraces were constructed to conserve soil and water to improve water use efficiency and to increase crop production. The terraces in Yemen constitute a national heritage and sustained food security in years past. The terraces system is built in response to rainfall patterns and rainfall uncertainties and provides optimal soil and water management in dry mountainous / terrain range. Management of fishing occurred also in well-balanced operations. Today, Yemen's natural resources represent the basis of the national economy. The medium and long-term economic development of Yemen is very much depend upon the appropriate management and sustainability of the limited resources in the country.

The biological diversity of Yemen, which includes unique species of wild and domesticated animals and plants and their genetic variety and habitats, is severely threatened. If no serious actions are taken, many native species of plants and animals of local and global importance are going to be pushed toward extinction.

As custodians of this global heritages, Yemenis are coming to realize that their livelihood and security are in peril until present and future generations are assured the safety and integrity of their over biodiversity and natural resource base.

In some areas of Yemen, the local communities applied basic principles to strive and maintain the integrity of their lands and marine resources and their biotic wealth. The principles include respect for the intrinsic value of all forms of life, while uses need to be made both sustainable and equitable. They include also, responsible public management based on accountability, transparency, and participation in decision-making and a full analysis of impacts, collaborative management agreements and institutions with it, all affected communities and groups, participate in policy actions that affect their right entitlements for the biotic resource. The indigenous natural resource management systems of the Yemen people be supported, protected, and utilized and seen as a rich natural heritage.

3. Status of Biodiversity in Yemen:

Yemen is considered one of the rich countries in biological diversity. It hosts more than 3000 species of plants, about 71 species of mammals 363 species of birds and more than 115 species of amphibians and reptiles. More than 250 species of plants and 25 bird species are considered endemic to Yemen. In Socotra Island alone, about 30% of the plants are endemic. Twenty percent of spider mite species and 10 % of insect species in the island bear the name of the island as a genus or species.

Vegetation in Yemen is a mixture of that found in the African continent (Tropical and Sudanian plant geographical region) and that found in the Afro-Asian desert regions (of the extra tropical and Sahara-Arabian plant geographical region. The Sahara-Arabian element predominates in the regions with an arid climate (The Tehama Coastal Plain and the Eastern Plateau) while the Sudanian
Element predominates in the western escarpment with semi-arid or semi-humid climate.(NBSAP,2001).

3.1.Coastal and Marine Biodiversity:

Yemen's coastal and marine environment is both diverse and attractive from its rocky and sandy coasts to the saline mud flats, mangrove swamps, coral reefs and sea gras beds. Its patch, fringing and bottom reefs are known to contain at least 90 species of corals which have been recorded. There is likewise a great diversity of fish (416 spp), 82 species of sea and shore birds, 625 species of mollusks, algae (485 species), phytoplankton (283 species), as well as four species of marine turtles, including the most important nesting beach for Green Turtles in the entire Arabian Region at Ras Sharma. Compared to other parts of the Red Sea, the shallow nutrient rich waters above the wide continental shelf of Yemen are rich fishing grounds. Fish supply a great amount of protein in the diet of Yemenis, and now with the improved road communications systems, people in the populated mountain areas can also enjoy a more diverse diet with seafood. An array of threats from pollution to coastal reclamation and bottom trawling now threats our coastal and marine environment. It is important to limit these and initiate and implement sound integrated coastal zone management for sustainable use of Yemen's marine and coastal environment including the identification and management of protected areas.

3.1.1. Threats and constraints: -

The following are considered the major threats to the coastal and marine environment of Yemen:

- Uncontrolled use of coastal zone
- *Destruction of coastal habitats*
- *Spatial conflicts among various users*
- *Unplanned coastal reclamation*
- *Destruction of marine and coastal habitats and ecosystems*
- *Liquid and solid waste pollution from sewage, industrial plants, ports facilities*
- *Agro-chemicals flushed by floods*
- *Oil pollution*
- *Cutting of mangroves for wood and use of mangroves for feeding camels*

- *Over fishing beyond MSY of several species*
- *Sharp decline of important resources especially lobsters, cuttlefish, shrimps and sharks*
- *Poaching of foreign vessels*
- *Uncontrolled gear and fishing effort*
- *Lack of fish quality control*
- *Destruction of benthic habitats by bottom trawling*
- *Destruction of coral reefs, reef fishes*
- *Destruction of endangered species due to non-selective gear*
- *Oil pollution from passing ships*
- *Oil spills and Waste dumped by ships*

3.2. Agriculture Biodiversity:

Historically, Yemen was a good example for the economic sustainable use of the available natural resources, where conservation of soil, crops, and rangelands were part of the traditional systems and terraces were mainly built for conserving crop and soil from erosion.

Recently , the growth rate in agricultural GDP which averaged only 2.4% during the period 1990-95, fell short of the population growth rate of 3.7% (according to 1994 Census), which is considered one of the highest growth rate in the world.

The most formidable challenge to sustainable agriculture is the degradation of natural resources. In view of Yemen's population growth, continuation of current production

Systems can't meet Yemen's future developmental needs because they are not environmentally sustainable and they have already reached almost close to their Maximum potential with full use of limited resources such as water and natural vegetation.
The development policy in the past 30 years has been focused in short-term objectives, which gave immediate economic benefits, while the impact of this development process on the environment was ignored. As a result, destruction and degradation of natural resources have reached a critical level.
For Yemen in order to achieve future sustainable development, agricultural biodiversity conservation projects must be included in the developmental socio-economic plans of the government.

Arable land counts for 1.6 million hectares representing 3% of the total area of Yemen. During the last five years, it is estimated that about one million hectares has been actually under cultivation. The main field crops are: cereals including sorghum, wheat, maize, millet and barley; vegetables including potato, tomato, beans, cucurbits, onions, carrots, crucifies, okra, eggplant and pepper; fruits including grapes, dates, citrus, guava, mango, peach, apples, banana, papaya, apricot, almond and pomegranate; cash crops including Qat, cotton, coffee, sesame and tobacco; forage and feed crops including alfalfa, sorghum feed crops and grasses. Rangelands forests and other woodland areas comprise about 40% of the land area. About 3.5

million sheep, 3.5 million goats and 1.1 million cattle graze the land. The remaining land, almost 57% of the total land area, is mostly desert with limited use potential.

3.2. 1.Threats and constraints:

1. Deterioration of Genetic Resources
(Plants, animals and honeybees)

- *Loss of Indigenous adapted varieties*
- *Subsidies of imported grains*
- *Shift in Diet and consumption habits*
- *Introduction of homogeneous high yielding varieties*
- *Deterioration of local cropping systems*
- *Introducing unsuitable breeds and Dilution of indigenous livestock and chicken breeds*
- *Indigenous breeds are less competitive*
- *Deterioration of indigenous Yemeni honeybee race and honey quality*

2. Shortage of technical information on Agricultural biodiversity issues

- *Lack of public awareness on certain issues of biodiversity*
- *Lack of knowledge of Agricultural biodiversity with decision makers*
- *Lack of media and necessary educational programs on Agricultural Biodiversity*
- *Lack of endemic livestock census ,reliable data and electronic data base*
- *Inadequate information on endemic or endangered plant and animal species that need to be protected*

3. Land degradation

- *Desertification*
- *soil erosion*
- *Agriculture & Range land degradation*
- *Collapse of terraces*
- *Loss of farm land due to urban encroachment*

4. Water depletion & supply for irrigation

- *over extraction of ground water*
- *Lack of water conserving systems*
- *Inadequate water supply services*
- *Overuse of water led to loss of drought resistant varieties*

5. Agro-ecosystem (Habitat) Degradation

- *Degradation of natural habitats (Forests/range/wet lands/wild life)*
- *Frequent drought that affects plant, animal and honeybee population and production*
- *Mortality of animal, plant and honeybee species due to pests and diseases*
- *Loss of biodiversity (Extinction of endemic, rare and endangered species)*
- *Smuggling of indigenous plants and animals*
- *Lack of management of Eco-tourism*

6. Deterioration of traditional agricultural practices

- *Deterioration of terracing agriculture*
- *Increase use of agrochemicals (pesticides, fertilizers fruit ripening…etc.)*
- *Overgrazing*
- *Overexploitation of trees and shrubs for fuel consumption*
- *Deterioration of rained farming systems*
- *Slaughtering high quality animals and productive females*

7. Lack of Capacity building

- *Inadequate and shortage of facilities to carry research on some aspects of biodiversity at Agricultural research stations, Universities and other concerned institutions*
- *Inadequate of funds to carry research on biodiversity or environment protection*

8. Inadequate legislative tools and conservation measures

- *Weakness of quarantine measures at country outlets*
- *Unclear land tenure*
- *Inadequate and weak legislation for wild life protection and protection of endemic plant and animal species.*

3.3. Terrestrial Biodiversity:

The annual depletion rate of of forest areas during the period 1990-2000 was 1.04% due to a host of factors including agricultural activities, overgrazing and wooding. Statistics indicate that 60% of the population is still using wood as fuel. What is so alarming is that the vegetation cover is over depleted. Depletion exceeds tree-planting by far thus creating a serious threats to biodiversity.

The country's vegetation is being drastically reduced by rapid degradation of the environment, a direct result of desertification and droughts, among the oldest global environmental phenomena. These phenomena have increased drastically in Yemen and threaten about 90% of the land and can be attributed to the following threats:

3.3.1. Threats and constraints.

a) Cultivation and poor agricultural practices;
b) Wood cutting for firewood, timber and charcoal;
c) Over grazing;
d) Soil Salination;
E) Wind erosion and Sand dune encroachment; and
f) Construction expansion in cities and villages.

3.4. Water Resources:

Yemen is one of those few countries in the world that have an "extremely sever water scarcity problem". The total renewable water resources are estimated to be 2.1 billion m3 per annum. The country population was nearly 16 million in 1994, which means that per capita availability of renewable water resources was no more than 133m3 in that year. This does not compare favorably with overage availability of 1,250 m3 in

Middle East and North Africa region, or with the 7,500 m3 for all countries. The water use in the country was 2.8 billion m3 in 1994. Thus water consumption exceeded the annual renewable resources availability by 0.7 billion m3. This gap is probably much wider now. If the present rate of population growth were not slowed down, the country would have twice as many inhabitants by the year 2016. As a result the per capita availability of renewable water resources would become dangerously low, facing an even higher rate of depletion of groundwater storage. The situation would become much more precarious inn the central highlands where the population density is high.

In the rural area where the most of the country's population lives, the average daily per capita water consumption is only between 20-25 liters in these areas. The urban water consumption ranges from 30-70 litters / capita / day but is significantly less than the average 200 liters peer capita per day for developed countries and the global average of about 100 liters per capita per day. (NWRA, 2003).

3.4.1. Threats and constraints

-Overuse and depletion of water resources;
-Uncontrolled abstraction;
-Weakness of legislation enforcement ;

Yemen is water - scarce country with no major rivers. Ground water is the major resource of water supply for most sectors.

High temporal variation in rainfall and spatial variations add further complications to the ground depletion equation. Inadequate system for water management worsens the problem with poor legislation, inadequate restrictions on well drilling, and lack of efficient utilization of irrigation facilities. Exploitation of resources is also reflected in deforestation, desertification of land and the abound moment of terraces. The Red Sea and Gulf of Aden represent a complex and unique tropical marine ecosystem with remarkably high degree of endemism, are also in environmental threats. Notably from habitat destruction, over-exploitation, and pollution, mismanagement of fishing resulted in a large drop in fishing productions

In rural areas, Farming Technology is confined to the cultivation of Qat, while agricultural production activities elsewhere are in primitive technology.

4-Developing and Implementing Specific Policy, Legislation and Regulations Concerned with Biodiversity

4.1-Threats and Constraints

Presently there is no legislation or policies in force in Yemen, which deal specifically with biodiversity resources, and only a small number, which have provisions related to certain aspects of biodiversity conservation. However, these provide a basis on which to build a national policy and a legal regime for biodiversity conservation, but by themselves are not sufficient to comply with Yemen's will, (interest) and obligations under the Convention of Biodiversity (CBD) and its protocols.

The biodiversity related provisions in the Environmental Protection Law (EPL) No. (26) for 1995 and biodiversity related policy in the National Environmental Action Plan (1996 - 2000) are very general and will require more comprehensive and detailed policies and regulations in order to harmonize them within Yemen's Government Community and the CBD. Specific jurisdiction over the biodiversity resources of the country requires special attention due to the following constraints:

At present, administration of biological resources is centralized in the capital, Sana'a. The centralization of the government system has been an obstacle for a more regionalized or local control over natural resources by local authorities and communities. The present system does not provide them with any powers or controls in biological conservation and management. There is now a draft of a new law on local administration which would give local councils more autonomy and authority to manage biological resources locally among other things. Recent speeches on administrative, economic and financial reform by high government officials are beginning to place new emphasis on the process of decentralization and the necessity for issuing the new local government law.

The EPL has conservation and sustainable use of natural resources as one of its principal objectives. Issues concerning biological resources are included among the responsibilities to coordinate environmental protection and monitoring, and the implementation of environmental policies among all government institutions. There are sect oral laws and by-laws, however, which give similar powers over specific biological resources to other institutions.

Some of the recommendations in the National Environmental Action Plan (NEAP) incorporated into the first National Five-Year Development Plan (1996-2000), contain specific policy statements. These first steps toward integrating environmental and biodiversity concerns at the national policy level indicate that awareness of these issues within the central government is increasing. This trend is very positive and should be advanced through additional actions at the policy and legislative levels as soon as possible.

Yemen has ratified three of the five principal biodiversity-related international agreements:

- *The International Convention on Biological Diversity (CBD);*
- *The Convention on International Trade in Endangered Species of Wild Fauna and Flora CITES; and*
- *The World Heritage Convention.*
- *Ram Sar.*

International treaties have become an integral part of Yemeni law as of the date of their ratification. However, the texts of these agreements are not published in the Official Gazette, which means that they are not known or understood by administrators, lawyers and judges who must implement and enforce their provisions.

There are a number of laws in force which are elated to the protection, conservation and management of the environment. The most important of these for biodiversity conservation are:

- *Environmental Protection Law (EPL), No. 26, 1995;*
- *Law for the Prevention of Marine Pollution, No. 11, 1993;*
- *Law Regulating Fishing and Protection and Use of Living Marine Resources, No. 42, 1991;*
- *Law Livestock Protection No. 88, 1977;*
- *Law Banning Hunting of Gazelles, No. 40, 1977;*
- *Hunting Law, No. 14, 1970.*

Drafts of some laws and regulations are still under preparation. The most important are:

- *Draft Forestry Law.*
- *Draft Local Administration Law.*
- *Draft Water Resources Law.*
- *Draft Eco-tourism Law.*
- *Executive Regulation for EPC No. (26) Of 1995.*
- *Genetic Resources Use By-Law.*

Existing legislation does not cover all aspects of biological diversity and its sustainable use, and does not sufficiently implement the obligations of the biodiversity-related treaties to which Yemen is a Party. For example, provisions of the EPL and of the fishing and marine resources law regulate selected aspects of in-situ conservation, but do not deal with the full range of in-situ conservation issues. The EPL has provisions on planning, monitoring, and EIA. Provisions in laws on investment and intellectual property address the issues of technology transfer and intellectual property rights generally, but not in the context of biodiversity. Neither ex-situ conservation nor introduction of alien species, nor access to genetic resources is addressed in any existing legislation.

In order to fill these regulatory gaps, by-laws or regulations need to be issued based on the provisions of existing laws. The existing legislation does, however, set the foundation for the legal and institutional framework for biodiversity conservation and sustainable use in Yemen.

> *Principles of Islamic Shari'a cover many of the gaps and deficiencies in legislation. Many of the concepts have been codified in Yemen's statutory law. However, many other rules are widely scattered in various reference works from different religious schools, many of which are not even available in Yemen.*

The Law on Universities has provisions on scientific research and information exchange among national consultations or with other states, but there is no specific legislation mandating or enabling research on biological resources. Several faculties and research centers are involved in research on biological resources, and at least two central government institutions are building related databases, but there is little if any coordination among them.

Recently, there is increased awareness among the public and decision makers in Yemen about the threats to biological diversity in both terrestrial and marine environments, and about the legal aspects of biodiversity conservation and sustainable use. The EPL provides for environmental education and awareness programs, and subsequently the EPC in cooperation with Ministry of Education and Ministry of Information, developed principles on environmental education and public awareness.

The EPL requires EIA for all projects, establishes basic procedures for EIA, and requires environmental audits for existing activities. The EPC subsequently developed a policy on EIA procedures which has been incorporated into a draft by-law of the EPL implementing the pollution control provisions of the law. The draft by-law does not include criteria for EIA review.

Awareness is increasing about the importance of eco-tourism for the national economy and its impact on conservation and sustainable use of biodiversity. A draft law on eco-tourism has been prepared, but not ratified.

> *The existing laws on urban planning and land use and on land registration do not cover all issues related to land tenure and are not consistently enforced in all governorates.*

Community participation, as the concept is used in the CBD, is developing in Yemen, but it is not embodied in legislation. However, there is a tradition of organization at the community level; the development cooperatives that began in the 1970s are good examples of this. There is a law regulating cooperatives. The concept of NGOs is still new and the organizations that exist need to be strengthened and supported with necessary resources. There is legislation that governs citizen associations, including NGOs, generally. According to this law environmental organizations would have to be registered with the Ministry of Social Affairs.

One of the principal obstacles to implementing measures to conserve biodiversity and use biological resources sustainable is the scarcity of financial resources. The EPL provides that a resolution shall be issued by the Prime Minister establishing the Yemeni Environment Protection Fund to receive funds and allocate them to activities which promote the objectives of the EPL. There is a draft of the resolution, but it has not yet been adopted.

The EPL and other laws governing biological resources (for example, the law on protection and use of living marine resources) impose severe penalties for violations of their provisions. These penalties include fines, imprisonment, and compensation for any damage caused. However, the laws are not consistently enforced and offenders often are not prosecuted. Neither the Attorney General nor other governmental authorities have yet used Yemen's existing environmental laws to enforce conservation and sustainable use of biological resources. Fortunately, the EPL stipulates that there is no time limit on bringing suit for violations of its provisions. Since the EPL is a specific law, this provision will override any contradictory provision in any other related law. Also, the EPL provides NGOs and private individuals the right to bring a claim before a court.

The inadequate legislation still poses a threat to estimated 200 - 300 endemic birds, mammals, plants, reefs and wildlife that are known, including globally threatened species. Threat accrues because of weak enforcement of existing laws and lack of specific by-laws.

5-Environmental Impact Assessment in Yemen:

Introduction:

EIA introduced to Yemen and dedicted by Donors through the implementation of projects that funded by them.
After 1995, the EIA becomes a mandatory process

5.1-Institutional Framework:

5.1.1-Policy Responsibility

The responsible authority for EIA / SEA policy development is the Ministry of Water & Environment that was established recently according to the Republican Decree No.(105 l 2003) as part of the new Government.

5.1.2-Monitoring Responsibility:

The responsible authority for monitoring and review of the EIA studies reports for projects is the Environment Protection Authority attached to the Ministry of Water & Environment.
Both policy development and monitoring mandates require amendments in the Environment Protection Law and its executive regulations.

5.2--Legal and Regulatory Framework

5.2.1-Laws and Regulations Prevailing the Administrative Sector and Institutional Powers

Environmental Impact Assessment EIA is regulated in Yemen by two types of EIA concerned legislations. Environmental Protection Legislation and related ***Specific****/ sect oral legislations.*

5.2.1.1- Environmental Legislations:

The Environment Protection Law No. (26) For 1995 is the umbrella for environmental issues in general and for the EIA in particular. Section three of the law (articles35-47) is dealing with environmental assessment for the new and old development and investment projects.

The executive regulations (Cabinet Decree No.148 for 2000) are consisting of EIA guidelines and projects categories that require EIA.

The Environmental Protection Law No. (26) For 1995 (EPL) and its executive regulations approved by Cabinet Decree No. 148 for 2000. Chapter 3 of the environmental law contains articles and provisions for enacting of legislation on the requirement of EIA in project development. The regulation includes projects categories, which requires EIA, but it is not addressing any EIA procedures such as scoping. According to the EPL and its regulation, all infrastructure, urban development projects, waste collection and disposal require an EIA (i.e. water supply, wastewater treatment plant). An extension of an existing treatment plant is not listed under these requirements.

Table (1) Key Articles of EPL addressing EIA requirements

Articles	***Issues***	***EPL Text***
35 – 36	*Project Licensing*	*It is not permissible for any competent body to give permission or issue a license to establish or operate or amend projects that affect and damage the environment or contribute to its degradation or pollution or contribute in occurring such effect or harmful to human health or other living organisms, only in accordance with standards and criteria determined by EPC*
37-1 *37-2*	*Definition of EIA guidelines & standards*	*For the purpose of the EIA, the cabinet shall issue a decree for the determination of the standards, criteria's, guidelines and procedures through which to a certain and find out whether such proposed project affects sustainability of the environment or not. The decree referred to in Paragraph (1) of this article shall determine the elements that shall compose the statement and study of the environment impact assessment shall include:* *A- Description of the proposed activity* *B-Description of the environment that potentially might be Affected.* *C-Description of alternatives to proposed project.*

		D-Evaluation and assessment of the potential environmental impact and effects. *E-The extent to which areas outside the national sovereignty may be affected by the proposed activity.*
Article 4 – chapter 2- Exec. Reg. EPL. *-Annex 1-6 (Exec. Reg.)* *Annex 1–7 (Exec. Reg.)*	*The projects that require EIA* *List of Urban Projects that requires EIA* *Collection & disposal of waste*	*All projects, activities, expansion or renewable listed in annex 1 of this regulation are subject to EIA.* *Water supply and sewerage systems* *Wastewater treatment plants.*

With respect to urban projects, industrial, power projects, agriculture, irrigation, water resources and sanitation projects, the EPL and its executive regulation is relevant with some gaps.

Both, the law and regulations states:

- ***What activities require an EIA,***
- ***Who should execute the EIA,***
- ***Who should follow the implementation of EIA guidelines,***
- ***Who should review and evaluate the EIA reports,***

Although the above EIA issues are stated in the EPL, the EIA guidelines and regulation are required to define clearly unequivocally rights and obligations of the investing party, the governmental authorities and the general public. Before starting any activity, investors should be provided with a clear picture of what procedure to follow and what authorities to deal with. Authorities should know what responsibility they have in this respect, and the general public should have the right to appeal the authorities on the basis of this responsibility. In addition, they should state clearly the following issues:

- ***What are the required procedures and system to be followed,***
- ***Who should monitor the implementation of EIA recommendations and environmental plan,***
- ***What sanctions can be imposed in case of non-compliance.***

5.2.2.2- Specific / Sect oral Legislations:

Furthermore, the law for water, the law for investment and the law for cleanliness are addressing the EIA for the projects.
The EIA is required according to Water Law No. (33) For 2002(Chapter three, article 56), Urban Planning Law and Investment Law No. ( ) for 2001, or sect oral laws such as Oil & mineral exploitation law No. ( ) for 199 and the Cleanliness law no. ( ) for 1999.
EIA is primarily project based. EIA is mandatory for those projects that do not meet the environmental quality standards as developed by the different authorities under responsibility of the EPC and established by the Cabinet resolution (Art. 37, 1)

5.2.3-Activities requiring an EIA:

EIA guidelines within the framework of executive regulation of EPL list a number of development activities, which be eligible for EIA. Some examples from this list are:

- *Activities which could affect areas of high conservation value, including mountain areas, wetlands, wadis, coastlands, coral reef or coral islands, estuaries of lagoons, area with unique flora and fauna and those containing rare or protected species.*
- *Activities which involve the selection of areas for special development, e.g. major industrial or commercial centres, new towns and suburbs;*
- *Activities which involve major engineering works such as transmission lines, pipelines, major roads and railways, airports, ports, irrigation and drainage systems, and those that involve changes to wadis;*
- *Activities which involve ceramic works in which more than 2000 tons/year of products such as bricks, tiles, pipes, pottery goods, refractoriness, or glass are manufactured.*

In the EIA by-law it is clearly stated:

- *Which areas are considered of high value, requiring a (preliminary) EIA for any activity in that area;*
- *Which activities are considered potentially harmful to the environment and therefore requiring and EIA;*
- *Below what capacity or size the requirement for an EIA for any particular activity can be dispensed with.*

EIA should also be obligatory for existing facilities with plans for major expansions (e.g. 25% of capacity), if a new facility of this kind would be eligible for EIA. ***EIA***

5.2.4-Procedure and system:

In the existing regulations, there are no specific EIA procedures that to be followed by investor, developer or beneficiary institution. The compliance with EIA procedures is subjected to the following:
-the type of the project;
-the financed agency;
-the conditions of the donor or sponsorship;
-the compliance to/ / understanding of the environmental regulations from the client ministry.
Therefore, the former EPC applied the following procedures in some of the projects mainly financed by the international donors or by oil companies:

Procedures	*Description*	*Leading Agency*

Submission of the project proposal	*Deciding whether the project requires an EIA*	*The MWE/ EPA ,Concerned Ministry,Developer,Dunor or Investor*
Scoping and TOR	*Developing a term of reference for the EIA study and approval of TOR.*	*TheMWE/EPA,Conncerned Ministry,Developer,Dunor or Investor*
Conducting the EIA	*Usually the private consultancy firm carry out the EIA study with participation of environmental authority, concerned ministries and developer or donor, following the guidelines provided by the Environmental Authority. The investor covers the costs.*	*-Private Consultancy Firm;* *-Concerned agencies.*
General Consultation	*The Private Consultancy Firm organizes a workshop or meeting in coordination with Environmental authority developer, donor to consult relevant government institutions and local communities.*	*The Consultancy Firms, Ministry of Water &Environmnet,Conncerned Ministry and*
Reviewing of EIA Report	*The MWE/EPA, Environmental Authority reviewing the EIA report. The reviewing may carry out with assistance of professionals from university or other institutions. No fees are required except the cost of hiring consultants.*	*MWE / EPA and Concerned Ministry and developer.*
Final consultation	*After submission of the EIA final draft the Environmental Authority consults the parties who responded to the general consultation for comments on the EIA (see above).*	*-Environmental Authority;* *-Concerned Ministries.*
Evaluation	*The Environmental authority evaluates the EIA, taking into account the comments received, the evaluation will result in acceptance or rejection of the EIA.*	*Environmental Authority*
Final decision and Environmental clearance	*The Environmental Authority decides if, or under what conditions, the proposed activity is environmentally acceptable. Accordingly the MoWE issue clearance letter which may include conditions and mitigating measures (changes in design or location), to monitoring requirements or to requirements for operation and maintenance.*	*Environmental Authority Ministry of Water & Environmental*

5.5.5-Gaps and Driving Forces Affecting the Integration of Environmental Impact Assessment into Conservation of Biodiversity in Yemen:

The following gaps affect the elaboration and implementation of EIA.

1/a gap in legal frameworks
The Yemen Environmental Protection Law was passed in 1995 and the by-laws were issued by the Cabinet in 2000, but still there are gaps in the procedures and enforcement mechanisms are yet to be developed. There is also lack of legal framework on which to base all activities for the conservation and sustainable use of biodiversity in Yemen.

2/a gap in Human Resources *and Capacity Building:*
There are presently very few biologists in Yemen, especially marine and wildlife biologists, taxonomists, oceanographers, conservation managers and very few specialists in environmental assessment. There is also a need for experienced human resources who can implement collaborative management with community based programs. Capacity building for national consultancy firms, training courses for university professors, graduate students and community groups in environmental assessment, species identification, and scientific wildlife data collecting, social and economic aspects related to the conservation and sustainable use of biodiversity in Yemen is priority number one.

3/a gap in information
This relates to information and documentation on biodiversity in Yemen. The data collected were largely based on available information at the national level. A more exacting scientific approach is needed for monitoring and assessment purposes.

4/a lack of coordination among stakeholder agencies in Biodiversity.
Since there is no one agency, which is responsible for biodiversity in the country, different line minister is complain of the overlapping of their man date. It is necessary that BD affair most be exerted to one agency, that would have the responsibility of coordination and implementation of certain useful environmental issues.

5/Inadequate awareness and commitment to Biodiversity.
There is a clear shortage of awareness and commitment to environmental issues, especially those related to environmental assessment, conservation and sustainable use of natural resources in Yemen. In the future educational curriculum must emphasize on environmental courses. In addition, communities must be educated in the issue of BD and they should have the opportunity to get involved in the assessment and management of the natural resources and protected areas
It is hoped also that this legislation once prepared can be incorporated and implemented in biodiversity conservation areas.

5.2.6-Guiding Principles for Integration of EIA into Biodiversity Conservation

-General Considerations

The Yemenis recognize that:

- *Biodiversity is a key component of our cultural heritage. Yemen is famous for its terrace, which constitute as one of the optimal soil and water management system.*
- *EIA is the key issue for sustainability of natural resources and better decision making for biodiversity conservation.*
- *Yemen is concern with protection of environment and conservation of biodiversity for several reasons :*
  - *-Sustain the policy, plans and projects;*
  - *-Improve the decision making in early stage;*
  - *-Protect the environment and maintain ecological balance;*
  - *-Conserve natural resources and sustainability usage.*

- Specific Considerations:

Yemen considers the integration of EIA approaches into the conservation of biodiversity and the sustainable development of resources for reasons which include:

- *Continuous assessment of the biodiversity situation;*
- *Identification of mitigation measurement and actions for BD conservation*
- *Ensuing the best use of biodiversity elements;*
- *Maintaining ecological balances in the productive ecosystems so as to avoid ecological imbalance and incidence of new pests;*
- *Protect elements of biodiversity resources against dangers of deterioration as loss;*
- *Protect elements of BD as part of our cultural heritage.*

Yemen is also concerned with number of important issues related to biodiversity conservation, and sustainable use of natural resources like the issue of bio-engineered organisms and it's economic, ethical and legal aspects. This is the issue of bio-safety, and a Biosafety Regulation and Guidelines for Yemen is not yet formed.

5.2.7-Guiding Principles:

In the light of those considerations, the following guiding principles relevant to the integration of environmental assessment into the BD conservation:

- *Elements of BD have ecological and economic values and are among the foundations for sustainable development*
- *Conservation of BD is a tool for development of natural resources at present and in the future and should be a part of integrated National Plans for sustainable development.*

- *The consideration of environmental assessment as the important tool for giving effect to sustainable development objectives in planning and decision making;*
- *The role of scope and integrity of the EA process whether BD policy , action plan or projects to be included;*
- *The larger mix of environment and economic policy or reform program and planning instruments that are used for decision making to be considered ;*
- *The degree to which there is a policy commitment to sustainable development as demonstrated by strategies or action plans and measures to be implemen6ted;*
- *Action Plans for conservation of BD and sustainable of its resource should be set for the benefit of all Yemenis, and be implemented through their participation. The sustainable use of Yemeni BD means that the benefit shall be shared equitably and fairly among all Yemen people.*
- *Collaborative Management of Biotic Natural Resources, the traditional knowledge of the Yemeni people must be supported, protected and utilized as a rich heritage.*

5.2.8-Learning-by- doing:

The integration of BD conservation into environmental impact assessment requires a process of "Learning – by – doing "adequate assessment and monitoring of evaluation method must be built into every action or project implemented.
This will ensure that they are vivid and constructive analysis – and – action cycles mutually feeding and enriching each other.

5.2.9- ***Learning Lesson:***

During the last five years , several EIA studies had been conducted for water, sanitation, dams ,high ways, free zone and seaport projects. I believe that The BD considerarions in those case studies were moderate.
The following lessons which have learned from the implementation of EIA:

-The enforcement of EIA process could be implemented gradually.
-The EIA is a good planning tool to conserve the BD.
-The application of EIA requires skills, professional experience to implement and evaluate the study reports.
-The integration of BD consideration into EIA will lead to positive impact on environment, social and economy.
-Training is very important factor for all technical staff levels involved in the EIA processes.
-Clear legal framework guidelines and regulations EIA is essential basis towards implementation EIA.
- Awareness rising among the decision makers and public should be part of the EIA implementation program.
-Community participation in the EIA process has advantage to select alternative and construction of projects.